

WATERSHED ASSESSMENT OF TRYON CREEK

Presented by Danielle Goodrich



TRYON CREEK
WATERSHED COUNCIL



Portland State
UNIVERSITY

PRESENTATION LIST OF COMPONENTS

- Introduce the watershed assessment
- Discuss the importance of a watershed assessment
- Discuss why the state values an assessment
- Review the goals in application to Tryon Creek
- Introduce the sections of the assessment
- Review the purpose of each section
- Summarize the major findings of each section
- Discuss restoration and stewardship priorities

PARTNER ORGANIZATION – TRYON CREEK WATERSHED COUNCIL

- 1994 - started by a small group of citizens
- Today – 501(c)(3) organization with an involved board and over 400 volunteers
- Emphasis on restoration and protection efforts throughout the watershed
- Approach to stewardship is watershed-wide, acknowledging the interactions of terrestrial and stream ecosystem health



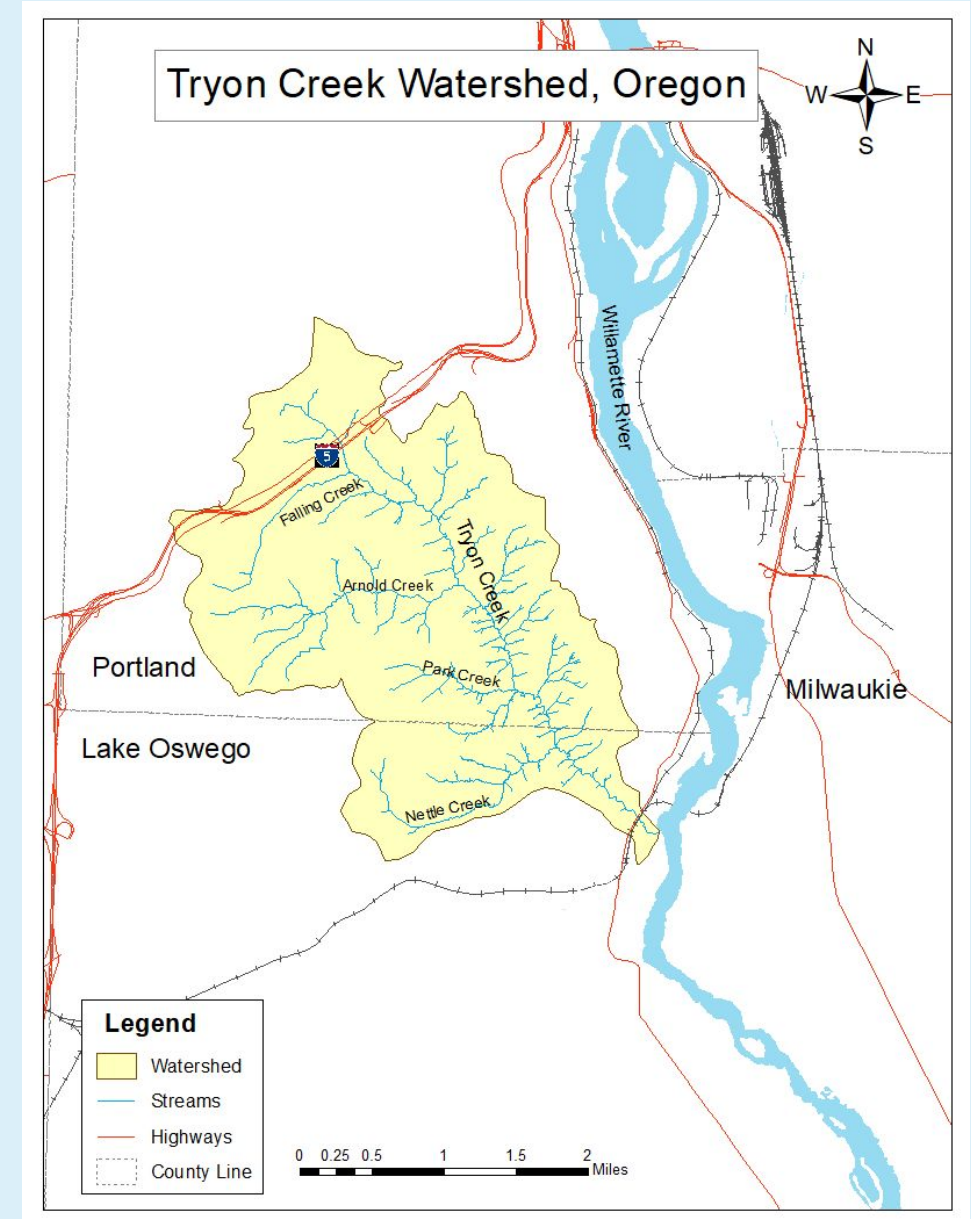
**TRYON CREEK
WATERSHED COUNCIL**



Source: Tryon Creek Watershed Council

TRYON CREEK WATERSHED

- Stream length: approximately **seven miles**
- Land area: approximately **4,200 acres**
- Cities: **Portland** (Multnomah County) and **Lake Oswego** (Clackamas County)
- Tryon Creek State Natural Area (Oregon Parks and Recreation Department) and other **natural areas** make up about **20% of land cover**

