Puget Sound Water Quality and Agriculture

Presentation to
the U.S. EPA Farm, Ranch, and Rural Communities Committee

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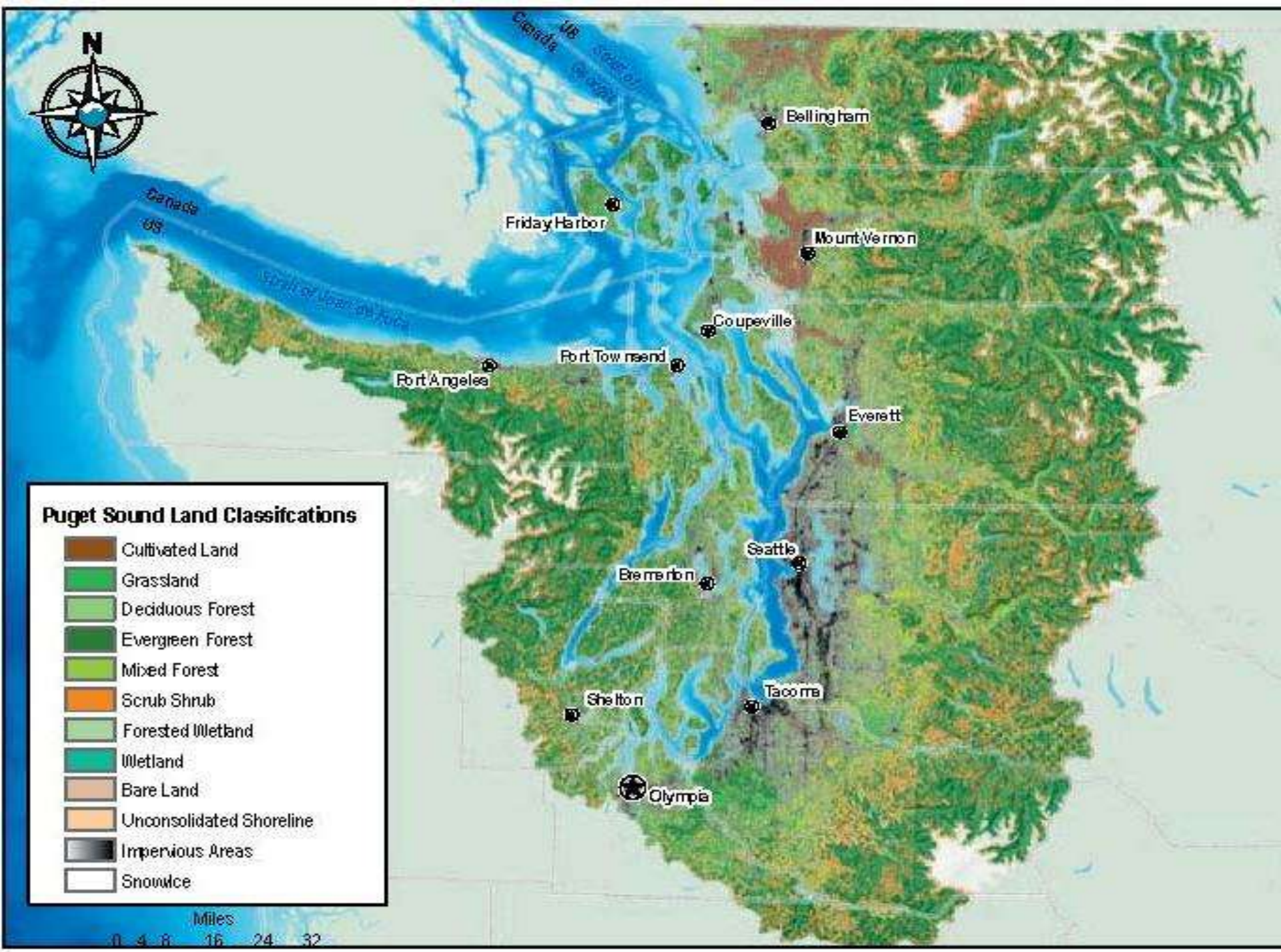
Washington State Conservation Commission

Presentation Outline

- Orientation to Puget Sound
- Agriculture in the Puget Sound Basin
- Challenges
- Opportunities
- Case Studies
- Moving Forward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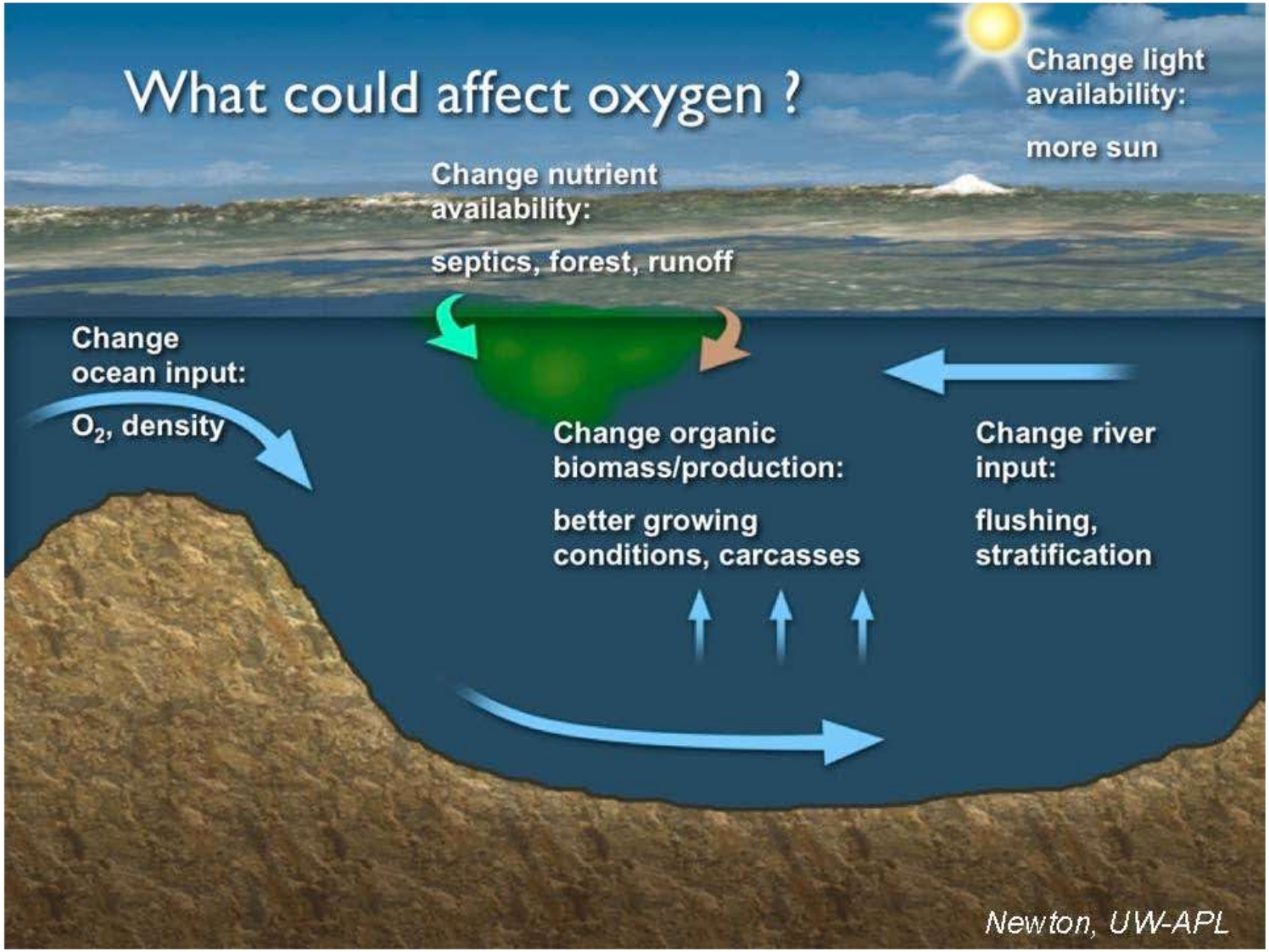
Canada
US
Strait of Juan de Fuca
Bellingham
Friday Harbor
Mount Vernon
Coupeville
Port Townsend
Port Angeles
Everett
Seattle
Bremerton
Shelton
Tacoma
Olympia
Puget Sound Land Classifcations
Cultivated Land
Grassland
Deciduous Forest
Evergreen Forest
Mixed Forest
Scrub Shrub
Forested Wetland
Wetland
Bare Land
Unconsolidated Shoreline
Impervious Areas
Snow/ice
Miles
0 4 8 16 24 32


