



## Incorporating Traditional Ecological Knowledge and Cultural Information Into Wetland Protection, Management, and Restoration - Tulalip Reservation

By

Jonathan Hall, Wetland Biologist, Tulalip Tribes



Weallup Lake Wetland Complex, Tulalip Reservation



Harvesting Native Trailing Blackberry; Wetland Fringe, Tulalip Reservation



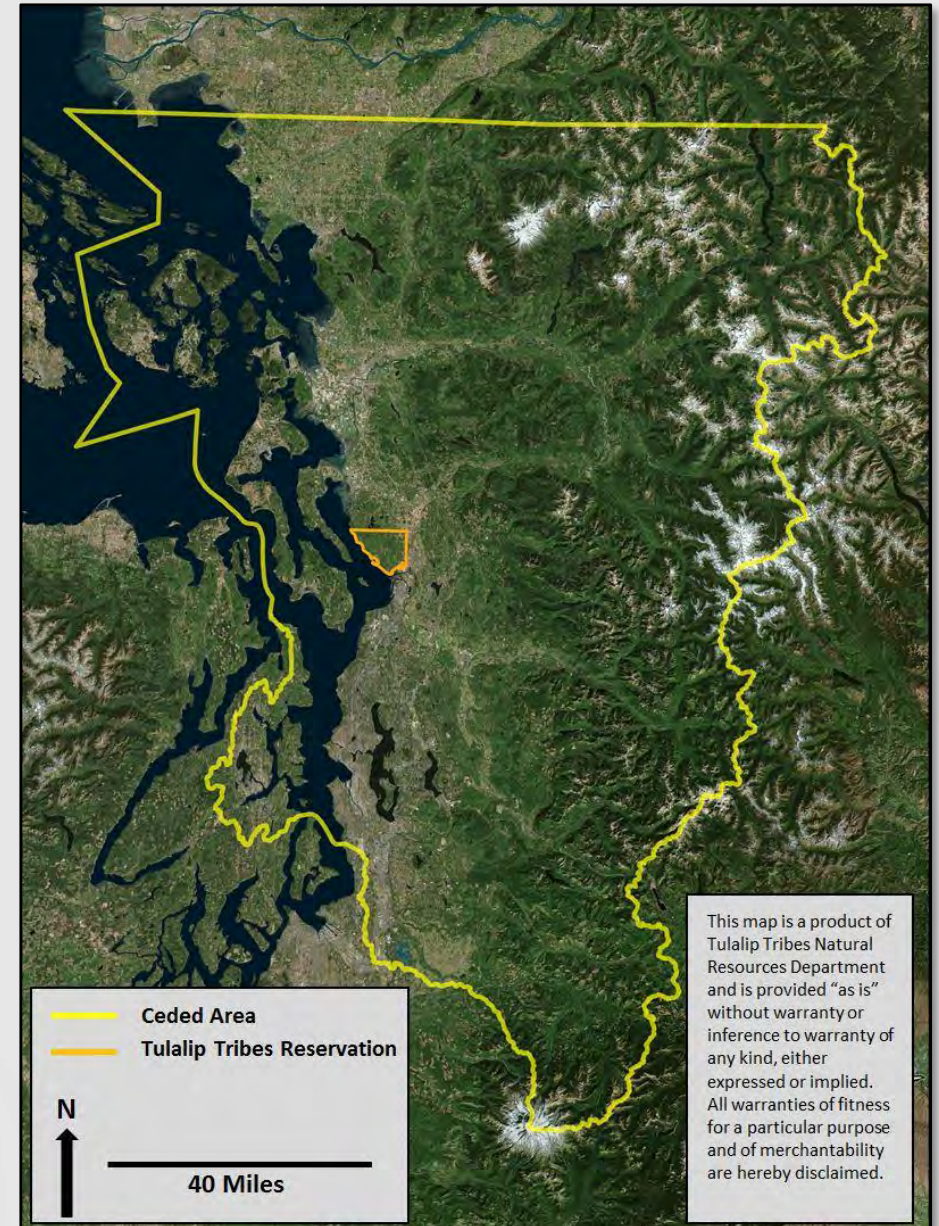


## Background

- ▶ 1855 Treaty of Point Elliott reserved rights to hunt, gather and fish at Usual and Accustomed Places
- ▶ The Tulalip Tribes emphasize protecting Wetland Cultural Values Both On and Off Reservation

*“Following our teachings and values, it shows the importance of our environment, how we need to take care of it and protect it and honor it – so it will continue for future generations – to support us.*

**Inez Bill, Rediscovery Coordinator, Tulalip Tribes**







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- ▶ Tulalip Reservation: 22,567 acres





## Background

### Tulalip Tribes Wetland Program

- ❖ **Guided by Wetland Program Plan (2013 – 2019)**  
Update in Progress (2020 – 2026)



#### 1. **Monitoring & Assessment**

- Comprehensive and Continuously-Updated Inventory
- Monitoring & Assessment Field Data Collection

#### 2. **Regulation**

- Revisions to Tribal Codes Related to Wetlands and Waters
- Technical Support to Planning, Forestry, Construction, Utilities, etc. regarding wetland regulations, permits, and functions

#### 3. **Voluntary Restoration & Protection**

- Wetland Acquisition
- Wetland and Riparian Enhancement Emphasizing Culturally Significant Species and Wildlife Food/Habitat Species