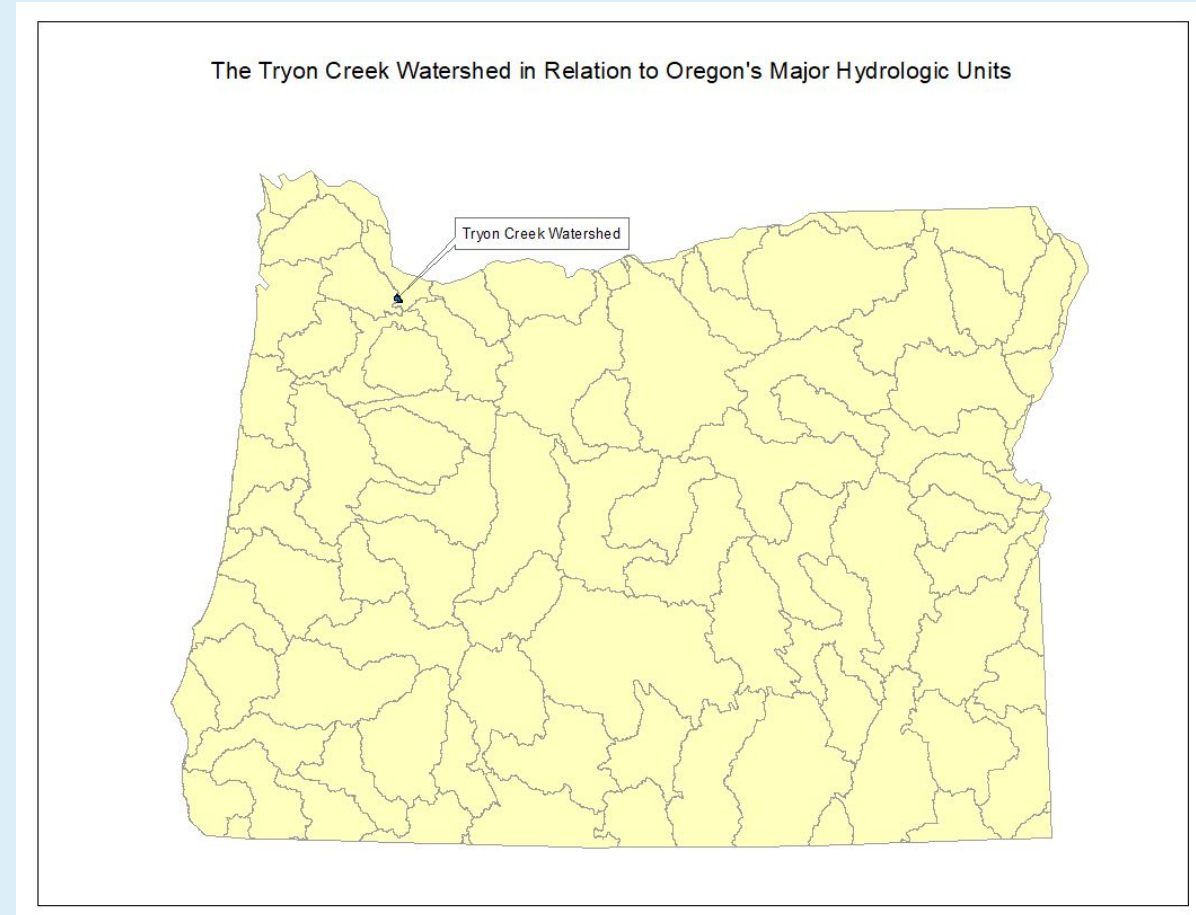


PURPOSE OF A WATERSHED ASSESSMENT

- A **watershed** in this context is described as the area of land with connected ground and surface waterways within which all precipitation and groundwater drain down sloped surfaces to a common point. Watershed boundaries are determined by the landscape and are often manipulated by human development and use of the land.
- Approach:
 - Compile existing data into one resource
 - Use water quality and fish populations as indicators of watershed health
- Deliverables:
 - Evaluation of how natural and human-altered watershed processes influence the ability of the watershed to produce clean water and support fish populations
 - Information that can be used to develop action plans and monitoring strategies to guide future land management practices designed to protect and improve watershed functions
 - Guidance for prioritizing watershed stewardship efforts

STATE APPLICATION OF A WATERSHED ASSESSMENT

- Oregon Watershed Enhancement Board (OWEB)
- Outline provided by the Oregon Watershed Assessment Manual developed by OWEB.
- An interconnected web of watershed assessments throughout the state would provide a better understanding of the processes of the many waterways.
- Inspiration for further scientific study.



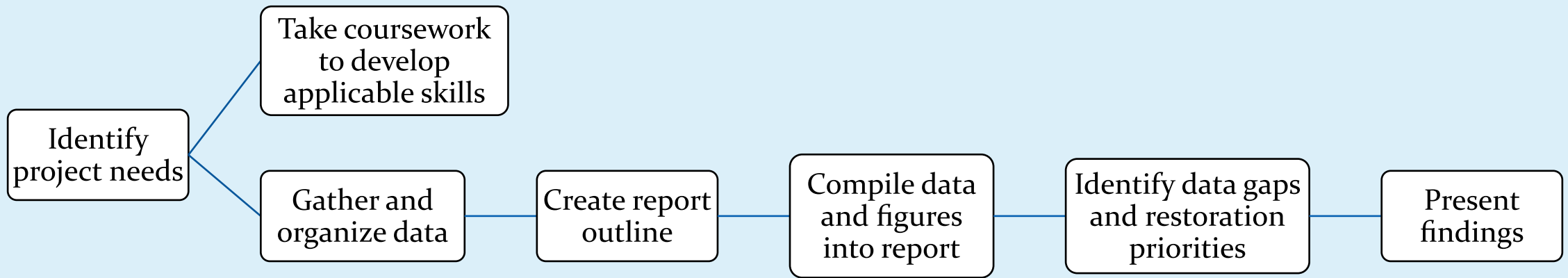
GOALS OF THE TRYON CREEK WATERSHED ASSESSMENT (TCWA)

- Compile existing data and identify data gaps
- Use fish habitat and water quality as indicators of watershed health
- Identify causes of present limiting factors and illuminate actions to correct
- Provide scientific foundation for restoration and protection of the watershed



Source: Barton, A.

TASKS TO COMPLETE THE WATERSHED ASSESSMENT



SECTIONS OF THE TCWA

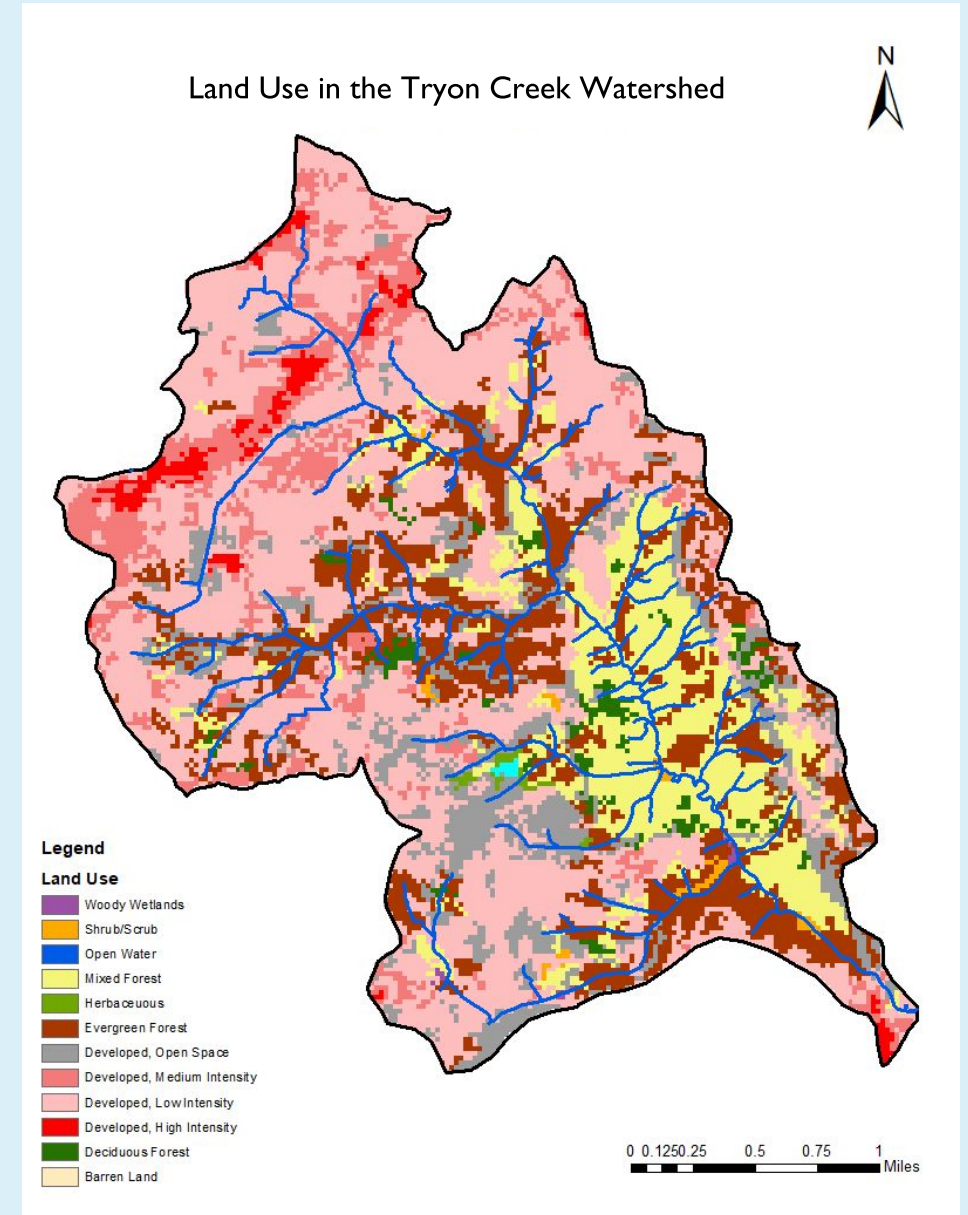
- Introduction
- Historical Conditions
- Channel Habitat Types
- Hydrology and Water Use
- Riparian and Wetlands
- Sediment Sources
- Channel Modifications
- Water Quality
- Fish and Fish Habitat
- Watershed Evaluation



Source: Barton, A.