What could affect oxygen ?
Change light availability:
more sun
Change nutrient availability:
septics, forest, runoff
Change ocean input:
O_2, density
Change organic biomass/production:
better growing conditions, carcasses
Change river input:
flushing, stratification
Newton, UW-APL

Background - Habitats

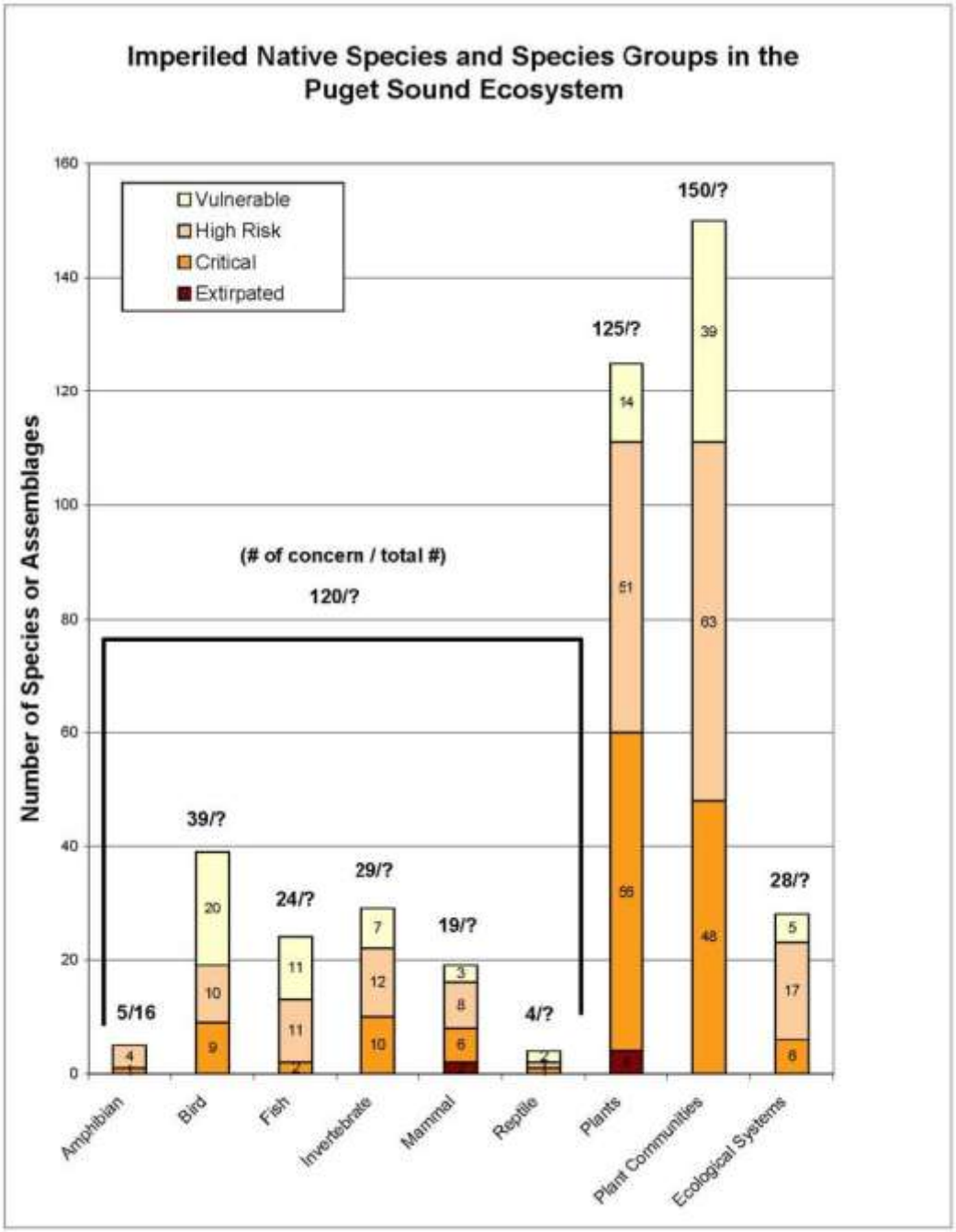
- Eight major habitats occur in Puget Sound; kelps beds and eelgrass meadows cover the largest area.
- Other major habitats include estuaries, intertidal wetlands, mudflats and sandflats.
- Upland habitats include the forest zone covering 61% of the area.
- Other key upland habitat types include floodplains and prairies.

Background - Species

Scientists have identified about 221 species of fish in Puget Sound and about 66,000 marine birds breed in or near the Sound.