#### 4. **Water Quality Standards for Wetlands**



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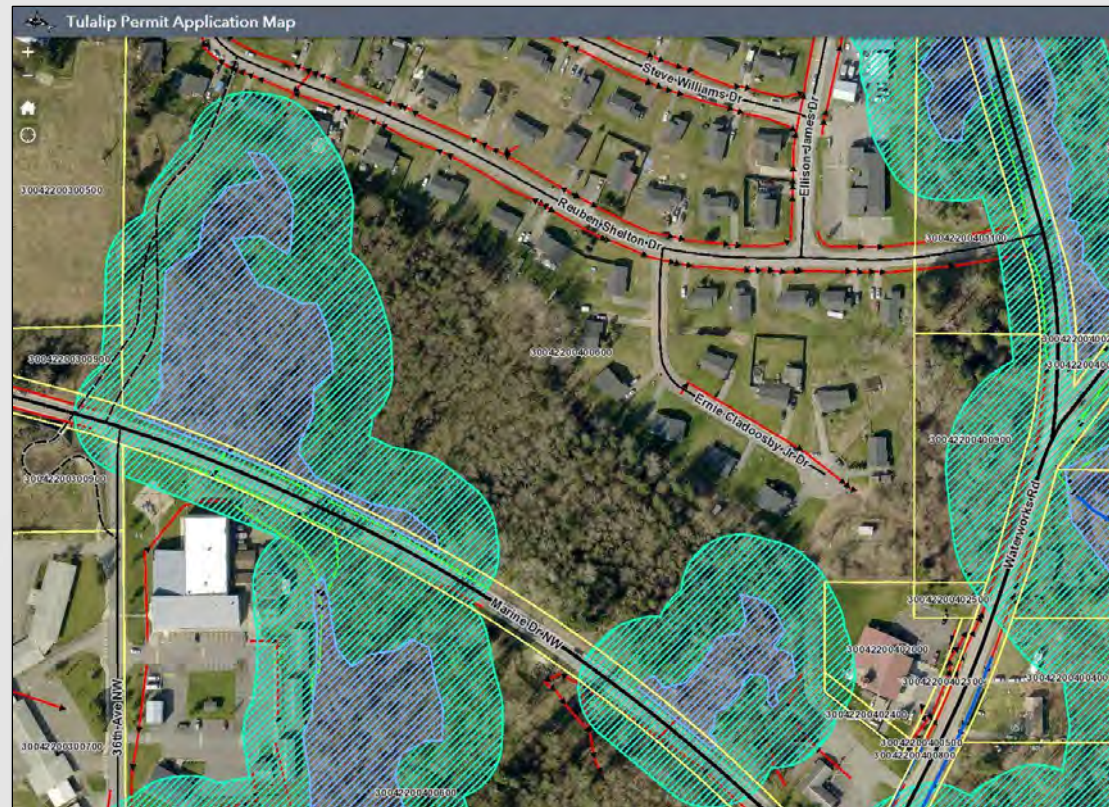




## Tulalip Wetland Inventory Update

The database that hosts the Tulalip Wetland and Stream Inventory was Rebuilt in 2018

- Allows for easy editing and tracking of versions
- Daily updates (at midnight) of the master data layer. The update is immediately viewable by users of the inventory on Tulalip Web Portals (e.g., Tulalip Permit Application Map Portal)




Tulalip Permit Application Map Portal




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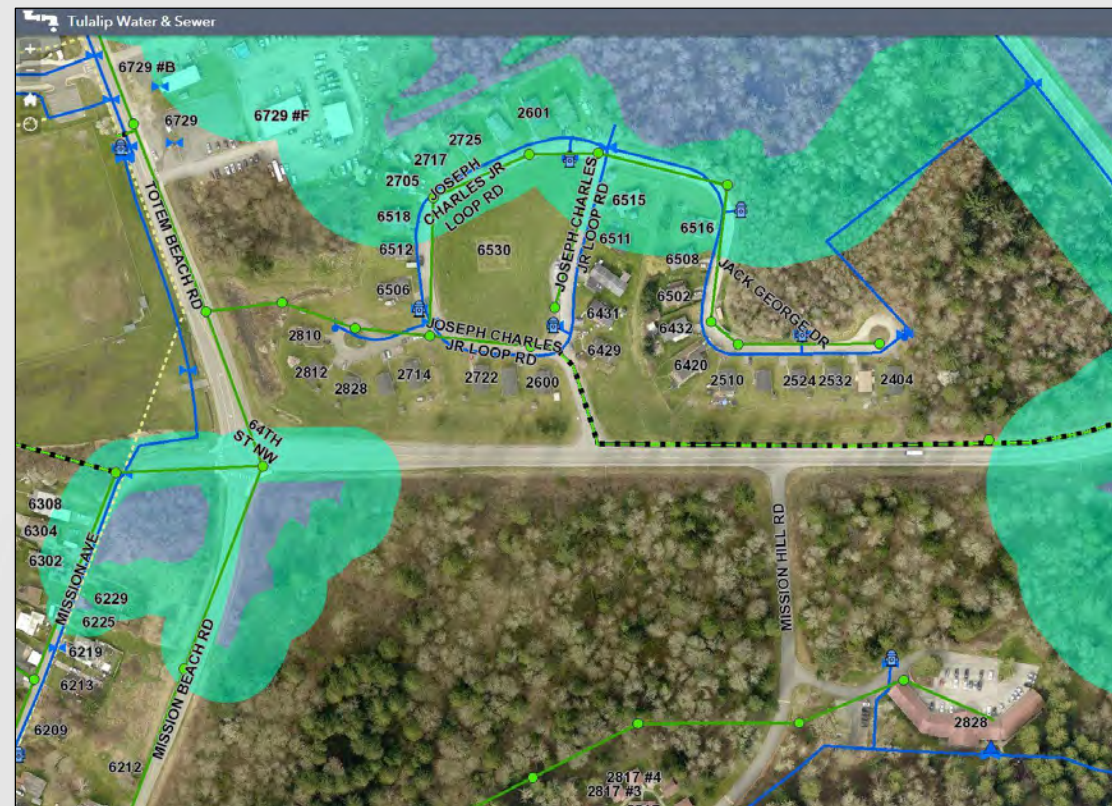
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 Forestry Tulalip Tribes Forestry

