Wetland Monitoring and Assessment Strategy

Tulalip Tribes of Washington

Presented By
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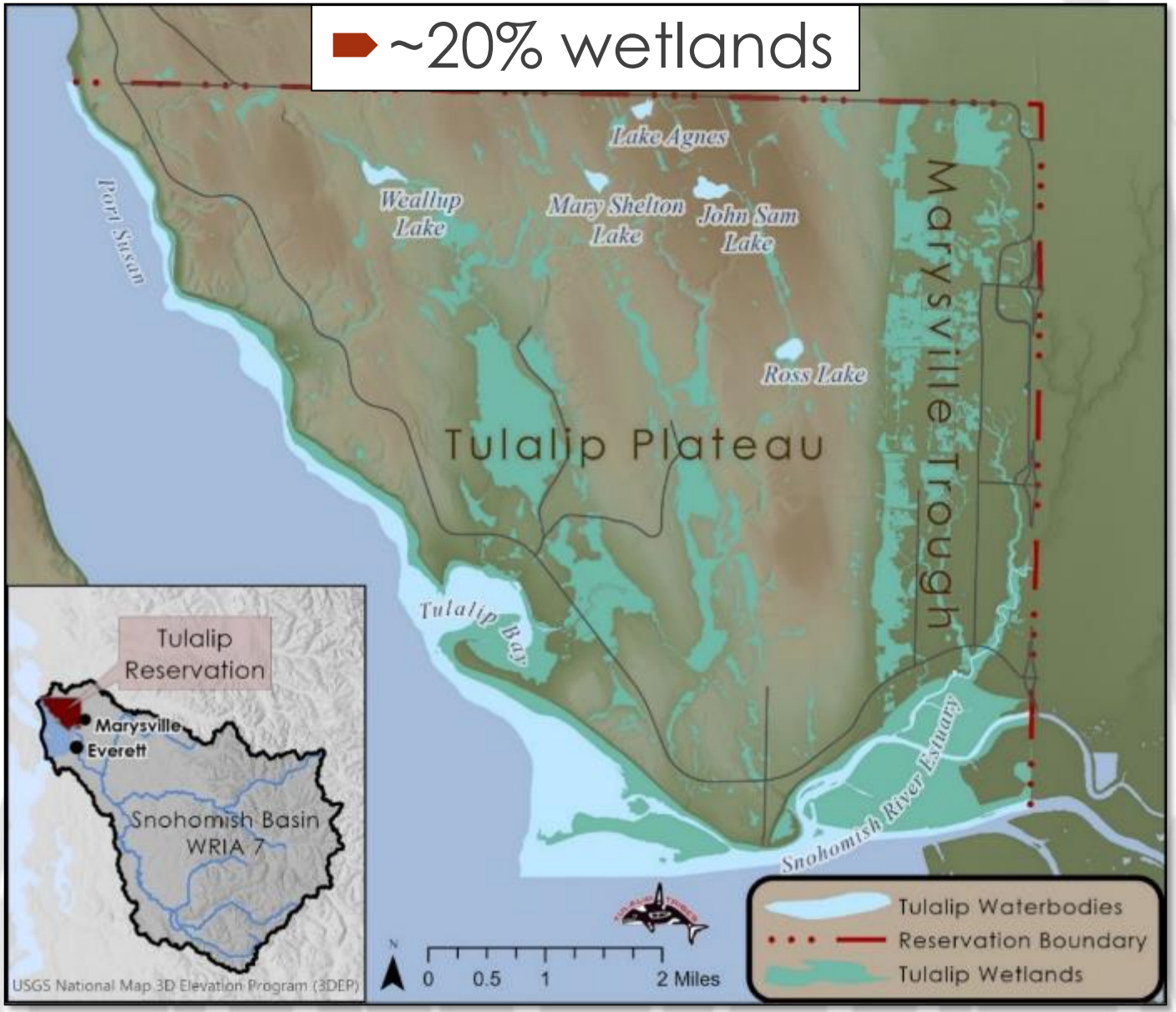
With Special Thanks to
Darla Boyer, Jon Hall, and Holly Zox

