

Wetland Management and Restoration for the Pyramid Lake Paiute Tribe



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Robyn Mercer, Wetlands Specialist
Pyramid Lake Paiute Tribe: Natural Resources
Department

Outline

- Introduction
- Incorporating technology
 - Development of online platform for education and outreach
 - ESRI applications, GIS
 - Monitoring
- On-going project work
 - Wetland monitoring and assessment
 - Tribal herbarium and native seed bank
 - Northern leopard frog (*Lithobates pipiens*) demonstration project
 - Numana non-point source project

Introduction

- **Pyramid Lake Paiute Tribe (PLPT)**
 - Located 35 miles northeast of Reno, Nevada
 - Reservation is approximately 477,000 acres
 - 112,000 acres of lake surface
 - Lower Truckee River
 - Empties into Pyramid Lake
- **Diverse landscape**
 - Varying wetland habitats



Pyramid Lake Paiute Reservation

Map of all wetlands identified and monitored currently on the Reservation

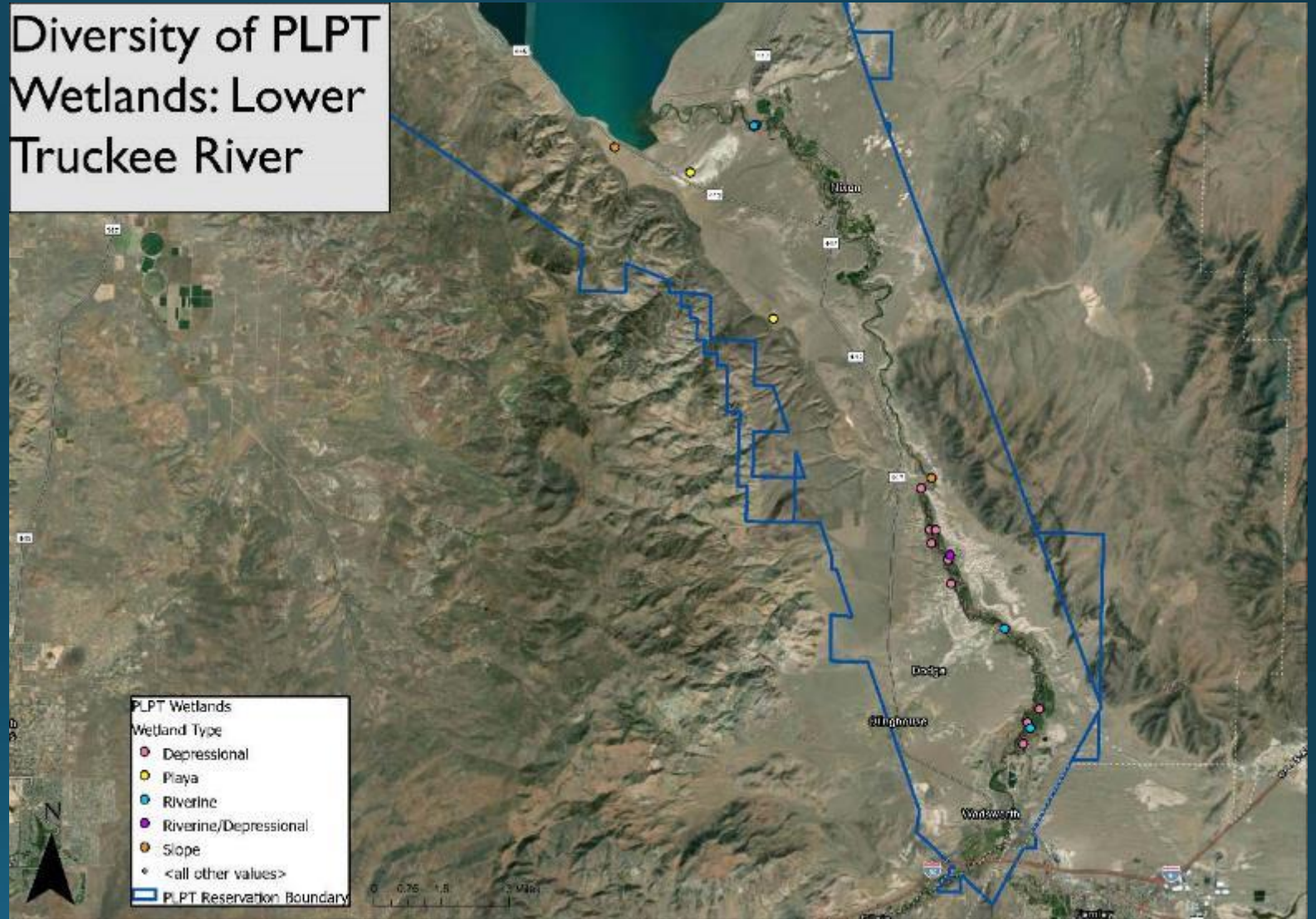


Map depicting the wetland types on the Reservation



Map of the lower Truckee River.