 Tulalip Stormwater Map

 Tulalip Septic Systems

 Tulalip Water & Sewer

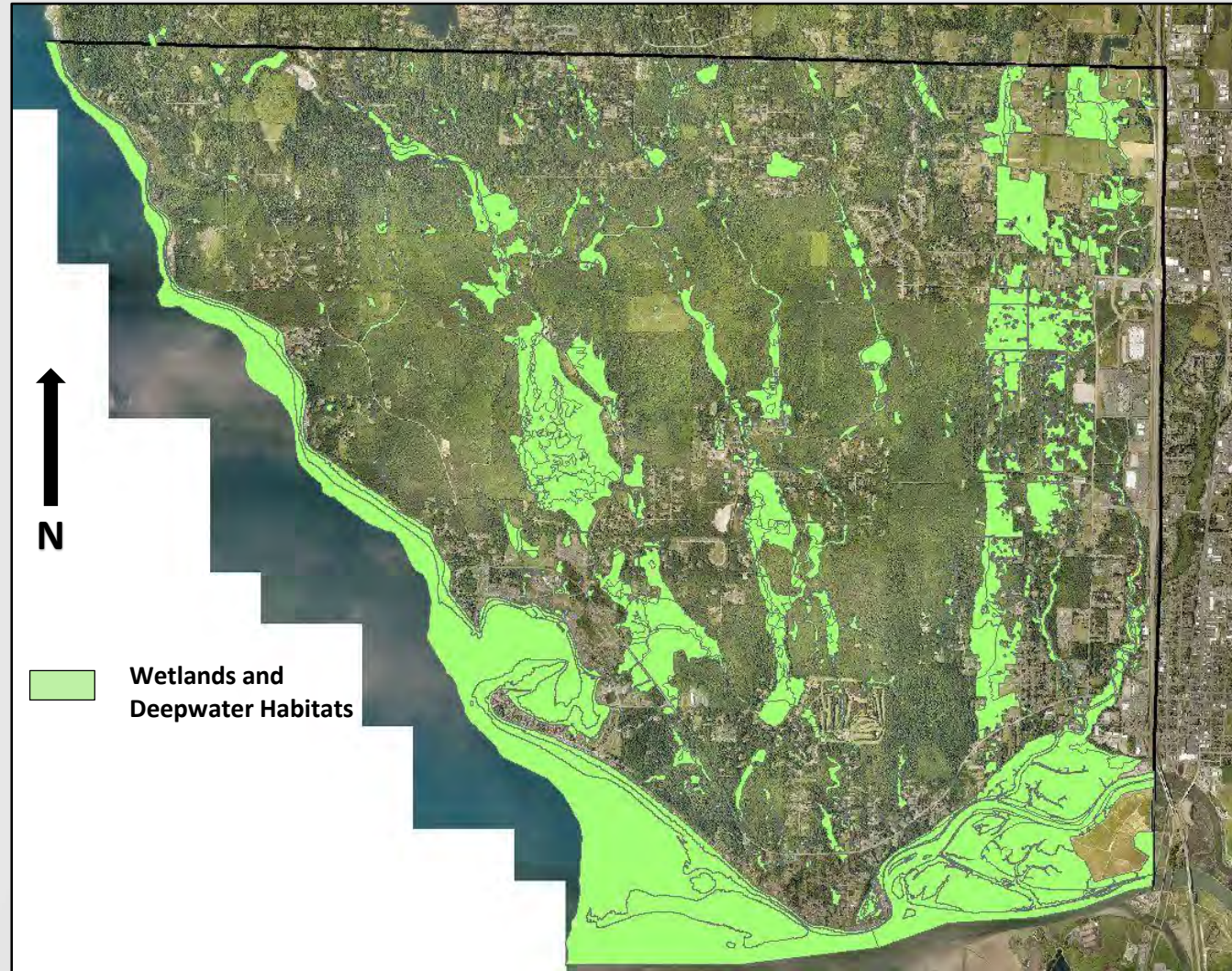


Tulalip Water & Sewer Map Portal





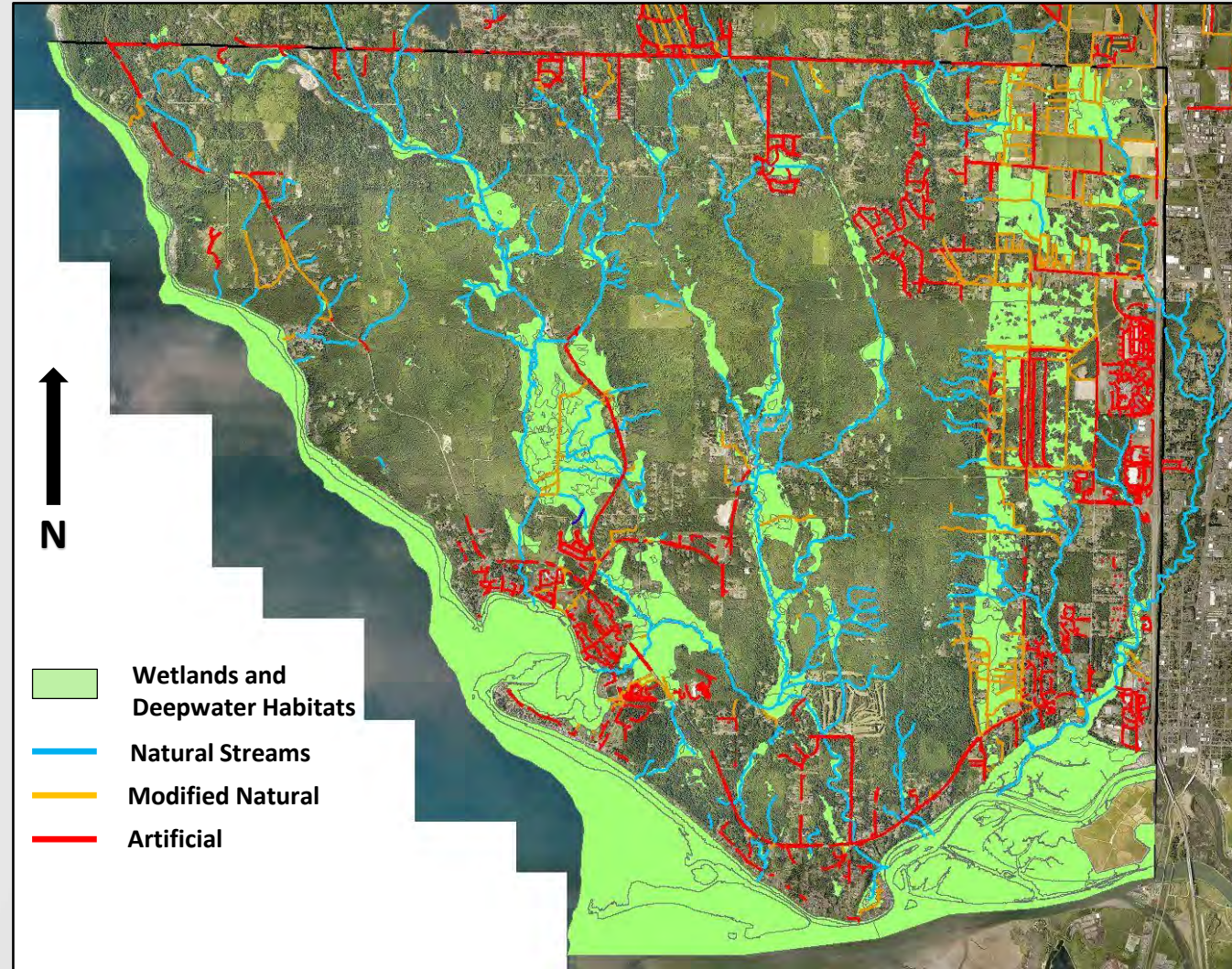
# Tulalip Wetland Inventory Update







# Tulalip Wetland Inventory Update







# Tulalip Wetland Inventory Update

## Data Sources

High-resolution, multi-year aerial imagery including leaves-off and summer acquisitions