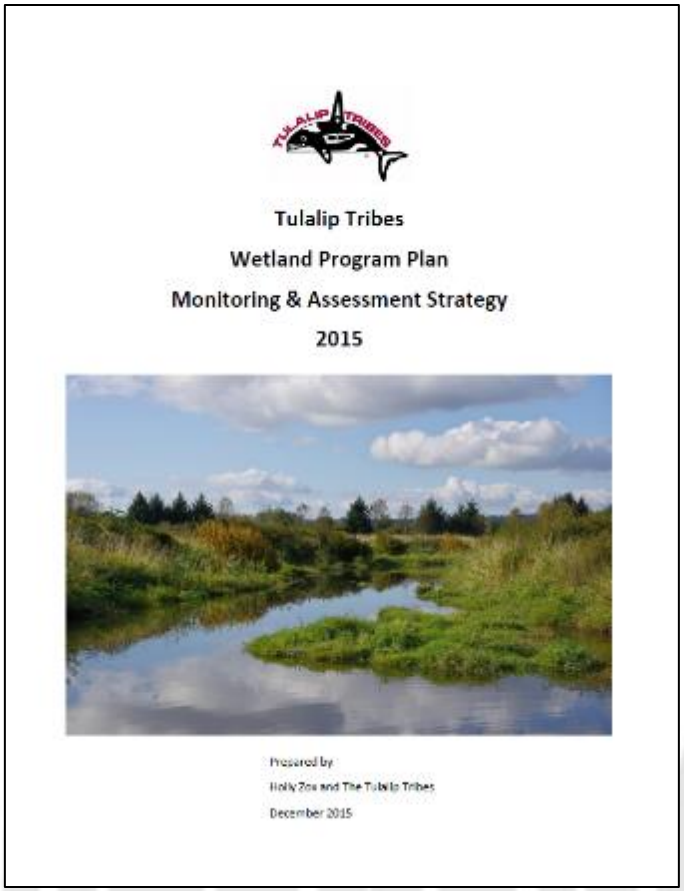
Tulalip Tribes of WA

- Successors in interest to the Snohomish, Snoqualmie, Skykomish, and other allied bands signatory to the 1855 Treaty of Point Elliot

Tulalip Reservation



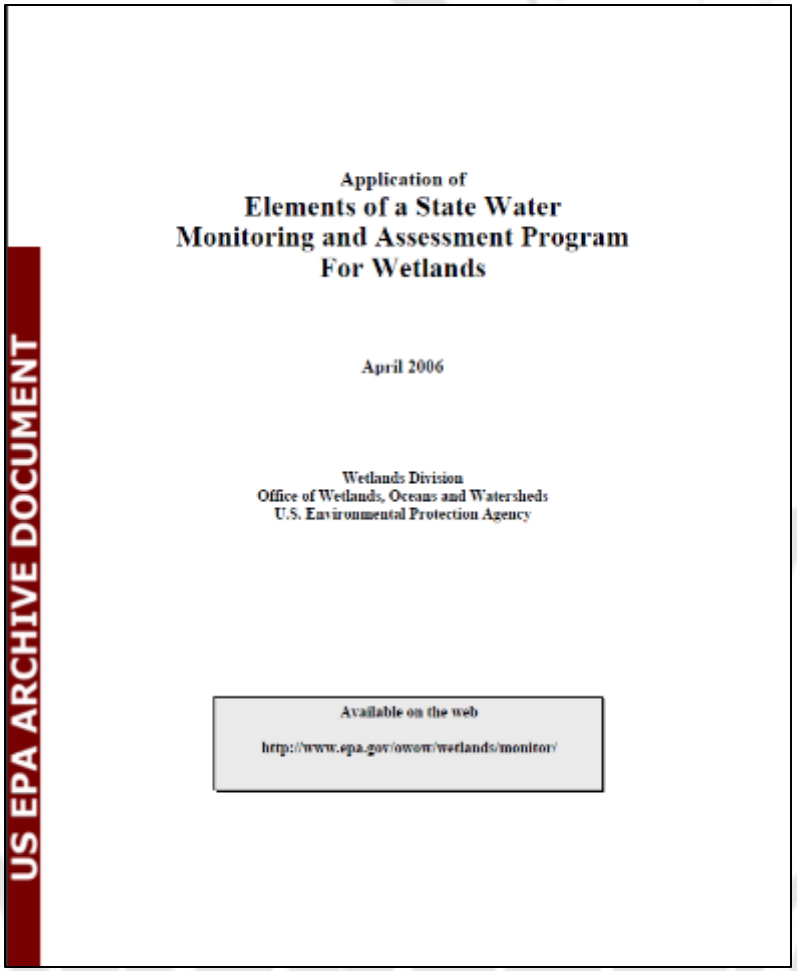
Wetland Monitoring & Assessment Strategy