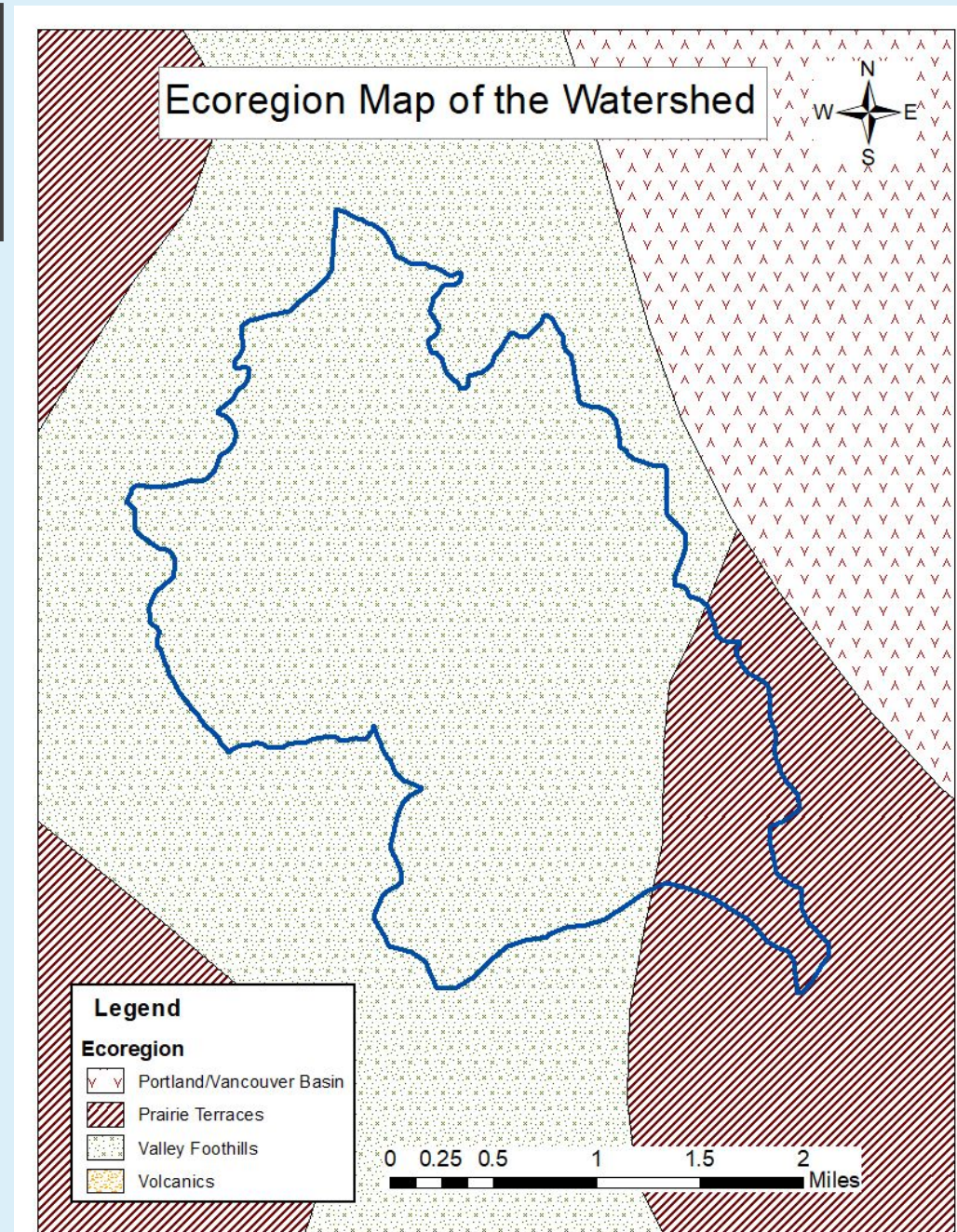
TRYON CREEK WATERSHED ASSESSMENT - INTRODUCTION

- Purpose
 - Construction of background understanding of watershed features
 - Identification of typical issues associated with land use
- Key Findings
 - Land use - about 20% park and open space
 - Urban development concentrated in headwaters and the Willamette River confluence