Spring 2014, 4 in. resolution



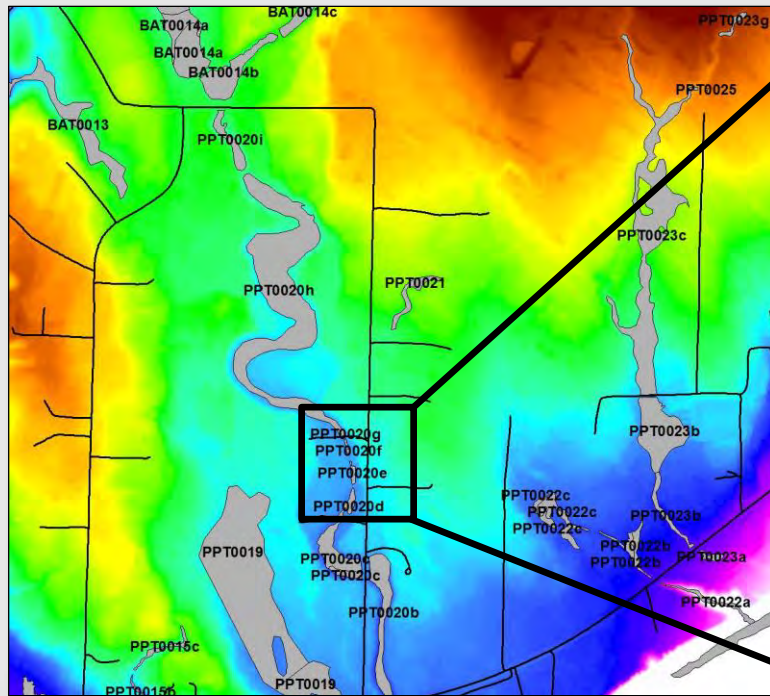
Summer 2017, 3 in. resolution





# Tulalip Wetland Inventory Update Data Sources

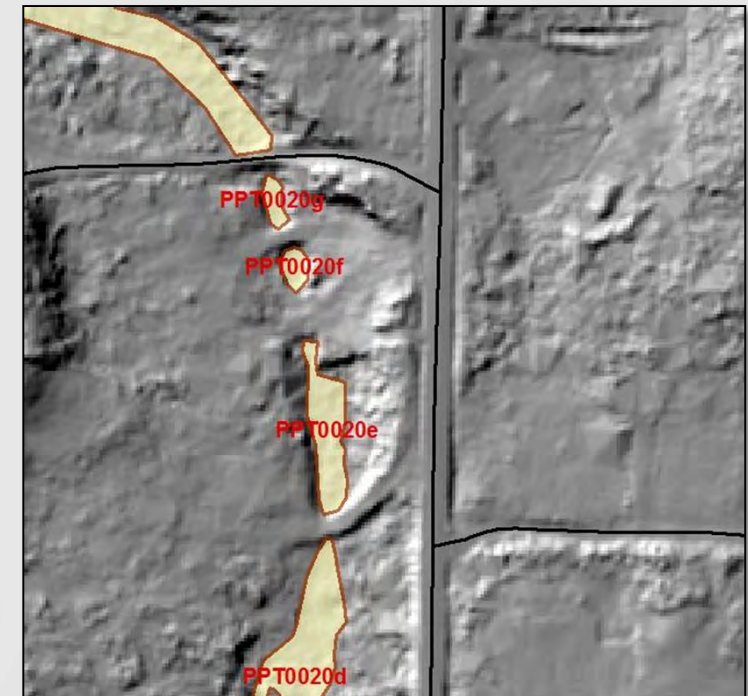
## High-resolution LiDAR data and derived products