- Protect Tulalip wetlands for sustenance of tribal culture and spiritual practices
- Funded since ~2013 by WPDGs, hard dollars, and §106 of the CWA

WMAS Structure

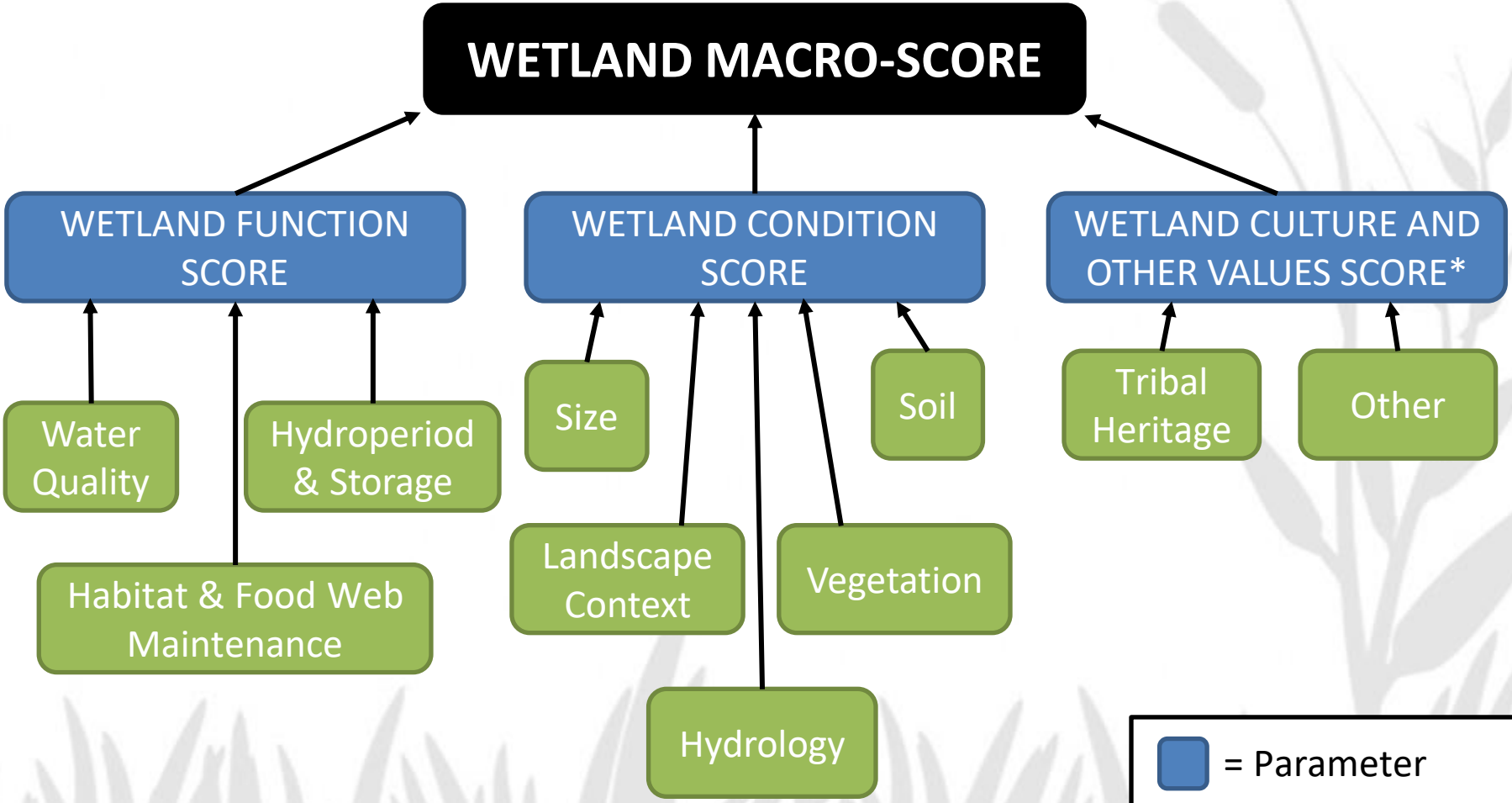
- EPA's 3-level hierarchical technical approach (US EPA 2006)
- Standardized regional methods
  - Modified/created for Tribe-specific needs



WMAS Structure

- L1: **Landscape assessment** (GIS & remote sensing)

WMAS L1 (Landscape)



*"Culturally sensitive data will be kept internal to the Tulalip Tribes to safeguard treaty-protected resources, cultural resources, and tribal interests"