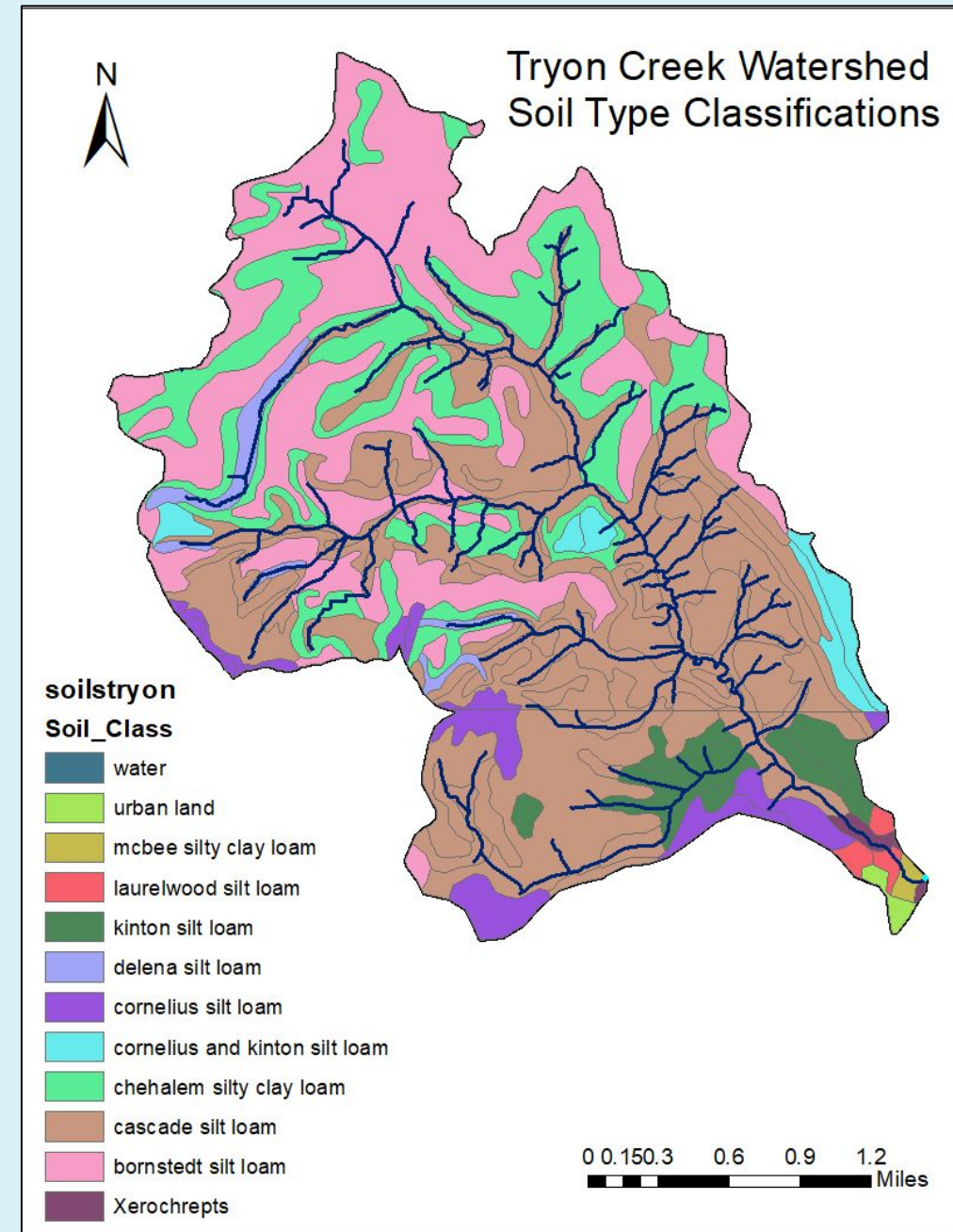
TRYON CREEK WATERSHED ASSESSMENT - INTRODUCTION

- Purpose
 - Construction of background understanding of watershed features
 - Application of understanding of ecosystem to stewardship approaches
- Key Findings
 - Ecoregions – Willamette Valley Foothills and Prairie Terraces



TRYON CREEK WATERSHED ASSESSMENT - INTRODUCTION

- Purpose
 - Construction of background understanding of watershed features
 - Application of understanding of geological and soil characteristics to stewardship approaches
- Key Findings
 - Geology – basaltic lava flows and Missoula Floods
 - Soil – Predominantly Cascade silt loam, Bornstedt silt loam, and Chehalem silty clay loam



TRYON CREEK WATERSHED ASSESSMENT - HISTORICAL CONDITIONS

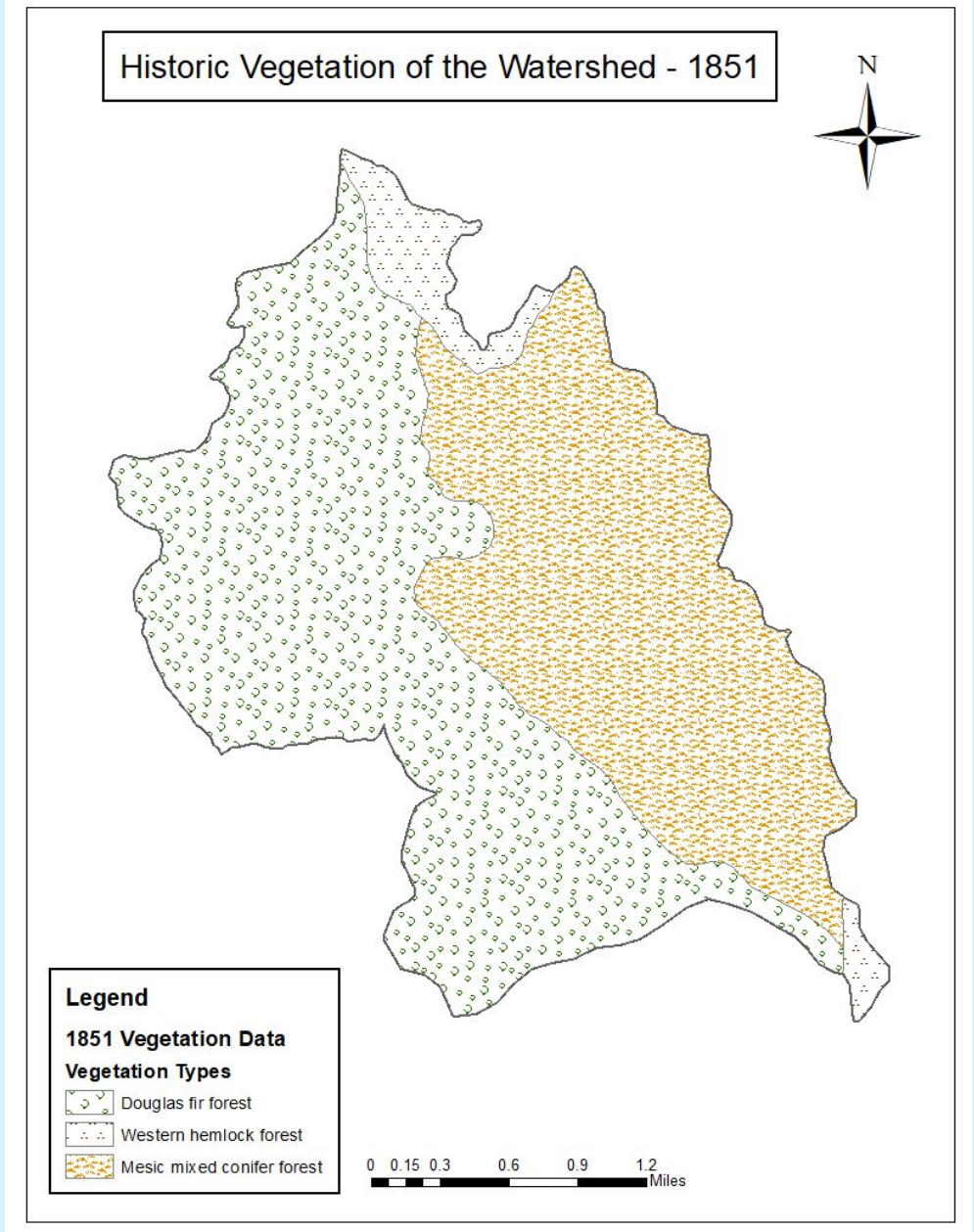
- Purpose
 - Develop narrative of human interactions with Tryon Creek and its resources to help us learn about its current conditions.
- Major timeline categories
 - Pre-settlement
 - European / American Settlement
 - Urban Development
 - Resource Conservation and Stewardship
- Data gaps
 - Records of Native American populations are sparse and varied in content.



Source: Hawkins, W. and Willingham, W.