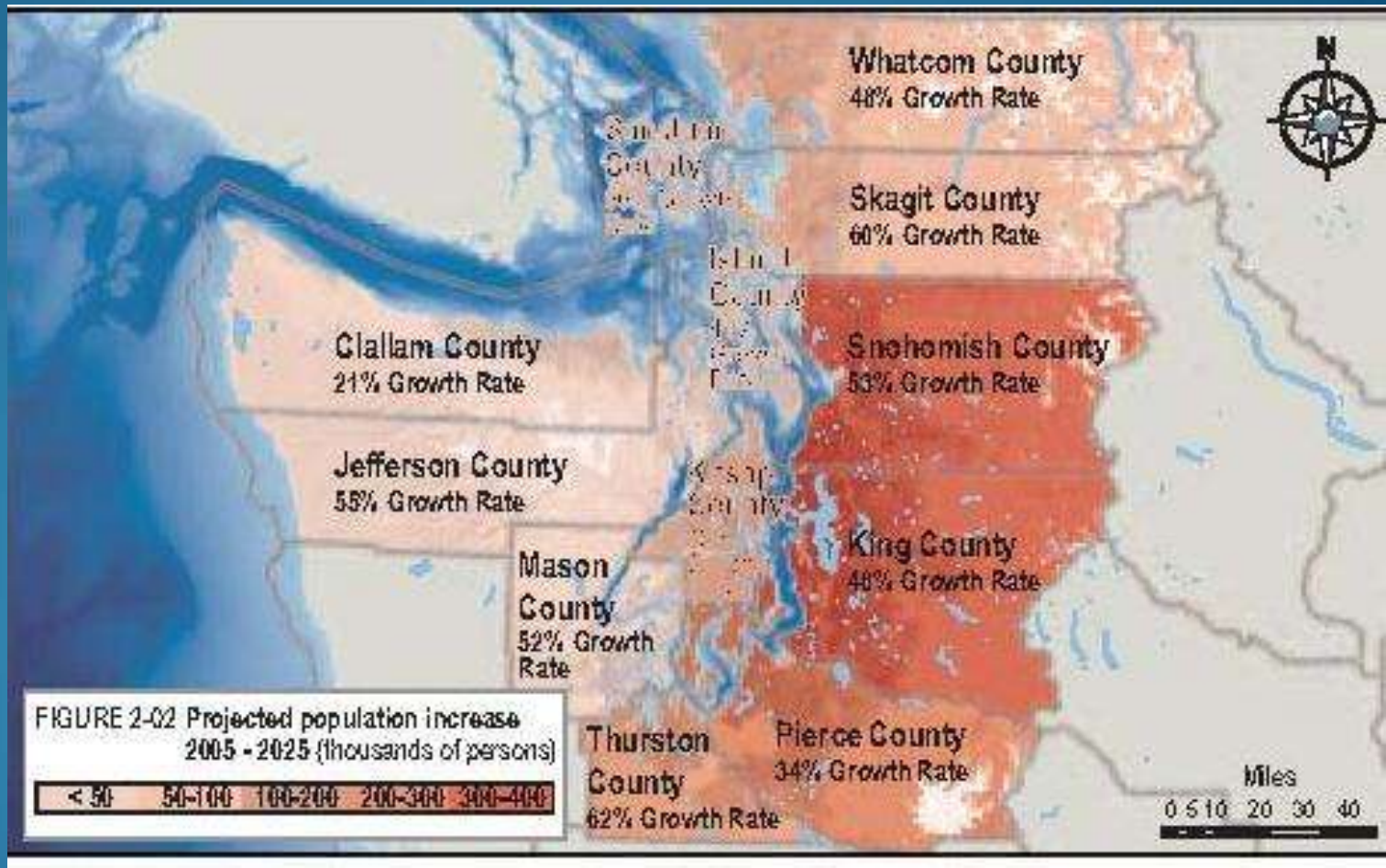
Several Pacific salmon species utilize Puget Sound, including chinook, coho, chum, pink, and sockeye salmon. Anadromous steelhead and cutthroat trout also utilize Puget Sound habitats.

Nine primary marine mammal species occur in Puget Sound including: harbor seal, California sea lion, Steller sea lion, Northern elephant seal, harbor porpoise, Dall's porpoise, killer whale, gray whale, and minke whale.


Imperiled Native Species and Species Groups in the Puget Sound Ecosystem
Number of Species or Assemblages
Vulnerable
High Risk
Critical
Extirpated
(# of concern / total #)
120/?
5/16
39/?
24/?
29/?
19/?
4/?
125/?
150/?
28/?
Amphibian
Bird
Fish
Invertebrate
Mammal
Reptile
Plants
Plant Communities
Ecological Systems