WMAS Structure

- L1: **Landscape assessment** (GIS & remote sensing)
- L2: **Rapid field assessment** (qualitative)

WMAS L2 (Rapid)

- Function: **Wetland Ecosystem Services Protocol for the US** (WESPUS) beta V1.1 (Adamus 2011)
- Condition: **Ecological Integrity Assessment** (EIA) (Rocchio and Crawford 2011, Faber-Langendoen et al. 2012a, Rocchio and Crawford 2015, Rocchio *et al*. 2020)
- Condition: **Floristic Quality Assessment** (FQA) (Rocchio and Crawford 2013)
- Stressors: **Stressor Impact and Stressor Checklist** (Faber-Langendoen et al. 2012 and Master et al. 2012, Rocchio *et al*. 2020)
- Cultural Values: **Tulalip Cultural Checklist**

WMAS Structure

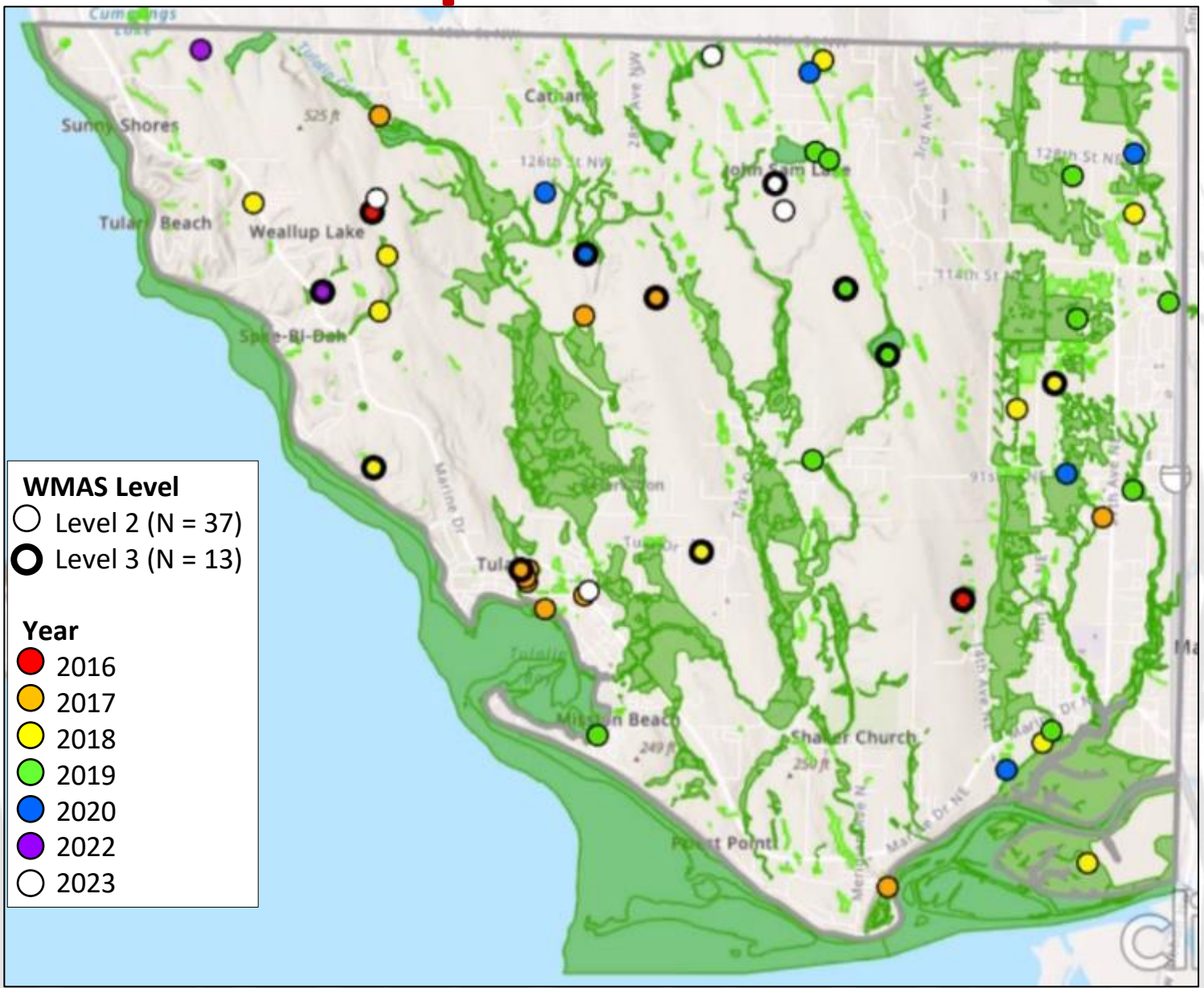
- L1: **Landscape assessment** (GIS & remote sensing)
- L2: **Rapid field assessment** (qualitative)
- L3: **Intensive field assessment** (qualitative + quantitative)