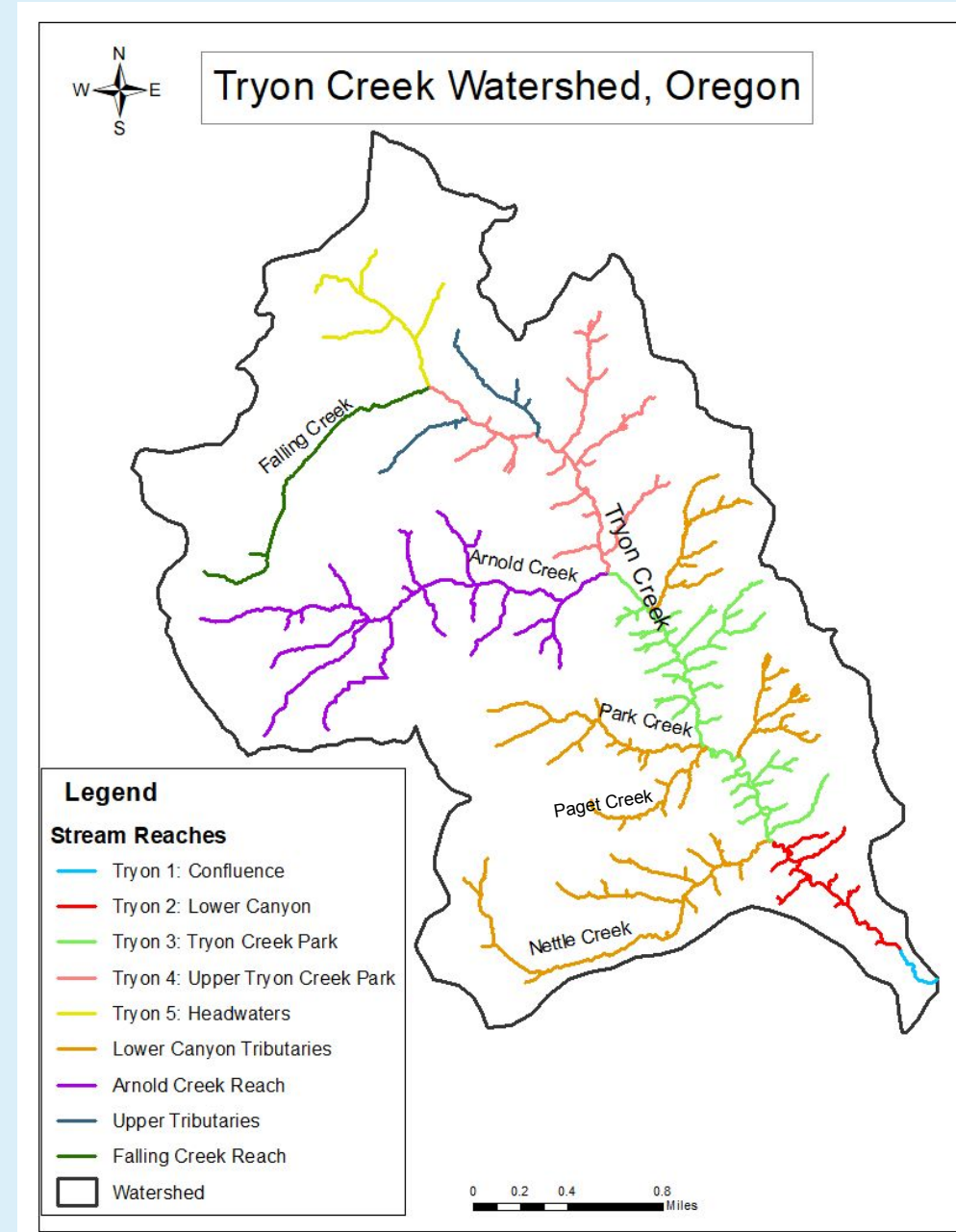
TRYON CREEK WATERSHED ASSESSMENT - HISTORICAL CONDITIONS

- Purpose
 - Develop narrative of human interactions with Tryon Creek and its resources to help us learn about its current conditions.
 - Representation of historic vegetation
 - Guide prioritization of vegetation restoration
 - Observe natural and anthropogenic impacts on forest type shifts



TRYON CREEK WATERSHED ASSESSMENT - CHANNEL HABITAT TYPES

- Purpose
 - Application of stream classification systems for the characterization of the effects of land uses, and guidance for stream restoration and protection.
- Key findings
 - Stream reach descriptions
- Data gaps
 - Data almost 15 years old
 - Methods not consistent with OWEB manual



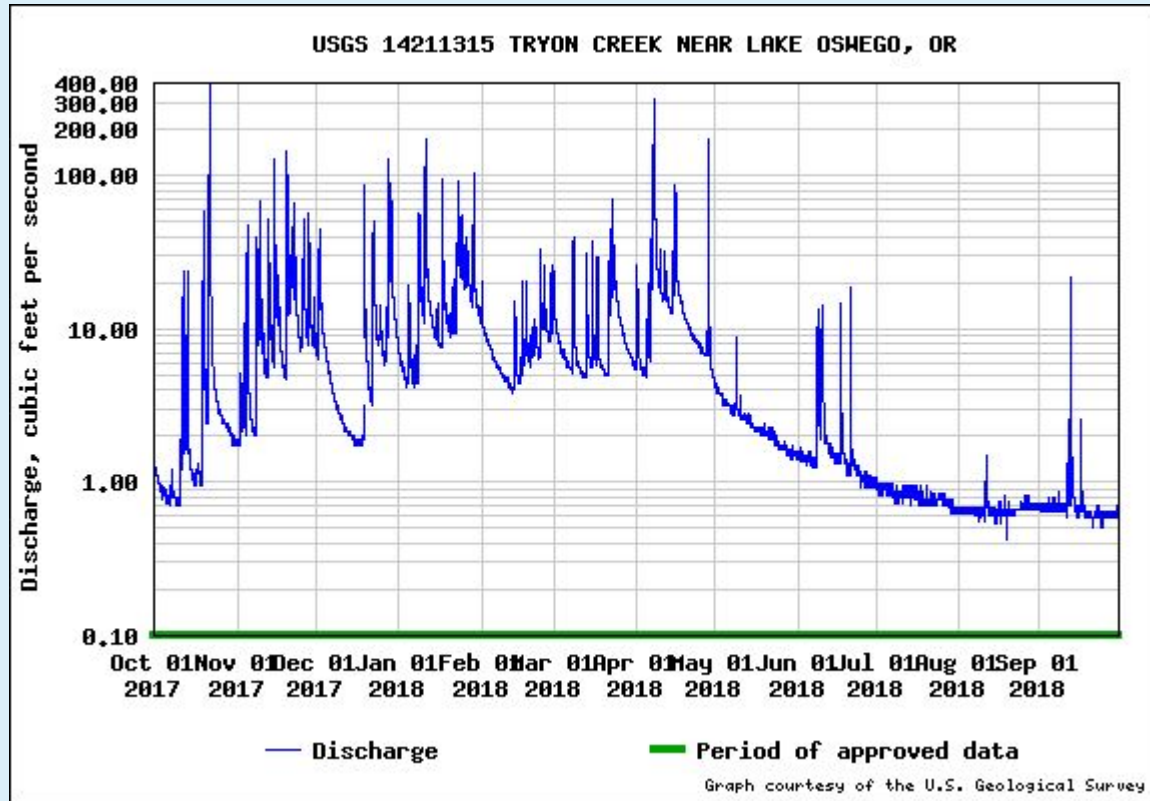
TRYON CREEK WATERSHED ASSESSMENT - HYDROLOGY AND WATER USE

- Purpose
 - Assessment of the hydrologic conditions
 - Demonstration of connections between land use and watershed characteristics
- Key findings
 - Disturbances to the natural hydrological cycle cause downstream effects
 - Impacts of storm events on flow velocity
- Data gaps
 - Water diversion rights records