Showing the diversity of wetlands along the Truckee River, and the southern portion of the Reservation



PLPT Wetlands Program

- **Main priorities**
 - Protect and restore wetlands on the reservation for their economic, cultural, environmental, and human health benefits
- **Continued work**
 - Monitoring and assessments
 - Northern leopard frog project
 - Herbarium and seed collection
- **Efforts to expand and grow the program**
 - Technology
 - Outreach/education



PLPT Wetlands

- Total of 22 identified wetlands
 - Four have been lost due to flooding and erosion events on the Truckee River
 - 19 are monitored and assessed today
 - Consist of:
 - Slope, depressional, playa, and riverine wetland types
 - Geographically isolated (spring-fed)
 - Constructed and natural
 - Working to identify more
 - Developed and established riverine
 - Spring-fed



*Technology to
enhance wetland
program capacity*

Incorporating technology into wetlands program work

① Develop internet-based/cross-platform wetlands application

② Use software to collect continuous hydrology and precipitation data in wetlands

① Develop interactive internet-based wetlands application

- Purpose

- Share information with numerous individuals
- Engage and interact with users
- Highlights of program
 - Technical work
 - Historical and cultural aspects

- ESRI Storymap application

- Cross-platform
- Allows the use of maps, images, writing, videos, etc. on one platform
- Creative and innovative ways to present information and engage with individuals

PLPT Wetlands Program Storymap

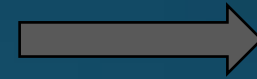
Development/Experience

- Ability to change and update as needed
- Interactive and engages with audience
- User-friendly
- Endless development possibilities

Storymap
overview:
Major aspects of the
wetlands program



Monitoring,
assessments, and
surveys



Restoration
projects



Vegetation
collection:
Herbarium and
seed bank

Storymap objectives

Education

Interaction and engagement

Public outreach

Cultural aspect

Incorporates

- Wetland basics and functions
- Pyramid Lake wetlands
 - Locations, types, maps
- Riparian and wetland vegetation
- Amphibians
- Nature Trail
- Wetland restoration at Numana
- Cultural aspects
 - Language, stories, cultural uses of wetlands
- Outreach events and opportunities

Using

- Various maps (GIS and/or google earth)
- Videos
- Drone photos and footage
- Images and field photos
- Historical documents
- Updated data

Storymap examples

Image 1



- Different basemap options as seen in images #1 and #2
- Create maps to utilize in storymap using ArcGIS Online

Image 2



- Change symbology to show different representations of data

Image 3



- Create a "guided tour"

*Technology
improvements to
data collection*

② Wetland hydrology monitoring

- Use of HOBOWare software for **continuous monitoring**
 - Groundwater elevation levels
 - Precipitation gauge
 - Continuous hydrologic monitoring
 - Collecting data on 1 hour intervals
- Download data onto computer
 - Graphed data/analysis
 - Can correct and analyze data