LiDAR 2013; approx. 1' resolution



----- 1' contours and hill-shade products derived from LiDAR data -----



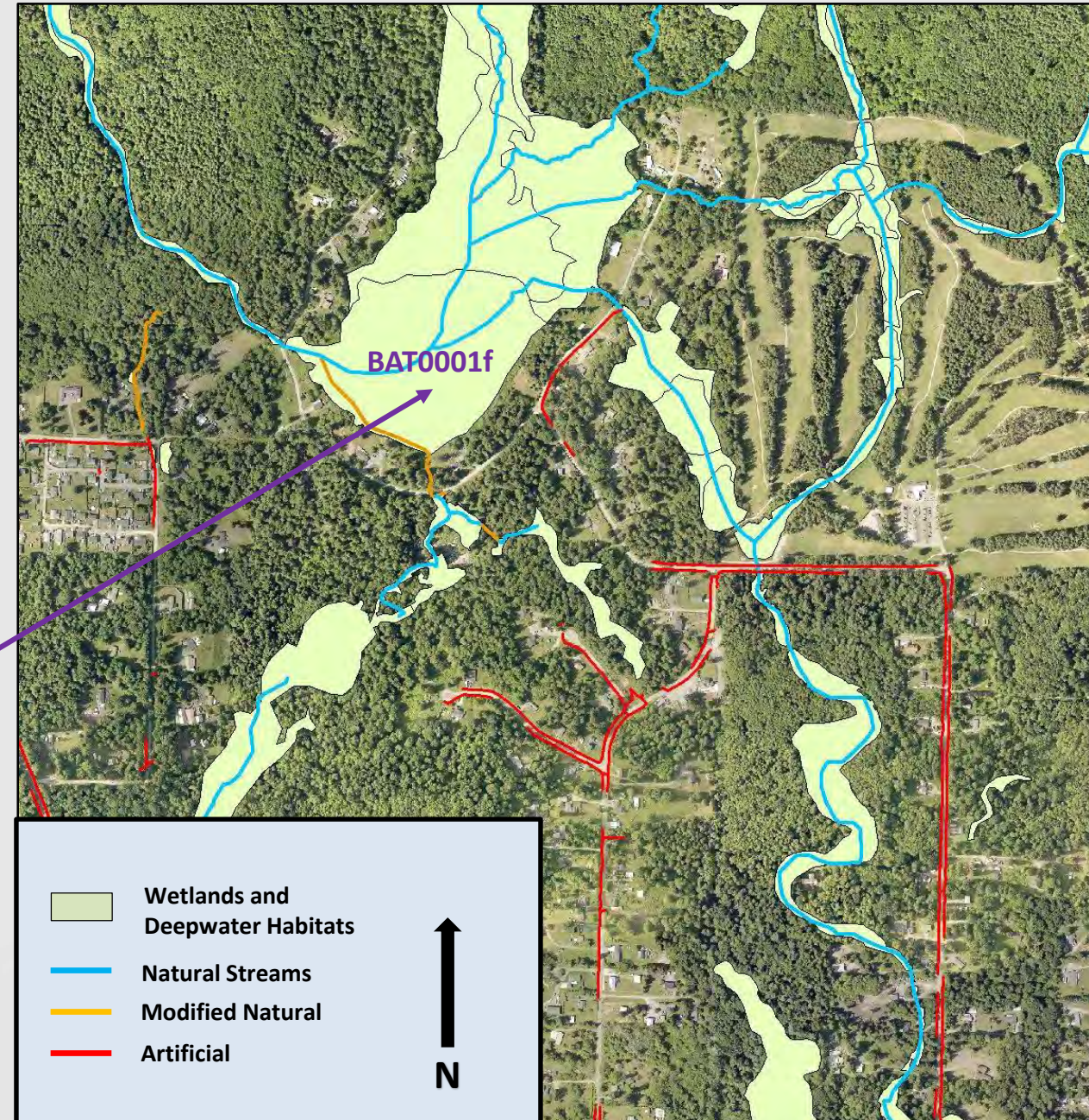




## Tulalip Wetland Inventory Update

### Data Fields for Each Wetland Polygon

Wetland ID	BAT0001f
Acres	21.96
Tulalip Class	Critical
Map Confidence	Medium/High
Watershed	Battle Creek
Cowardin Code	PSS1/EM1Eb
HGM Class	Slope
WA Spec. Characteristics	Bog/Fen
<b>Culturally Sensitive Species</b>	* non-public info *
<b>Cultural Score</b>	* non-public info *
<b>Cultural Notes</b>	* non-public info *
Fish Presence	resident
Existing Impact	High
Threat of Impact	High
Stream Connection	Yes
Nearshore Connection	Yes
Connected Wetland	Yes
Ground Delineated	Partial
Seeps/Springs	Yes
Interpretation	LiDAR/ortho/partial field







## Cultural Assessment: Landscape Scale

### INDICATORS Used to Develop Cultural Scores (GIS Analysis)

#### ECOLOGICAL FACTORS:

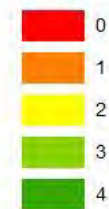
- Presence of open water
- Presence of lacustrine habitats
- Presence of estuarine habitats
- Presence of stream flow
- Presence of mature forest
- Presence of bog and fen habitats

#### ACCESS and QUALITY:

- Tribal ownership
- Distance to nearest road, and type of road
- Distance to nearest development, distance to nearest building



#### Cultural Scores



This map is a product of Tulalip Tribes Natural Resources Department. Tulalip Tribes Natural Resources Department makes no claim as to the accuracy, completeness, or content of any data contained herein. This map is not intended to reflect the exterior or tideland boundaries of the Tulalip Reservation. All warranties of fitness for a particular purpose and of merchantability are hereby disclaimed. No part of this document may be reproduced without prior consent of the Tulalip Tribes.

September, 2015



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## Wetland Monitoring and Assessment (M&A)