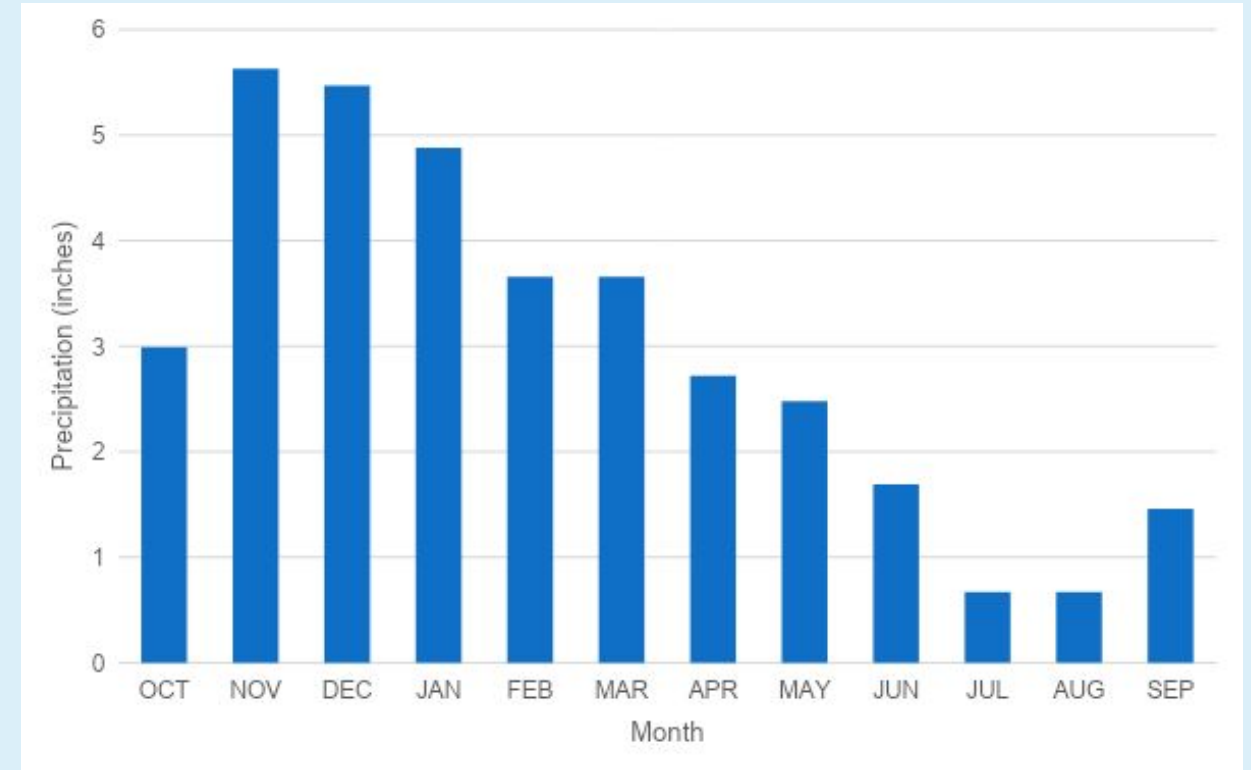


Source: Tryon Creek Watershed Council

TRYON CREEK WATERSHED ASSESSMENT - HYDROLOGY AND WATER USE



United States Geological Survey



United States Climate Data

TRYON CREEK WATERSHED ASSESSMENT - RIPARIAN AND WETLANDS

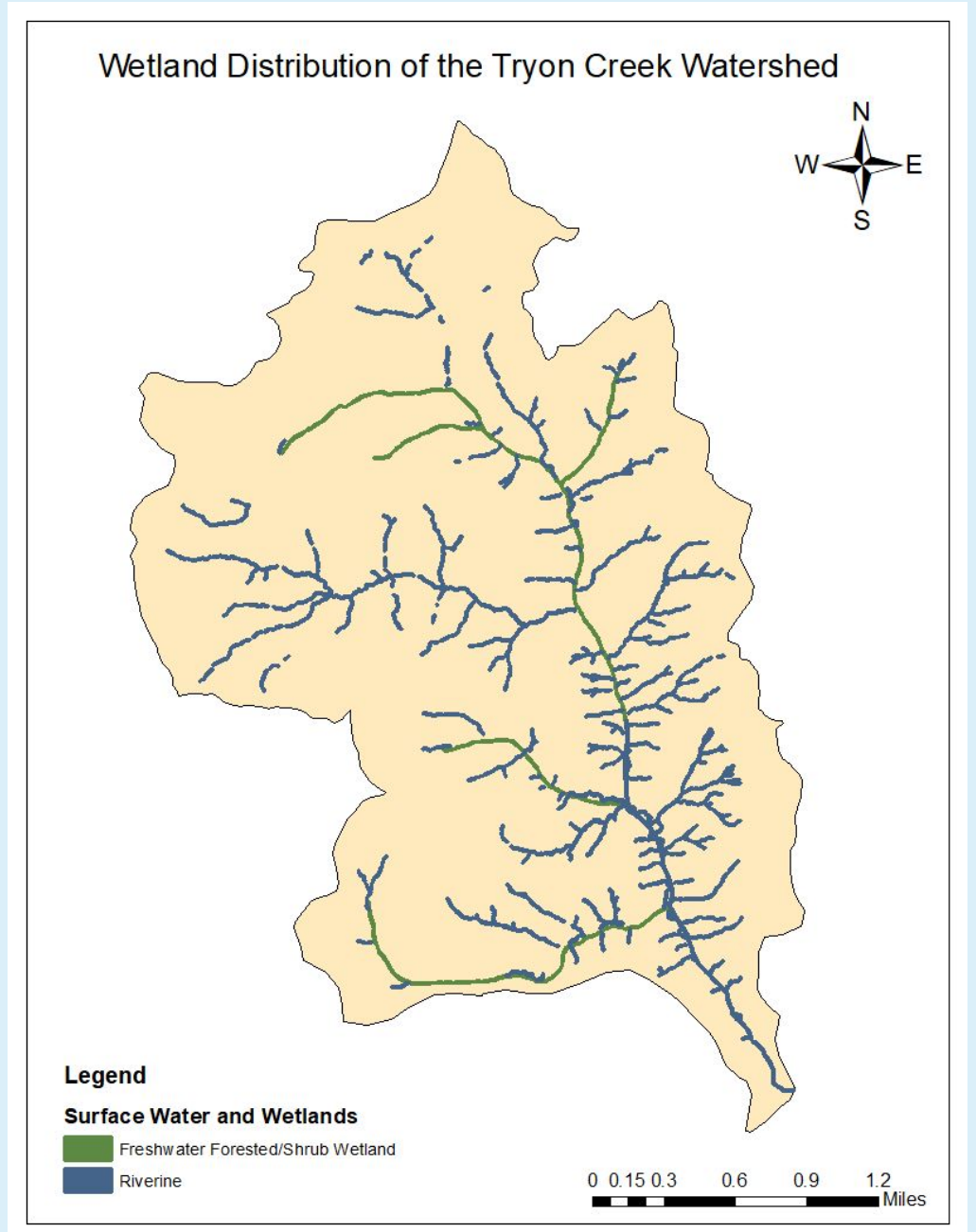
- Purpose
 - Assessment of current riparian vegetation and wetland conditions and their impacts on the health of the watershed
- Key findings
 - Deciduous and mixed conifer forest ecology within Tryon Creek State Natural Area
- Data gaps
 - Assessment of vegetation was solely within the state park



Source: Barton, A.