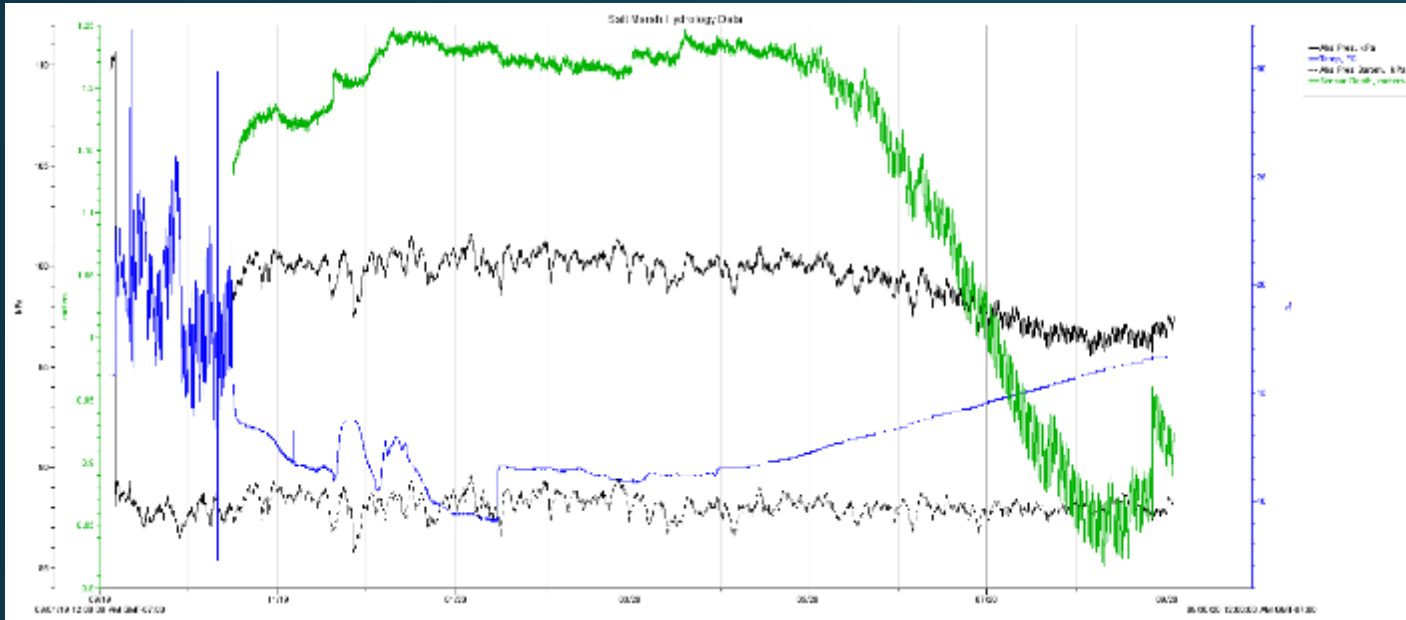


Wetland hydrology monitoring

- Two representative sites chosen in 2018
 - **Soda Springs** (spring-fed, isolated wetland in Smoke Creek Desert)
 - **Salt Marsh** (adjacent to lower Truckee River)
- HOBOWare software at each site
 - HOBO rain gauge
 - HOBO water level sondes
 - Temperature and barometric pressure shifts
- **Understand and interpret**
 - Flow, frequency, duration, and water table elevation fluctuations
 - Differences in sites
 - Long-term trends
 - Useful for management decisions in future