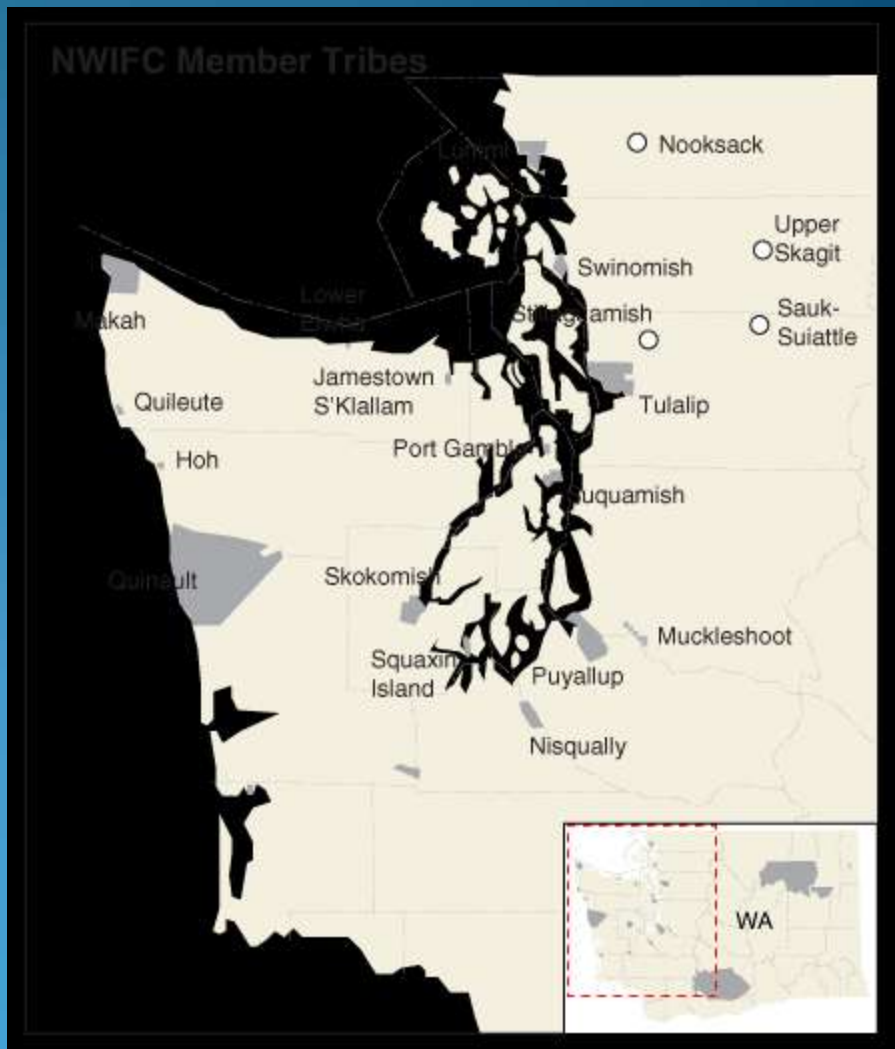
Population

- Puget Sound population has doubled from 2 million to 4 million since 1960 and is projected to reach 5.4 million by 2025.



Tribes

- 14 Tribes in Puget Sound.
- Co-managers in natural resources.
- Major Issues:
  - Salmon recovery
  - Shellfish
  - Water rights
  - PS fisheries



Agriculture in the Puget Sound Basin

- In the 12 counties in the Puget Sound Basin, there are:
- 11,501 farms totaling 580,000 acres.
- All counties have seen an increase in the number of farms since 2002.
- Puget Sound agriculture has an economic value of over $1 billion, including processing value.
- Farm animals in the Puget Sound Basin:
  - Cattle and Calves 243,471
  - Dairy Cows 127,847
  - Chickens 2,370,000
  - Horses 26,232

Key economic facts on Washington Agriculture:

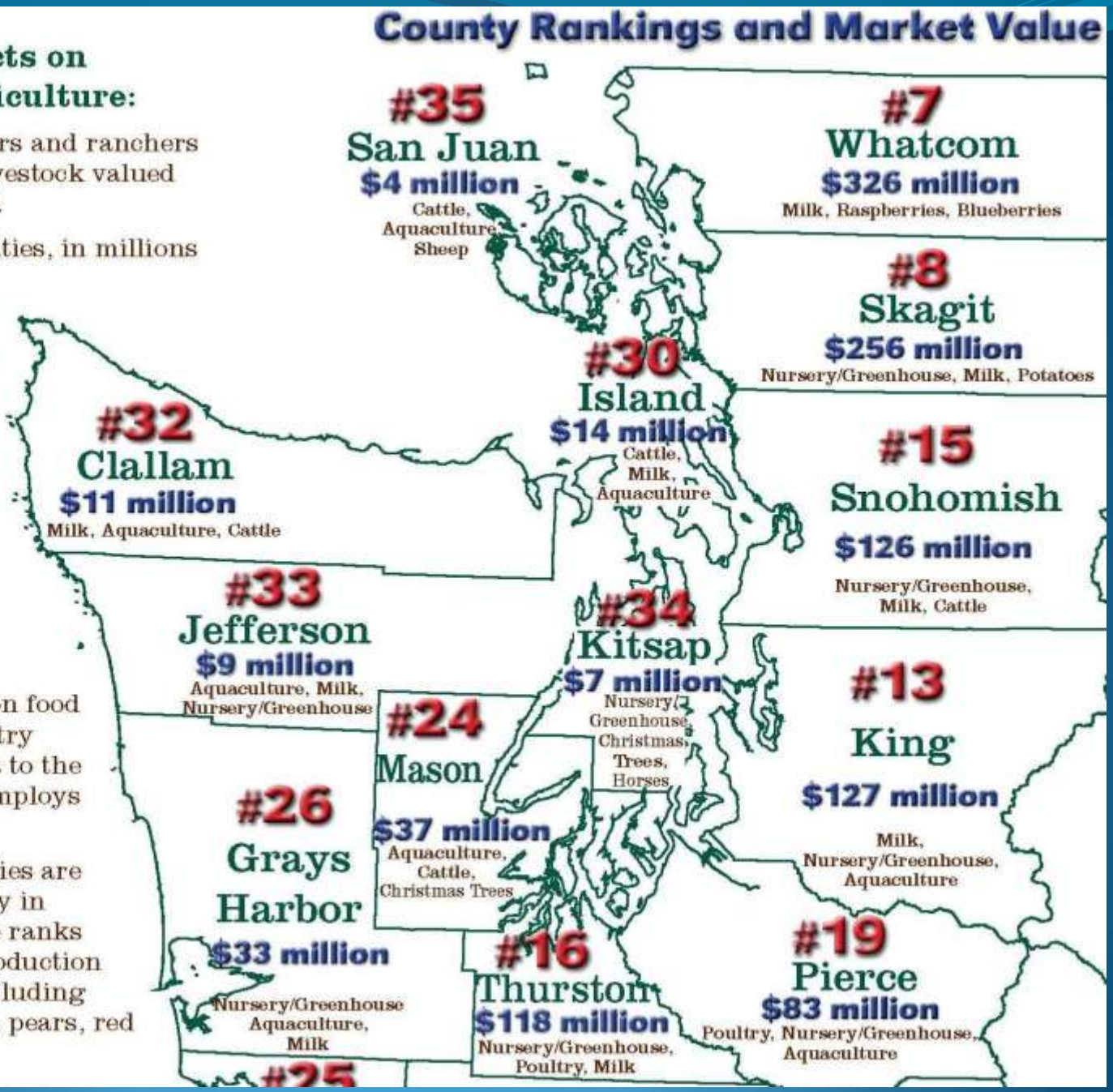
Washington's farmers and ranchers produced crops and livestock valued at $7.7 billion in 2008.