TRYON CREEK WATERSHED ASSESSMENT - RIPARIAN AND WETLANDS

- Purpose
 - Assessment of current riparian vegetation and wetland conditions and their impacts on the health of the watershed
- Key findings
 - Forest and shrub wetlands are present within the watershed



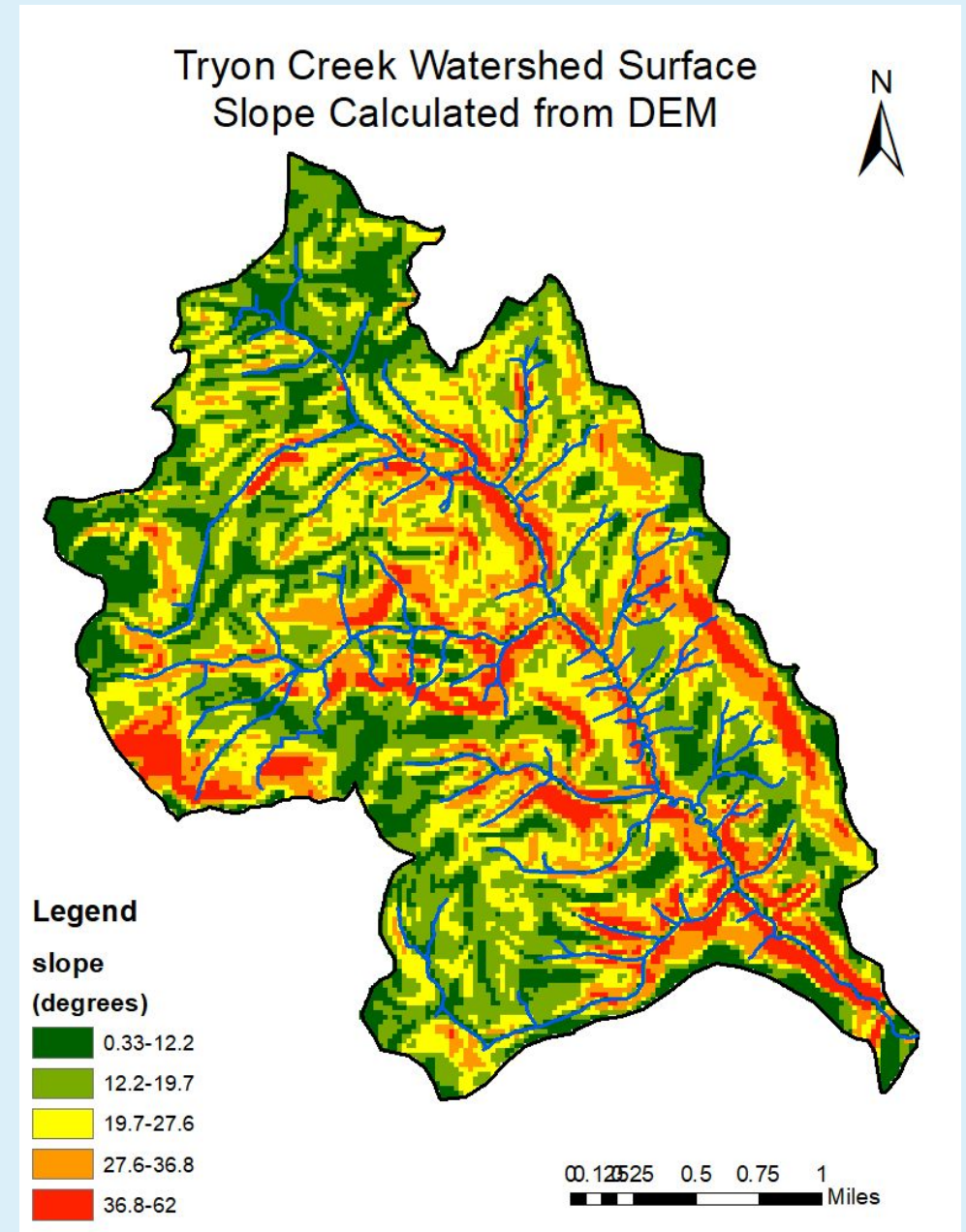
TRYON CREEK WATERSHED ASSESSMENT - SEDIMENT SOURCES

- Purpose
 - Identification and evaluation of potential fine sediment sources
- Key findings
 - Geomorphic characteristics and land use types contribute to erosion throughout the watershed
- Data gaps
 - Understanding of private land stormwater drainage

| Sub-watershed | Impervious Surfaces (Acres) | Sub-watershed Total Area (Acres) | Percentage of Sub-watershed |
|--|-----------------------------|----------------------------------|-----------------------------|
| Tryon Creek Mainstem (including TCSNA) | 696.1 | 3,083.7 | 22.6 |
| Arnold Creek | 192.9 | 775.2 | 24.9 |
| Falling Creek | 105.9 | 283.6 | 37.3 |
| Whole Watershed | 994.9 | 4,142.3 | 24.0 |

TRYON CREEK WATERSHED ASSESSMENT – SEDIMENT SOURCES

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TRYON CREEK WATERSHED ASSESSMENT - CHANNEL MODIFICATIONS

- Purpose
 - Determination of the degree of impact to aquatic habitat by channel modifications
- Key findings
 - Culverts are the most impactful in-stream structures