WMAS L3 (Intensive)

All L2 protocols + quantitative metrics like:

- Vegetation: relative abundance of vascular plant species, vertical biotic structure
- Soil: soil texture, organic layer features, depth to redox
- Hydrology: flooding/water table depth
- Water Quality: temperature, pH, conductivity

Tulalip WMAS Sites



What do we do with WMAS data?

- Create plant lists for wetland restoration/mitigation projects
- Provide plant species data to Cultural Resources Department
- Update wetland geodatabase
  - Removed mapped wetlands that don't actually exist on the ground
  - Updated wetland type (e.g., shrub to forested)
- Outreach - connect with property owners to provide info about wetlands

Future of Tulalip WMAS

- Analyze data
  - Develop descriptions of reference standard conditions
- Create plan for wetland protection, enhancement, restoration, and creation
- Re-evaluate protocols
- Begin revisiting wetlands

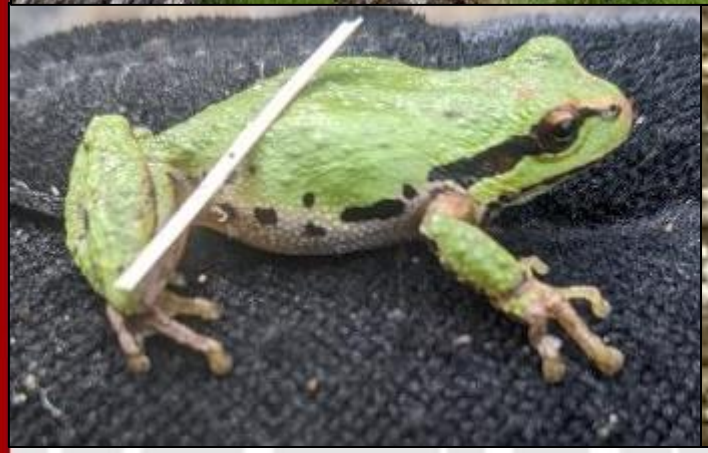
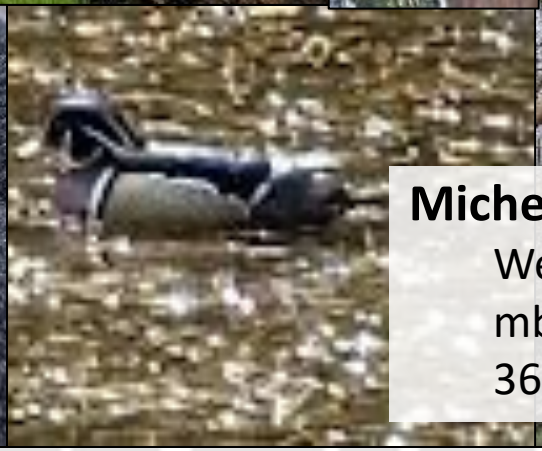
Lessons Learned

- Funding is a challenge
  - Wetland Program Development Grants (WPDGs)
  - Tribal Grants under §106 of CWA
- Using regional protocols can be useful starting point
- Consider structure of sampling design
- "Living" documents/protocols can be helpful
- Have a database for data entry/analysis

t́ig^{w}icid! (Thank you!)