The top 10 commodities, in millions of dollars, were:

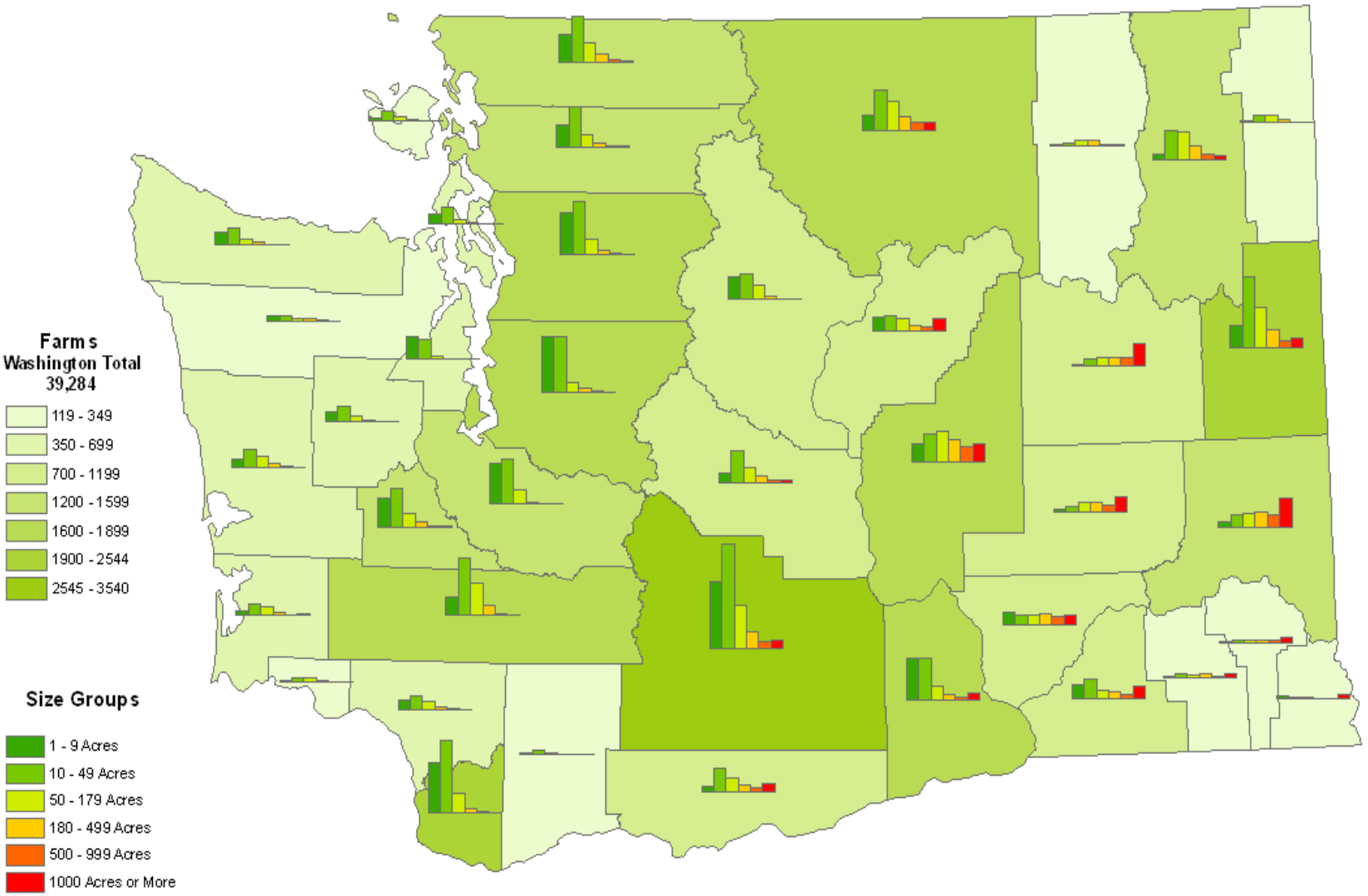
Apples	$1,283
Milk	$1,002
Wheat	$745
Potatoes	$693
Hay	$588
Cattle	$496
Nursery/ Greenhouse	$321
Cherries	$297
Hops	$253
Grapes	$201

The state's $38 billion food and agriculture industry contributes 12 percent to the state's economy and employs 160,000 people.

Some 300 commodities are produced commercially in Washington. The state ranks first in the U.S. for production of 10 commodities, including apples, sweet cherries, pears, red raspberries and hops.



Farms and Farms by Size, 2007



2007 Census of Agriculture
USDA, National Agricultural Statistics Service

Agriculture Impacts

Inputs of nutrients and pathogens affect ecosystem functions, the health and habitat of aquatic species, including economically important species (such as salmon and shellfish), and human health.

As a general rule, phosphorus tends to be the limiting nutrient in freshwater systems, and nitrogen tends to be the limiting nutrient in marine systems. This means that increased loadings of these nutrients can have significant effects on the character and condition of these respective systems.

Pathogen pollution is an equally significant water quality problem in the Puget Sound Basin. Pathogens are disease-causing microorganisms that include a variety of protozoa, bacteria, and viruses. Some pathogens occur naturally in the marine environment. Most, however, are carried by host organisms and are associated with human and animals feces

Water Quality Impacts

- There are 535 monitoring sites within Puget Sound and Puget Sound watersheds that are impaired for dissolved oxygen.
- Nutrients sources include drainage from agricultural, forestry, and residential activities and other sources.
    - Freshwater sites – 432
    - Marine sites – 103

- 913 monitoring sites within the Puget Sound and Puget Sound watersheds exceed the water quality standard for fecal coliform bacteria.
    - Freshwater sites – 769
    - Marine sites - 144