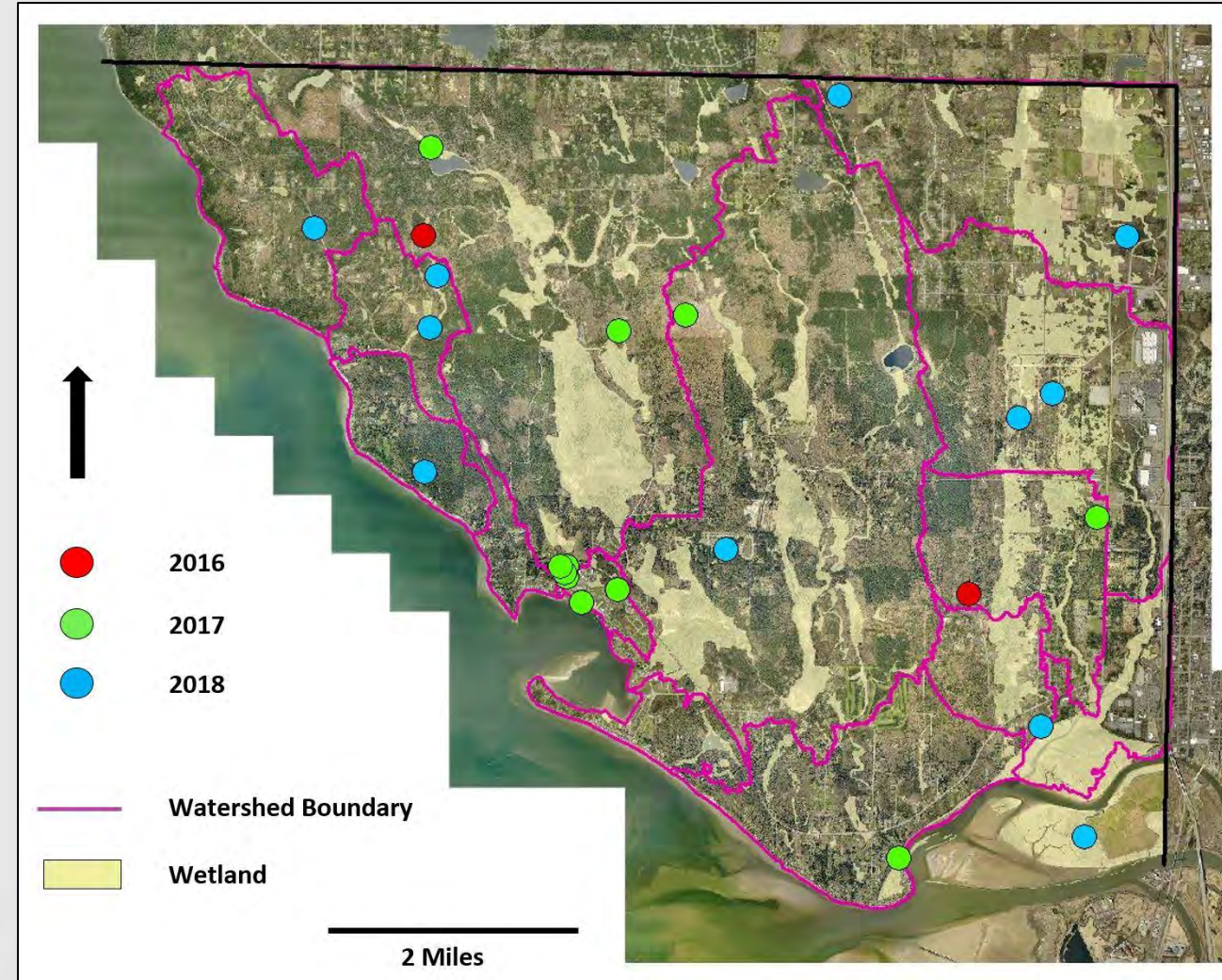
### Level 2 Rapid M&A Procedure

- Ecological Integrity Assessment Form
- Wetland Ecosystem Services Protocol (WESPUS)
- NatureServe Stressor Checklist
- **Wetland Cultural Values Checklist**
- Plant Species Inventory and Floristic Quality Assessment

### Level 3 Intensive M&A Procedure

- In addition to Level 2 information (above), Level 3 includes:

- Measurements of Organic Matter Accumulation, CWD, and Vertical Biotic Structure
- Recording canopy cover for all species in quadrats
- Soil Characteristics
- Water Quality Measurements







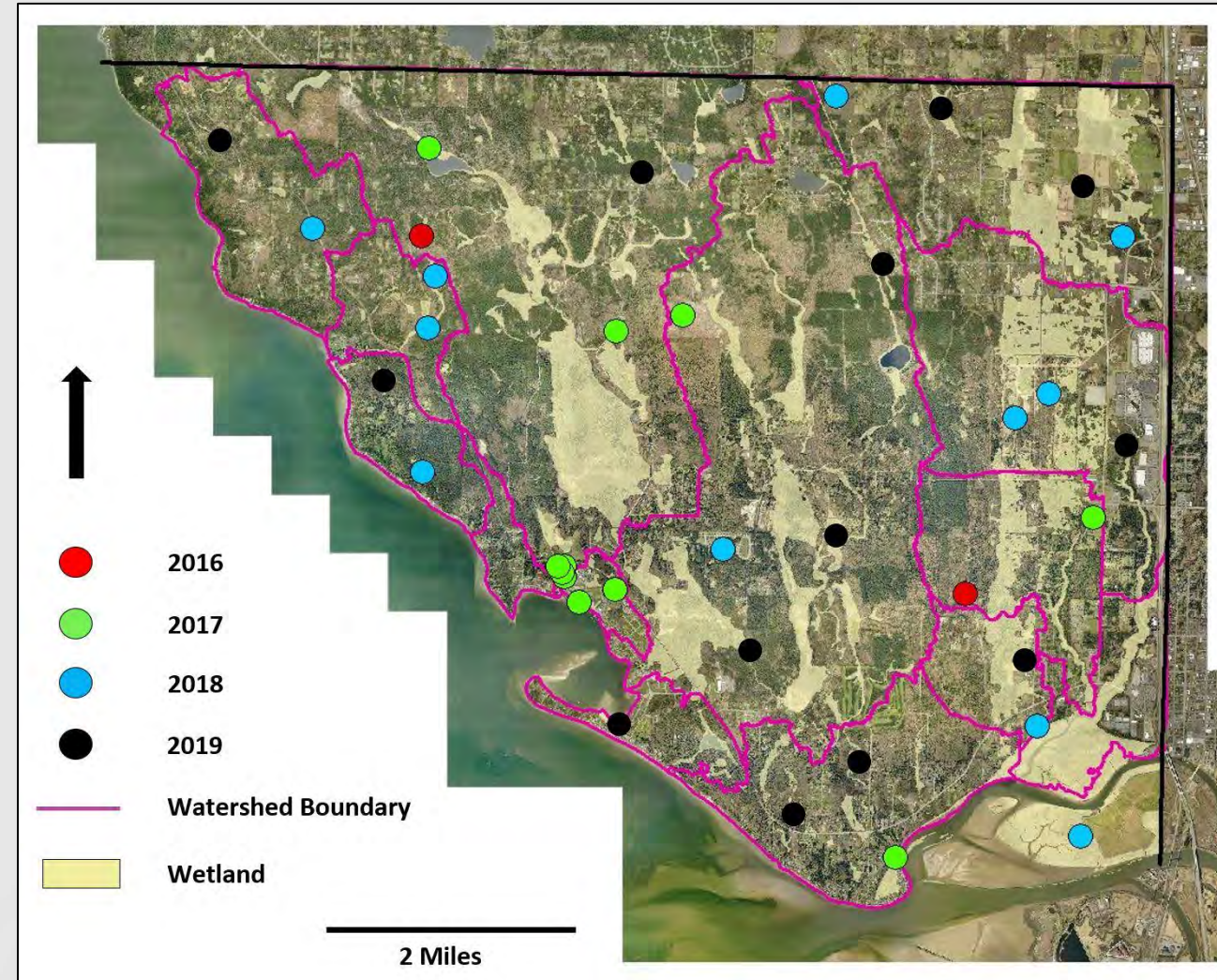
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# Wetland Monitoring and Assessment