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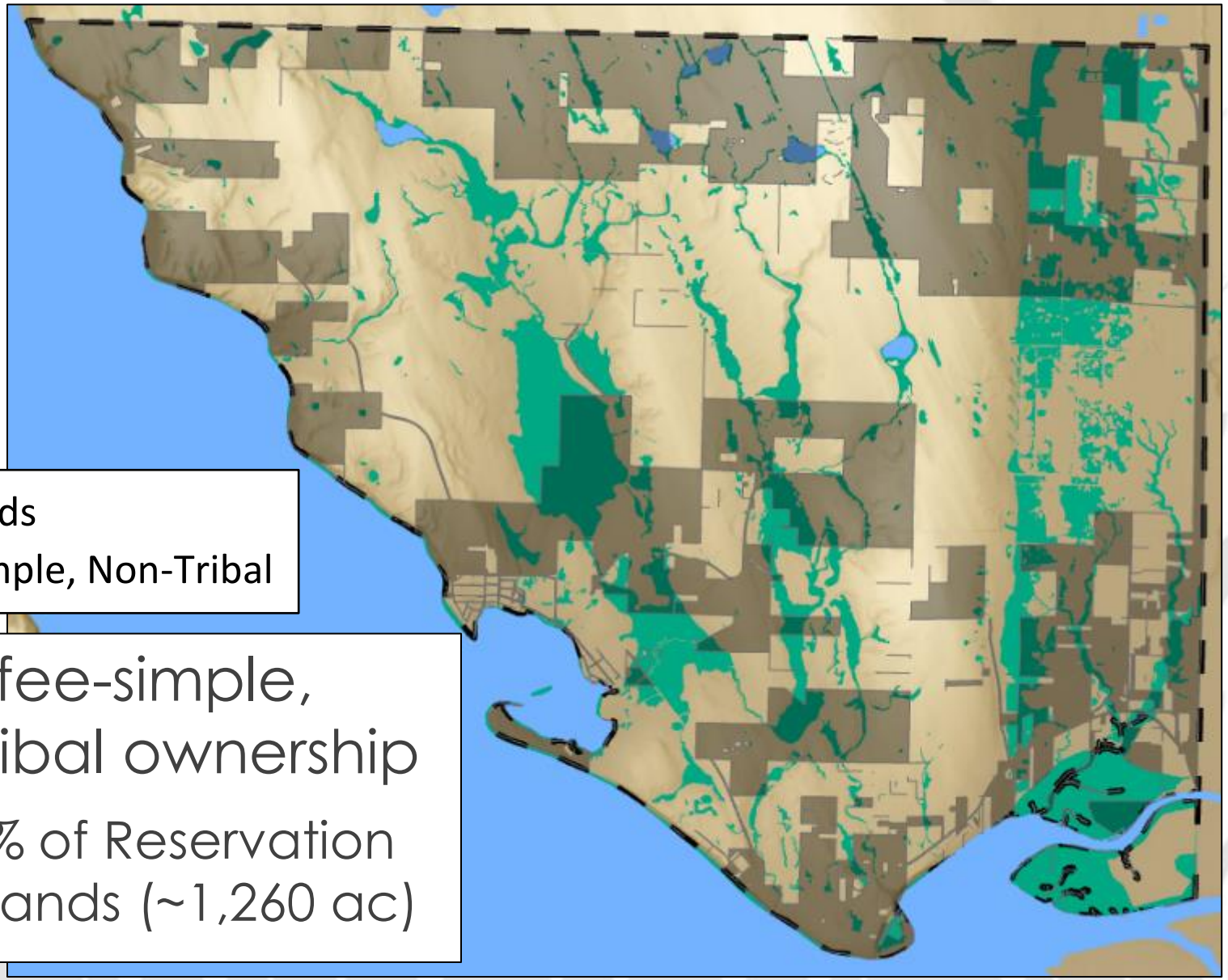
ADDITIONAL INFORMATION

Tulalip Reservation



- ~43% fee-simple, non-tribal ownership
  - ~33% of Reservation wetlands (~1,260 ac)

Tulalip Wetland Program

- Began in the 1990s and expanded in 2008
- Funded by Wetland Program Development Grants, hard dollars, and Section 106 funding
  - 2020-2026 Tulalip Wetland Program Plan (Hall 2020)
  - Tulalip Wetland Inventory (geodatabase)
    - User Guide for the Tulalip Wetland Inventory Data Layer (Hall 2020)
  - Wetland Monitoring and Assessment Strategy (Zox & the Tulalip Tribes 2015)
  - WMAS Field Operation Manual Ver. 3 (Zox & Hall 2021)

WMAS L3

Level 3 Intensive Condition Assessment Parameters

Vegetation	Soil	Water Quality	Hydrology
Relative Abundance Vascular Plant Species	Texture of First Mineral Horizon	Temperature	Depth of flooding
Coarse Woody Debris	Depth of Organic Layer	pH	Depth to Water Table
Organic Matter Accumulation	Degree of Surface Organic Horizon Decomposition	Conductivity (µS/cm)	Stream Thalweg Depth
Vertical Biotic Structure	Depth to restrictive layer		Stream Bank Full Width
	Depth to Redox Concentrations or Depletions		