Challenges

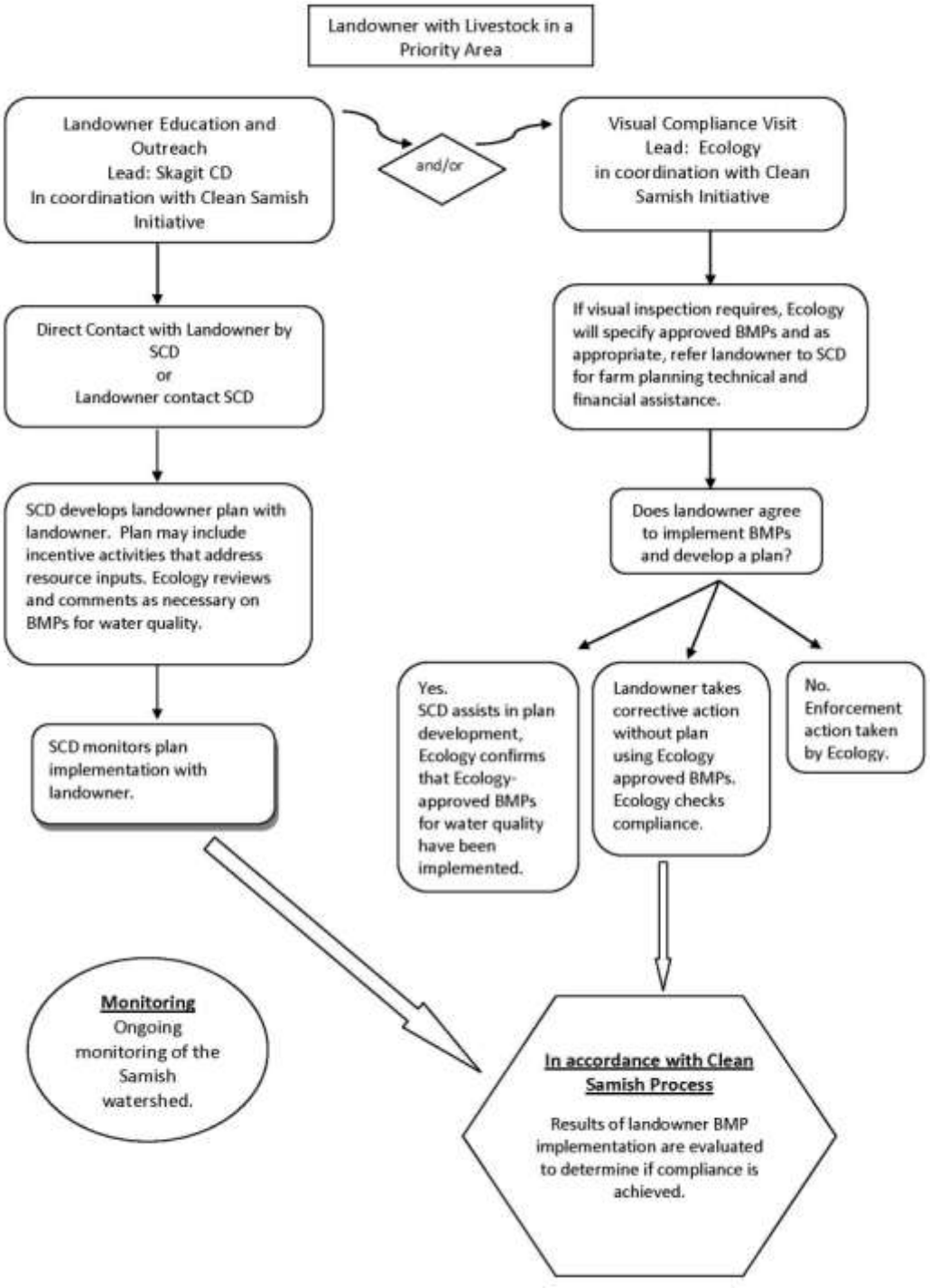
1. Tension between regulatory approach and voluntary incentive-based system. Assurances vs. implementation.
2. Growth management – requirements to protect critical areas while retaining ability to have viable, productive agriculture.
3. Growth pressures and economy – land near urban areas becomes more valuable for development than ag production.
4. Multiple governmental entities, including federal, state, local, tribal. Strong stakeholder groups in all sides of the issue. Lack of trust.
5. Reduced budgets limit traditional responses, such as acquisition, incentive programs.
6. Mitigation on agricultural lands – salmon habitat, mitigation banking.

Opportunities

1. Reduced budgets make collaboration a more attractive option. Agencies with limited resources work together.
2. Shift focus to resource outcomes.
3. Process where an entity of multi-jurisdictional and stakeholder groups oversees the response strategy.
4. Key is to have accountability for result and adaptively manage.
5. Key question….who does the accountability?

Case Study – Samish River and Bay

1. Small river basin flowing through heavy ag area.
2. Poor water quality due to fecals. Sources include septic systems, stormwater runoff, agriculture.
3. Samish Bay shellfish closures.
4. Agriculture sources include livestock, horses, crops.
5. Process: Clean Samish Initiative - CSI
6. Established by Ecology to implement TMDL.
7. Includes local stakeholders and agencies.
8. Monitoring and identify “hot spots”
9. Issue: Relationship between incentive approach and regulatory.


Landowner with Livestock in a Priority Area
Landowner Education and Outreach
Lead: Skagit CD
In coordination with Clean Samish Initiative
and/or
Visual Compliance Visit
Lead: Ecology
in coordination with Clean Samish Initiative
Direct Contact with Landowner by SCD
or
Landowner contact SCD
If visual inspection requires, Ecology will specify approved BMPs and as appropriate, refer landowner to SCD for farm planning technical and financial assistance.
SCD develops landowner plan with landowner. Plan may include incentive activities that address resource inputs. Ecology reviews and comments as necessary on BMPs for water quality.
Does landowner agree to implement BMPs and develop a plan?
Yes.
SCD assists in plan development, Ecology confirms that Ecology-approved BMPs for water quality have been implemented.
Landowner takes corrective action without plan using Ecology approved BMPs. Ecology checks compliance.
No.
Enforcement action taken by Ecology.
SCD monitors plan implementation with landowner.
Monitoring
Ongoing monitoring of the Samish watershed.
In accordance with Clean Samish Process
Results of landowner BMP implementation are evaluated to determine if compliance is achieved.

Case Study - Puget Sound Partnership

1. Independent state agency established in 2007.
2. Purpose is to craft NEP Comprehensive Plan – the 2020 Action Agenda.
3. Improve linkage of activities to identified threats.
4. Link funding at all levels to the actions.
5. Track progress and adaptively manage the plan.
6. GMAP – Government Management Accountability and Performance Program. Governor led panel.
7. Accountability – actions compared to results leading to changes.