## Cultural Assessment: Site Specific - Checklist



### Wetland Cultural Values Checklist

- draft -

Site ID [REDACTED] Personnel J.Hall, H.Zox Date 7/14/17

Value	Subset	Indicator/Metric	Presence/Absence	Notes
Tribal Heritage	Plant Use (1 + 2) (wetland supports plants used in cultural activities)	Food (1&2)	P	wapato
		Textile (1&2)	P	marsh plants
		Medicine (1&2)	P	
		Ceremonial (1&2)	P	
		Prayer (1&2)	P	
		Uncommon on Reservation (1)	P	lake, marsh
	Fish/Wildlife Use (1&2) (wetland supports fish and/or wildlife used in cultural activities)	Food	P	trout, deer
		Textile	P	furbearers
		Medicine	P	
		Ceremonial	A	
	Historical Use (1&2)	Prayer	P	abun. wildlife
		Identified Cultural Significance	P	
	Water (1)	Open	P	lacustrine
		Running	P	inlet/outlet
Quality		P		
Remote (1)	People	A		
	Noise	A		
Non-Typical on (1) Reservation	Marsh, etc	P		
Slated for Restoration/Enhancement/Protection (1)	Comp Plan	P	possible lease termination	
Other	Research and Education (1)	Water Quality Monitoring Stations	P	annual, Tribe
		Current known usage	A	
	Uniqueness (1)	Natural Heritage	A	

**Notes:** All Indicators/Metrics will be assigned a Boolean value (0 or 1) based upon presence/absence.

- (1) NRD to complete this
- (2) Cultural to complete this

Wildlife Observed 7/14/17: beaver, bald eagle, osprey, kingfisher, passerines common, hummingbird, trout, deer, Canada geese, mallard



## Wetland Monitoring and Assessment

### Plant Species: Accessibility to Tribal Members

Wetland T*****c		JHall, H. Zox, Z. Lamebull		July 14, 2017	
Sci Name	Common Name	Abundance	Accessibility		
<i>Rubus spectabilis</i>	salmonberry	high, fruit	1		
<i>Rumex obtusifolius</i>	bitter dock	low	5		
<i>Sagittaria latifolia</i>	Wapato	low	3-4		
<i>Salix sitchensis</i>	Sitka willow	low	4		
<i>Sambucus racemosa</i>	red elderberry	low	2		
<i>Scutellaria galericulata</i>	marsh skullcap	low	3		
<i>Solanum dulcamara</i>	bittersweet nightshade	low	3-4		





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### Accessibility Scale 1 to 5

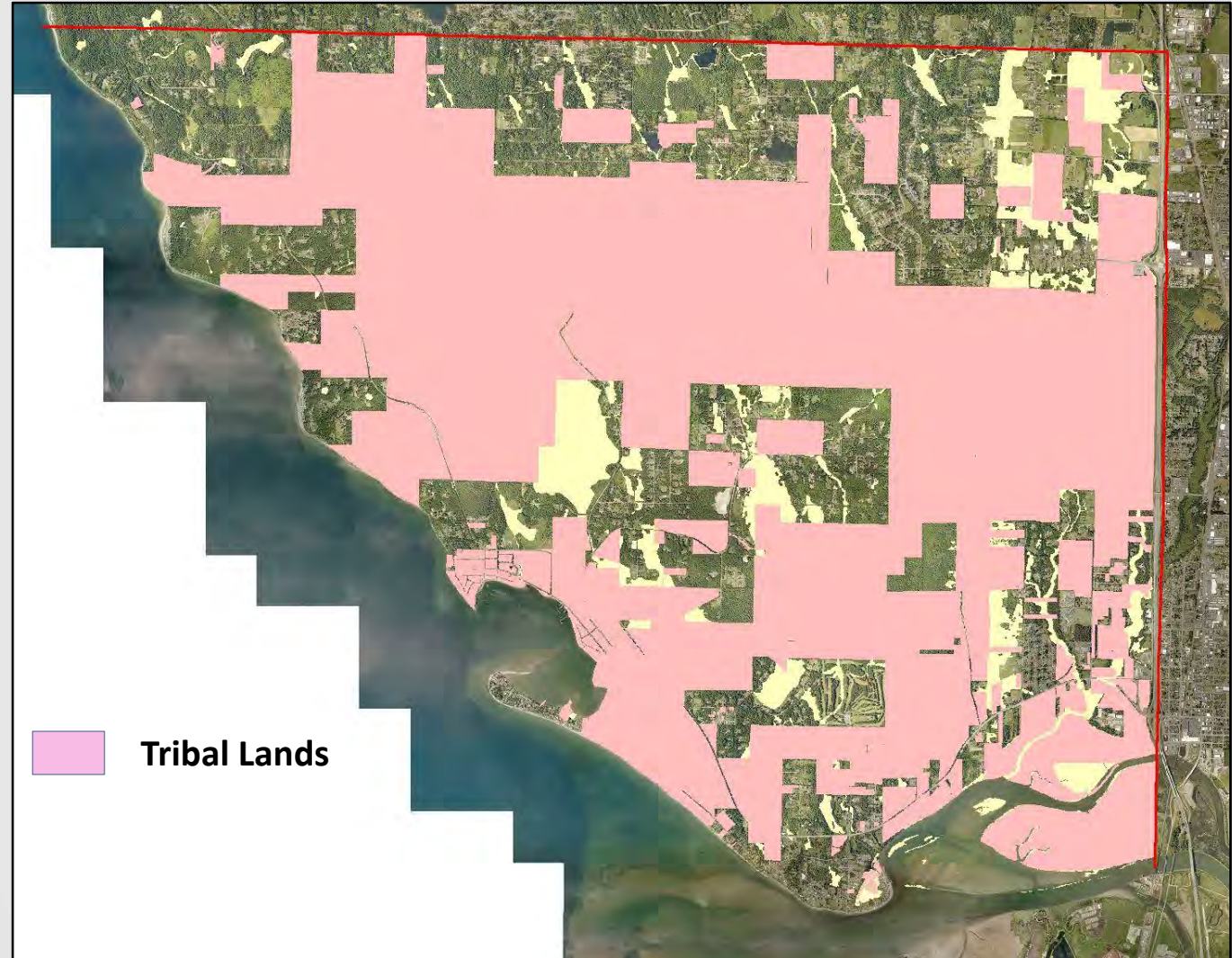
**Example: 1** = “Accessible to elders; <0.25 mile from nearest open road, flat to gentle slope, and walking shoes okay.”