Source: United States Fish and Wildlife Service

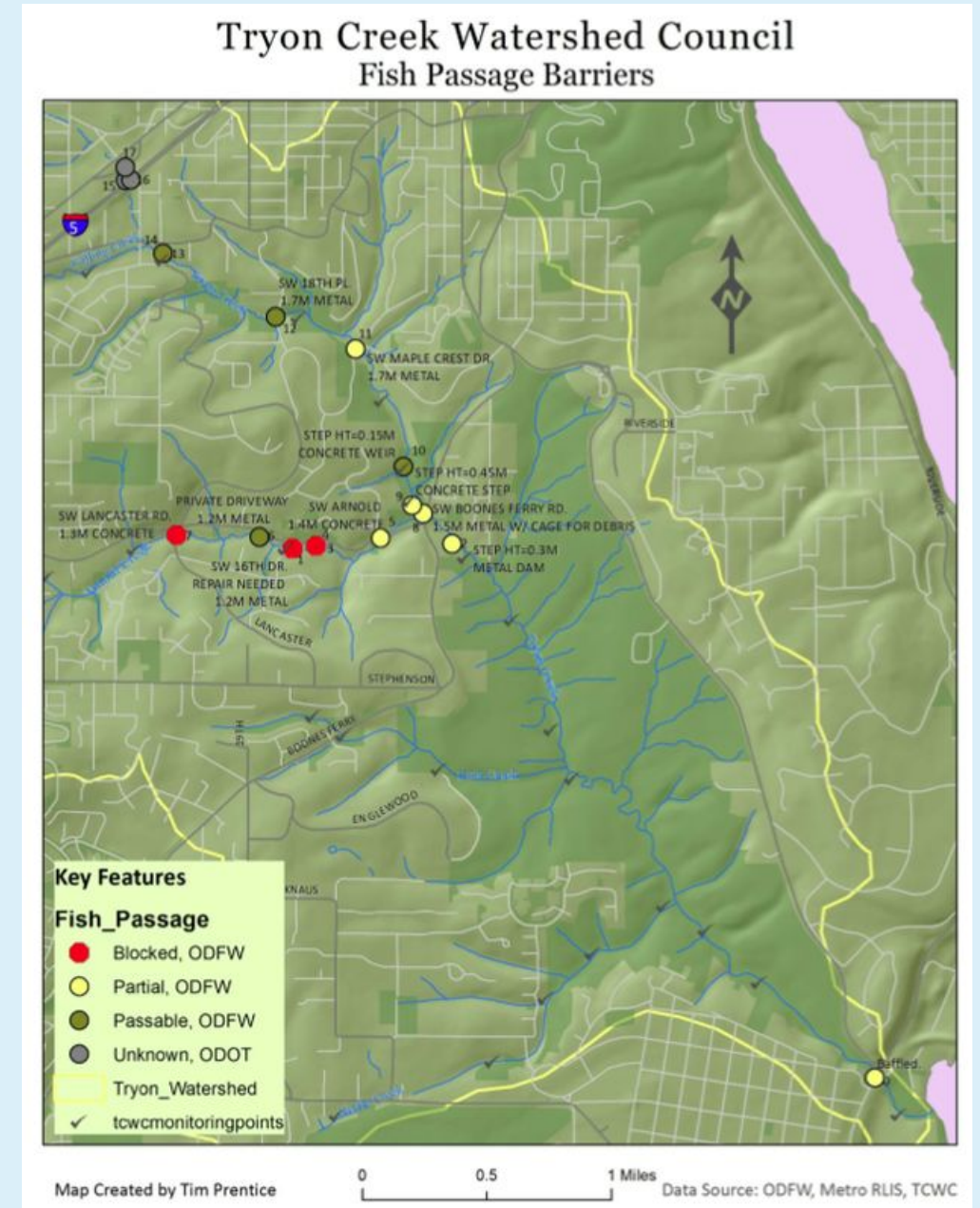
TRYON CREEK WATERSHED ASSESSMENT - WATER QUALITY

- Purpose
 - Application of the beneficial uses and water quality status to assess watershed health
- Key findings
 - Most sensitive beneficial uses are salmonid fish rearing and spawning
 - Tryon Creek is 303(d) listed for temperature, biocriteria, and dissolved oxygen



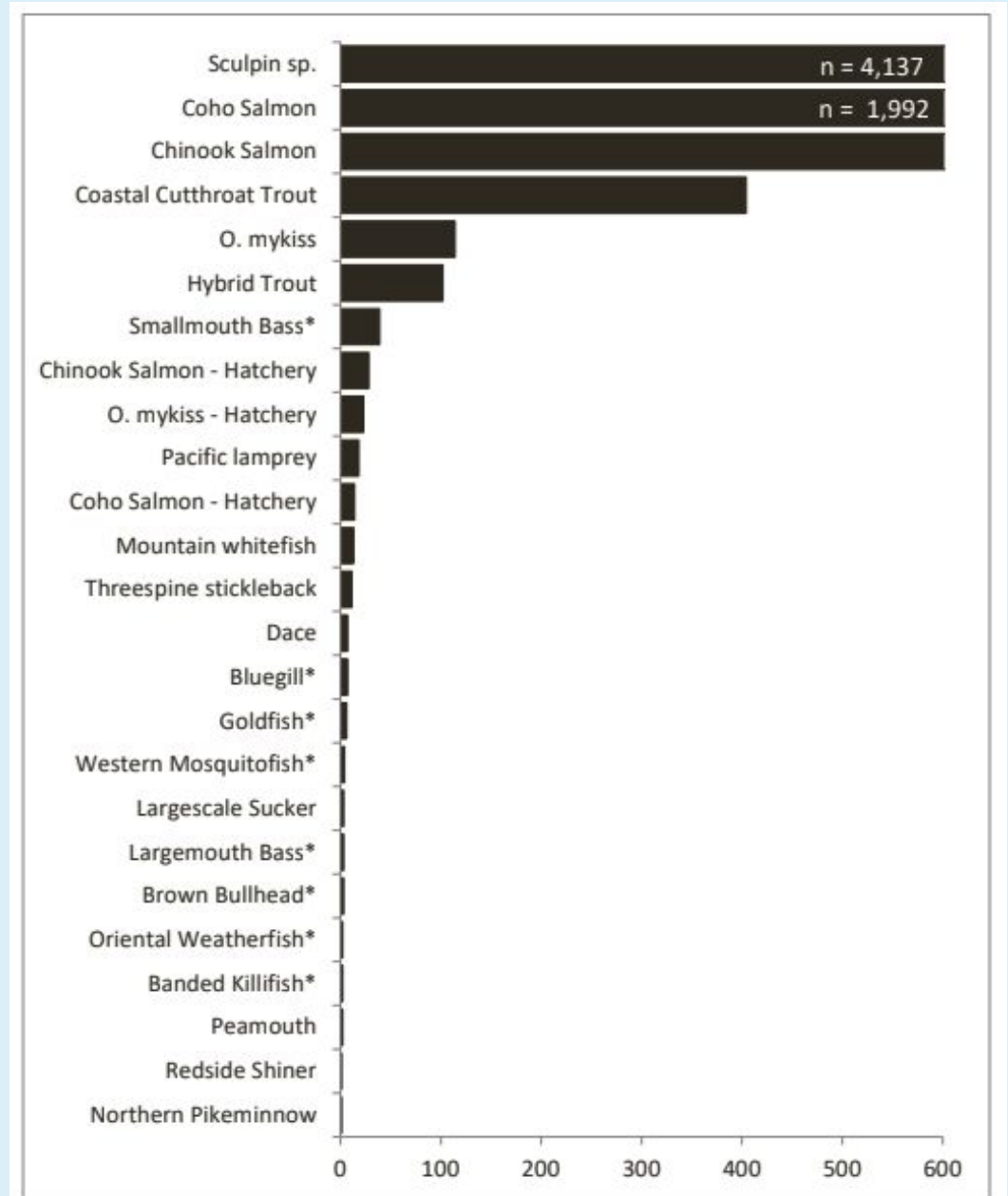
TRYON CREEK WATERSHED ASSESSMENT - FISH AND FISH HABITAT

- Purpose
 - Evaluation of fish populations, in-stream habitat, and migration barriers
 - Application of fish presence to assess watershed health
- Key findings
 - One of the indicators for watershed health used in this assessment is the presence of fish, specifically salmonid species, and their habitats.
 - Fish passage barriers exist close to the confluence with the Willamette River



TRYON CREEK WATERSHED ASSESSMENT - FISH AND FISH HABITAT

| Species | ESA status | ODFW status |
|------------------|-------------------|-------------|
| Coho | Threatened (2004) | Endangered |
| Spring Chinook | Threatened (1999) | Not Listed |
| Winter Steelhead | Threatened (1999) | Critical |
| Pacific Lamprey | Not Listed | Vulnerable |



TRYON CREEK WATERSHED ASSESSMENT - WATERSHED EVALUATION

- Purpose
 - Summarization of information collected in other sections
 - Identification of data collection and stewardship opportunities
- Key summaries
 - Urbanization is highly impactful on Tryon Creek due to effects of impervious surfaces and channel modifications
 - The function of watershed processes responds positively to protection and restoration



Source: Barton, A.

RESTORATION AND STEWARDSHIP PRIORITIES

- Continue to promote the Backyard Habitat Certification
- Encourage channel meandering and daylighting near headwaters and confluence
- Continue to remove invasive plant species throughout watershed
- Restore areas of wetlands and flood zones, specifically within TCSNA
- Restructure impactful culverts- Hwy 43, Boones Ferry Rd
- Continue to improve stormwater drainage and riparian zones to benefit water quality parameters
- Survey for and encourage beaver habitat

EDUCATIONAL AND DATA COLLECTION RECOMMENDATIONS

- Partner with the cities of Portland and Lake Oswego and other local agencies
- Continue to expand presence at community tabling events
- Continue to educate landowners about native landscaping and applications to prevent erosion
- Further data collection of channel habitat types
- Inventory of private water diversion features
- Assessment of stormwater drainage on private land



Source: TCWC

THANK YOU!

Questions?

ACKNOWLEDGEMENTS

- I appreciate the professional support, guidance, and contributions of:
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