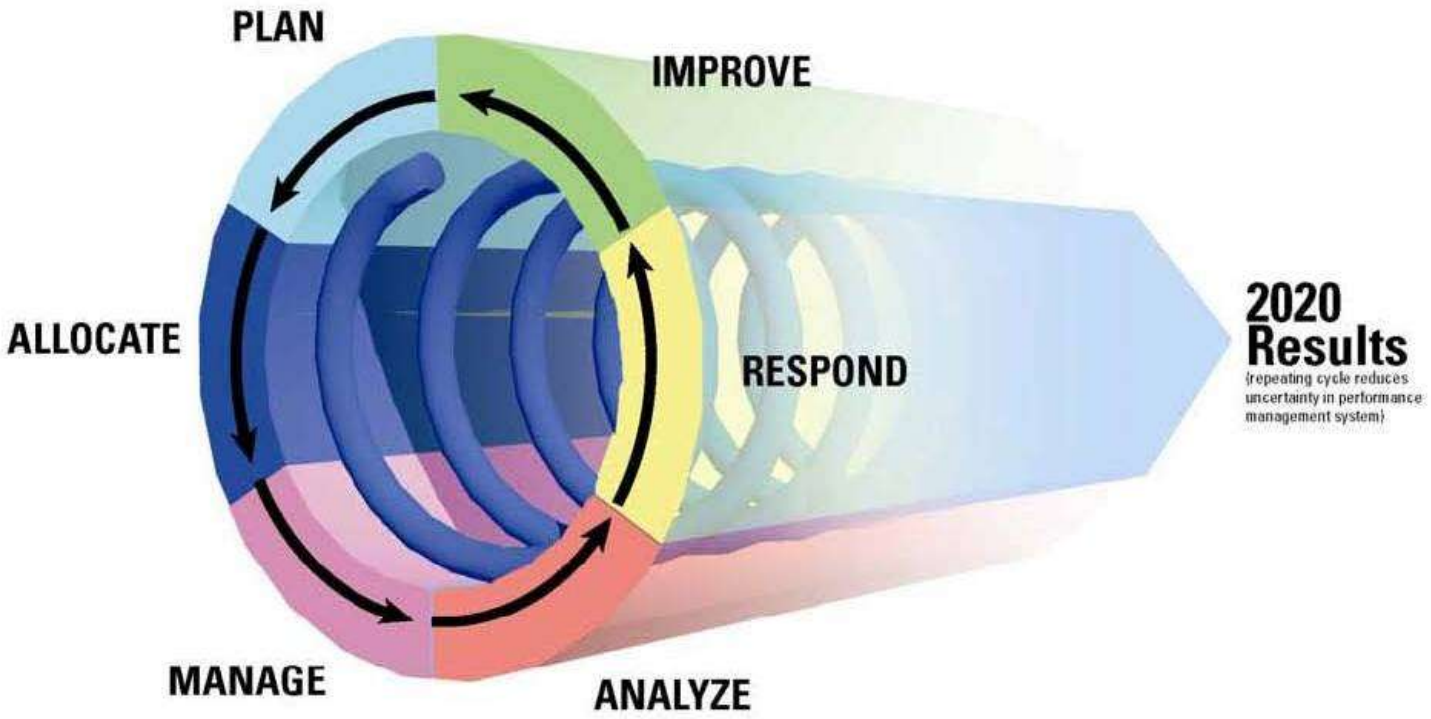
Performance Management Framework

Plan

- Articulate clear goals for ecosystem recovery
- Select a few priorities
- Analyze and rank threats
- Assess capacities of implementers
- Set performance measures at all levels
- Identify uncertainty to inform research/monitoring priorities
- select status indicators

Allocate Resources

- Reflect the priorities in budgets
- Partnership ranking of agency budget requests
- Fund monitoring with actions
- Align with science based strategies that impact ecosystem goals
- Partnership sets meaningful targets for the performance measures with implementers



Manage

- Set clear expectations for Partnership and implementers
- Engage implementers in better ways of working together
- Manage day-to-day operations
- Work the Action Agenda

Analyze

- Collect data that drive decisions
- Analyze the data from multiple perspectives
- Create action-oriented reports
- Seek citizen and implementer feedback
- Engage the Leadership Council, Ecosystem Coordination Board, and Science Panel

Respond

- Make decisions and take action
- During sessions with the Leadership Council, ask:
- Are we where we thought we would be?
- Why or why not?
- Do we need to change our strategies or recalibrate our targets?
- What actions need to be taken?
- What is the story to be told?

Improve

- Take action promptly
- Use process improvement tools
- Seek best practices
- Collaborate in new ways
- Use technology
- Adjust Action Agenda, strategies, or targets as needed

Case Study – Whatcom Dairy Management

1. Addressing resource inputs from dairy operations.
2. State program using local conservation district to work with dairy operators to develop and implement dairy management plans.

1998 Dairy Nutrient Management Act

- Goal -- Zero Discharge of Pollutants
- Management Plan by 7/31/2002
- All Dairies Implement the Plan by 12/31/2003
- Compliance: Pro-active Inspection, Referral & Fine

Technical Assistance Provided

Plan Development

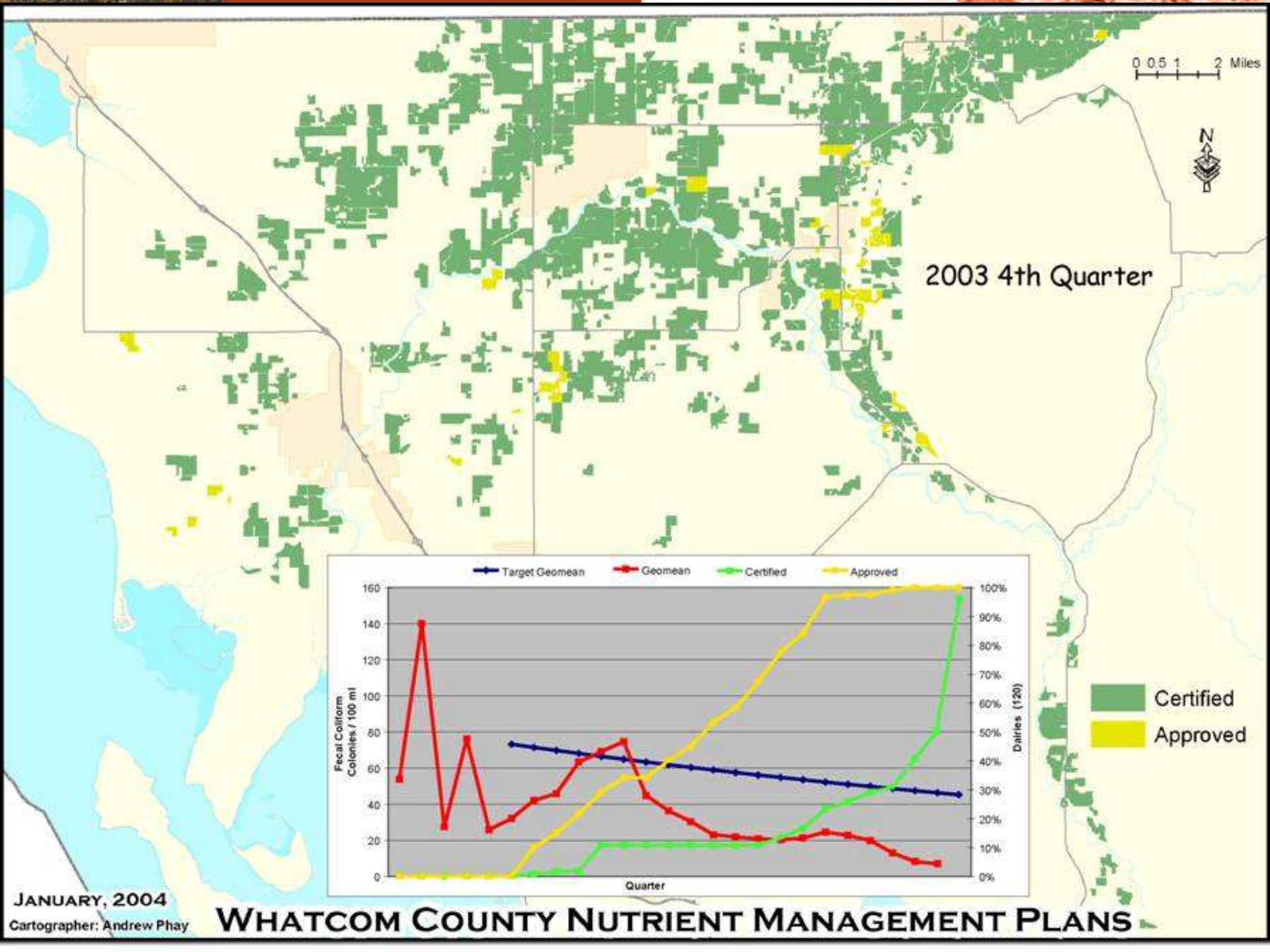
- Structure Design
- Vegetative Practices
- Nutrient Management Practices