## Incorporation of Cultural Values and Traditional Knowledge in Other Tulalip Programs

### Acquisition







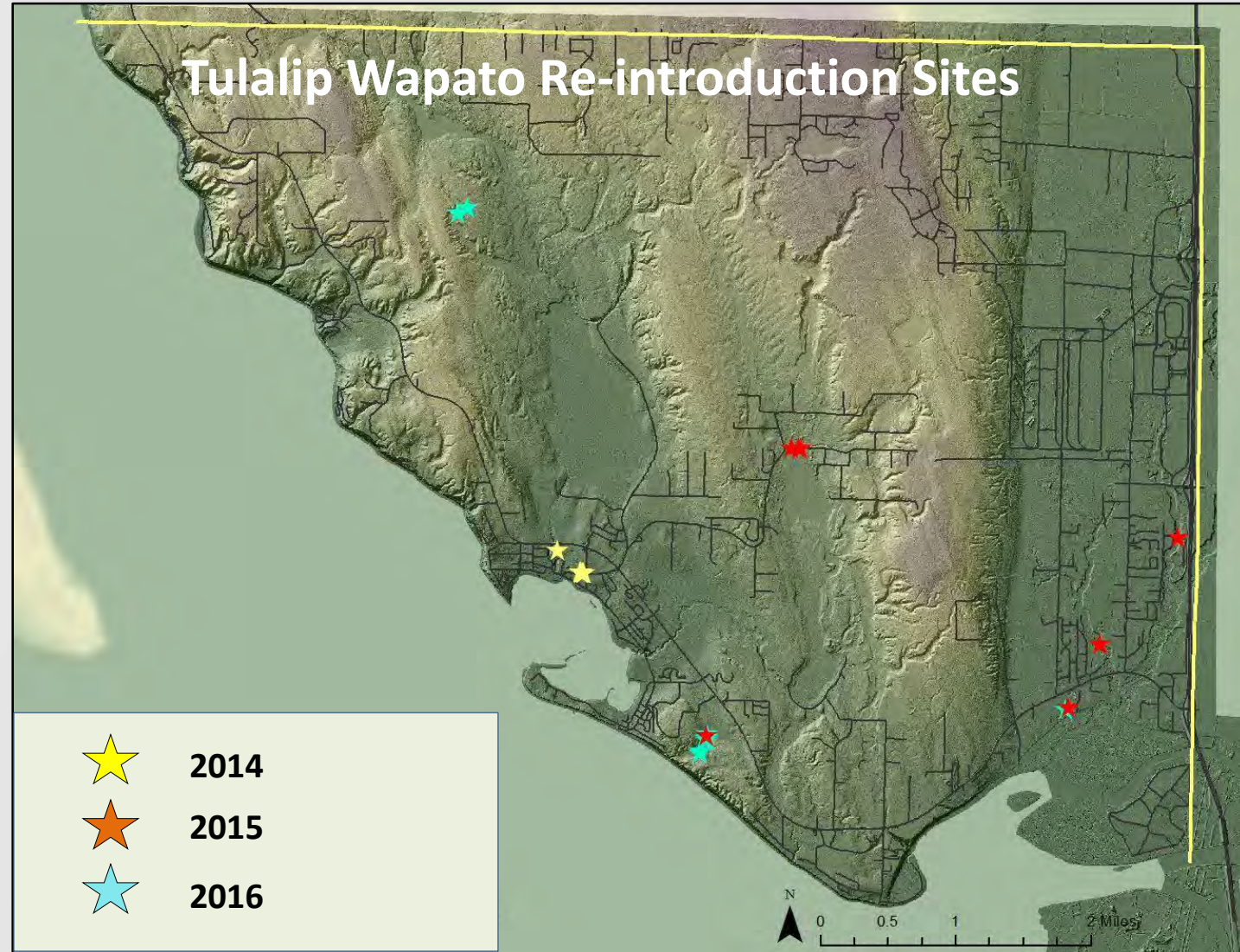
## Incorporation of Cultural Values and Traditional Knowledge in Other Tulalip Programs

Acquisition

**Restoration**



Wapato plant with leaf, roots, and corm







## Incorporation of Cultural Values and Traditional Knowledge in Other Tulalip Programs

Acquisition  
Restoration  
**Regulation**



### **Tulalip Tribal Codes**; Excerpt from **Section 7.110.050 Wetlands**

(2) Wetland Categories. The following wetland categories shall be established:

(a) Critical Value Wetlands (Category I). Those lands which meet any one of the following 6 criteria:

**(i)** The presence of species (plant, animal, or fish) listed by the Tulalip Tribes or other resource management agencies as threatened or endangered, or the presence of critical habitat documented by the Tulalip Tribes for those species.

**(ii)** Regionally rare and unique native wetland communities, including sphagnum bogs and fens, and estuarine wetlands.

**(iii)** Wetlands having direct impact on the protection and production of Tribal fisheries enhancement projects as identified by the Tulalip Department of Environment.

**(iv)** Wetlands having cultural and/or spiritual significance to Tulalip Tribal members.

**(v)** Irreplaceable wetland systems performing critical ecological functions.

**(vi)** Wetlands having exceptional habitat value and diversity as defined by the following characteristics:

(A) those wetlands equal to or greater than five acres in size and having three or more wetland classes, one of which is open water; or (B) wetlands having 40 to 60 percent permanent open water in dispersed patches with two or more wetland classes and connected to another habitat area, either upland or aquatic, via a stream or vegetated corridor.





## Incorporation of Cultural Values and Traditional Knowledge in Other Tulalip Programs

Acquisition  
Restoration  
Regulation

**Education**

HIBULB CULTURAL CENTER & NATURAL HISTORY PRESERVE  
dxʷʔal kʷi ɡʷəslaχdxʷčəł "So we can remember"



### Rediscovery Program

Mission is to revive, restore, protect, interpret, collect and enhance the history, traditional cultural values and spiritual beliefs of the Tulalip Tribes

**Examples:** Classes, film series, field trips and educational materials on gathering and preparing plants for food, medicine, and weaving

Classroom Instruction: Traditional Uses of  
Plant Material





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*"Marsh tea grows in peat bogs, a special environment; we have to safeguard that tea and places where it grows"*

**Inez Bill**, Rediscovery Coordinator







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*"Nettle was a staple for our people for hundreds of years; it has tremendous health benefits."*

**Inez Bill**, Rediscovery Coordinator





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Cedar Bark Collection, Tulalip  
Reservation





## 2018 – 2019 Activities

- **Update Tulalip Wetland Program Plan**
- **Continue comprehensive update of Tulalip Wetland Inventory**
- **Additional Sites: Wetland Monitoring & Assessment Program**
- **Produce Reservation–specific Planting Guides (e.g., brochures) for landowners: riparian and wetland sites**
- **Tribal Codes Updates including Environmentally Sensitive Lands (e.g., Wetlands)**