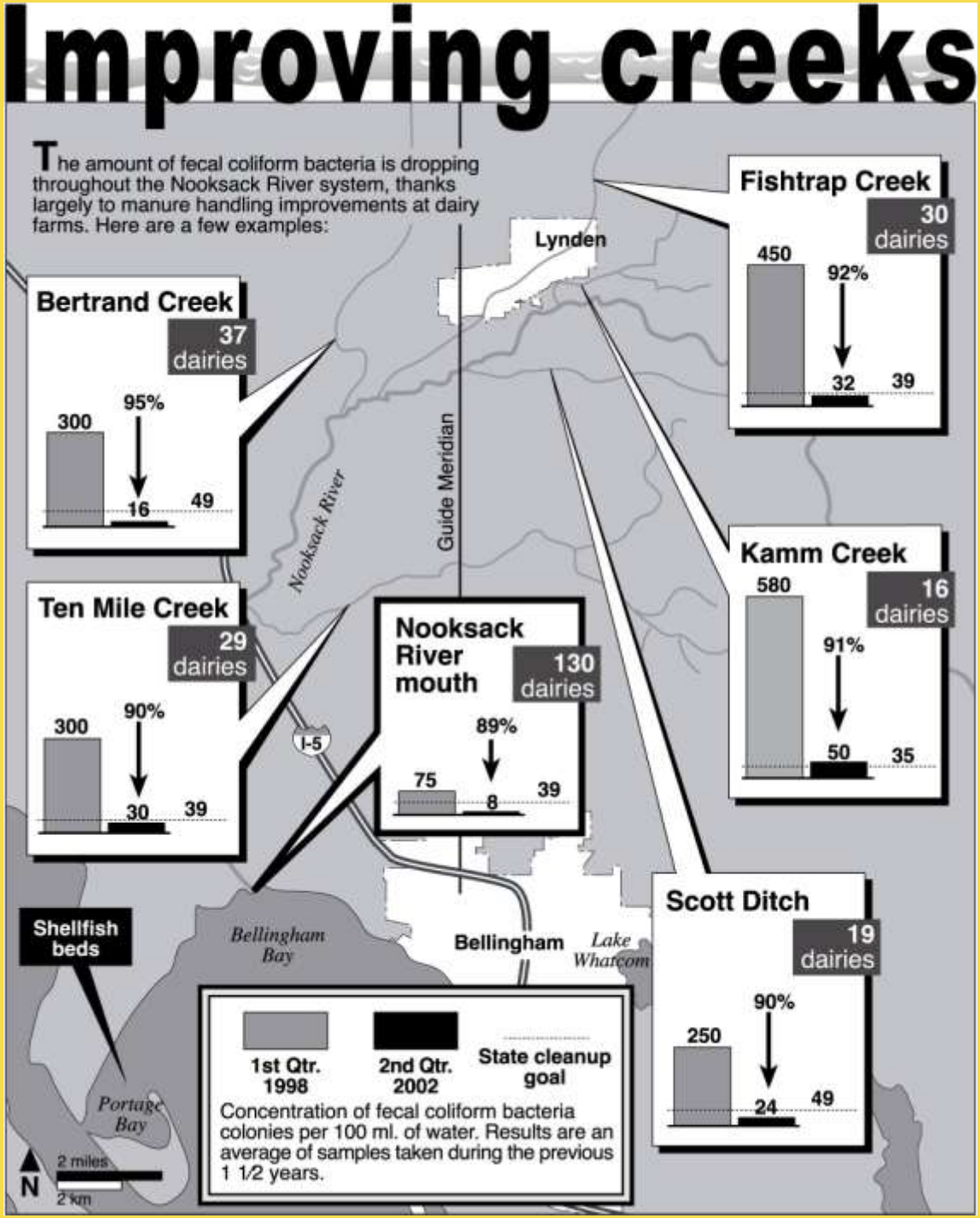
Plan Implementation

- One on One
- General

Producer, State & Federal Contributions

CD	NRCS	Farmers
4 ftes x 6 yrs	4 ftes x 7 yrs	>250 Farms
$1.1 Million	$2.7 Million	$1.3 Million
~ 54, 000 acres implementing BMPs		
~ 400 miles of buffered watercourse		
> 2,100 acres in grass buffer strips		


0 0.5 1 2 Miles
N
2003 4th Quarter
Target Geomean
Geomean
Certified
Approved
Fecal Coliform Colonies / 100 ml
Dairies (120)
Quarter
0
20
40
60
80
100
120
140
160
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Certified
Approved
JANUARY, 2004
Cartographer: Andrew Phay
WHATCOM COUNTY NUTRIENT MANAGEMENT PLANS



Bellingham Herald

CREP Implementation

2010 annual report of CREP accomplishments:

- 916 total contracts, including 9 for the new hedgerow practice and 2 for the new wetland enhancement practice.
- 12,976 acres of riparian habitat restored and protected.
- 740 miles of stream buffered by CREP.
- The plants are growing about 11-29" per year with a median survival of 91-93%.
- 4-8 year old plants already provide shade over 66% of the stream surface (small streams).

CREP buffer along Kamm Creek, which flows into the Nooksack River.

Moving Forward

- Limited resources at all levels will require targeted approaches and coordination.
- Targeted approaches need to:
  - Identify source problems with independent science.
  - All involved need to accept the process and outcomes. TFW example.
  - Must utilize an incentive-based system with a regulatory system. Use conservation district landowner relationships.
  - Focus on results – implementation and resource improvements.
  - Find ways to leverage limited resources.
  - Utilize economic drivers for ag landowners. Includes all farm sizes and types. Goal is to keep land in production.

Contact Information:

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