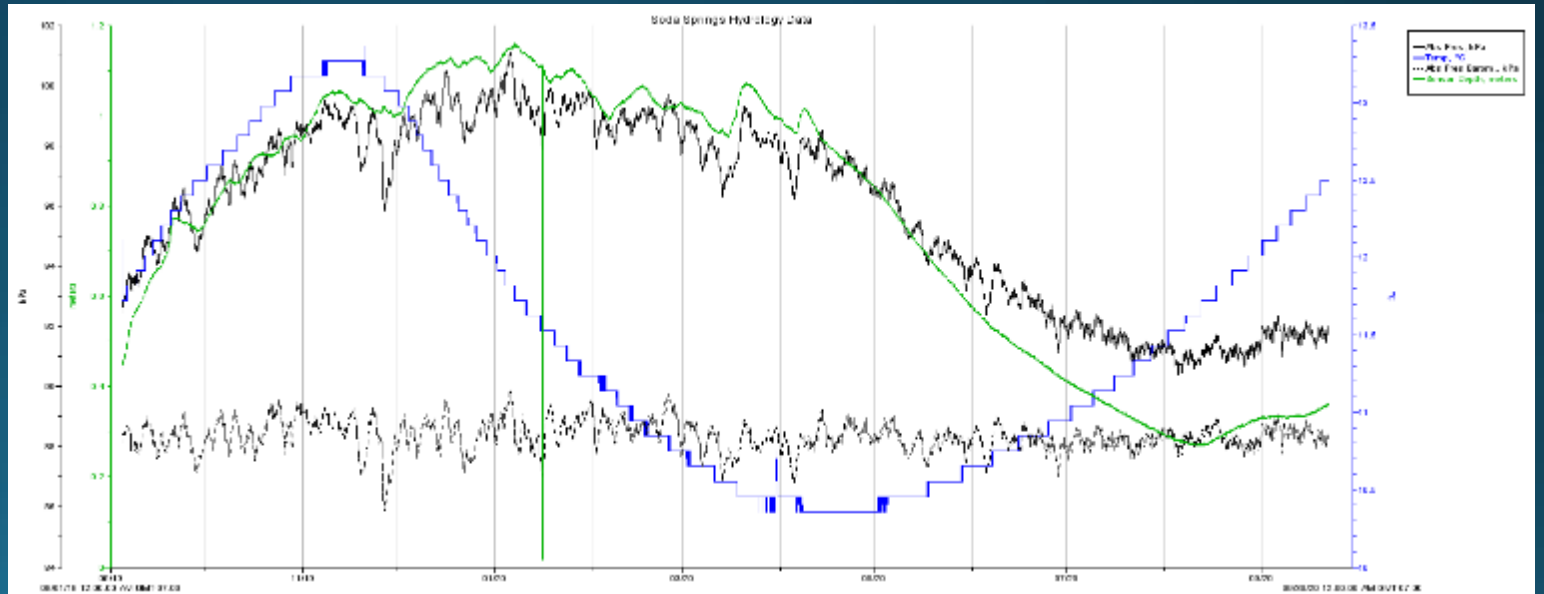


Groundwater data



Salt Marsh hydrology graph from September 2019- Septemeber 2020

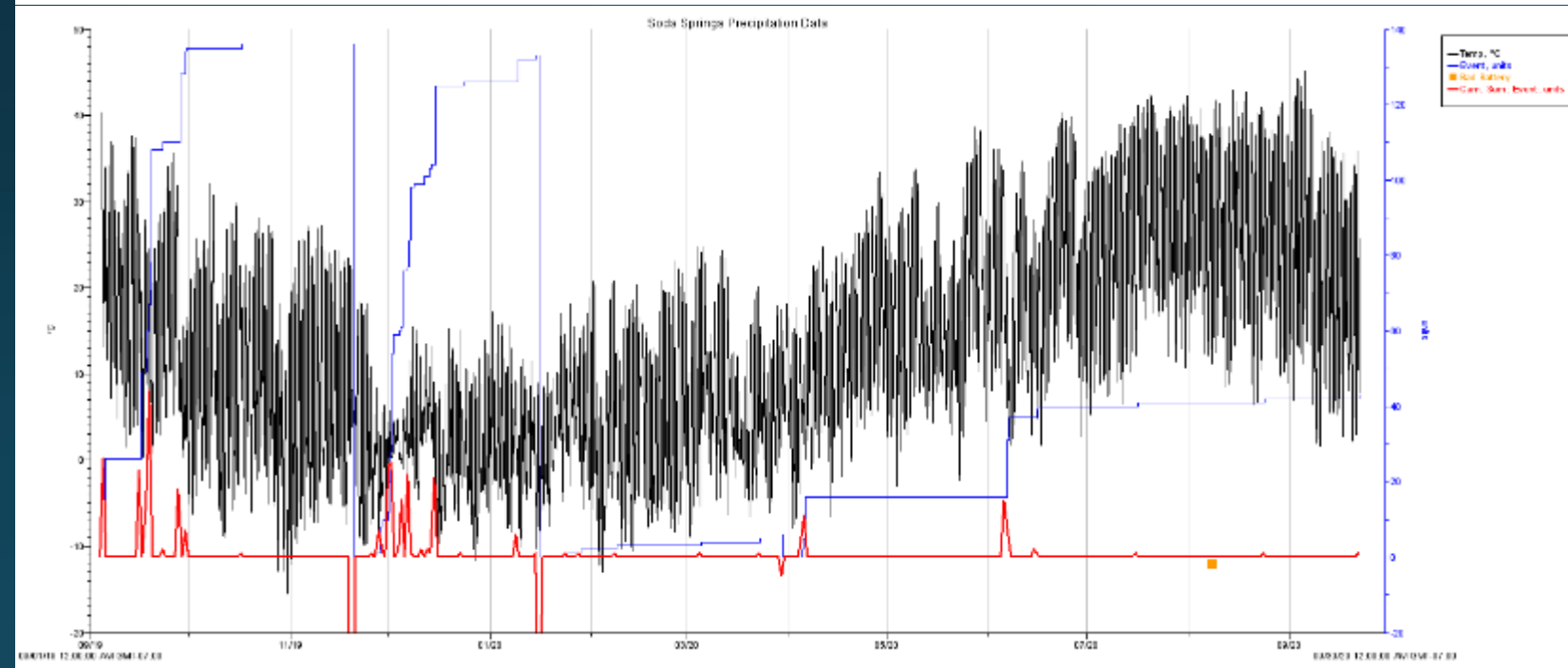
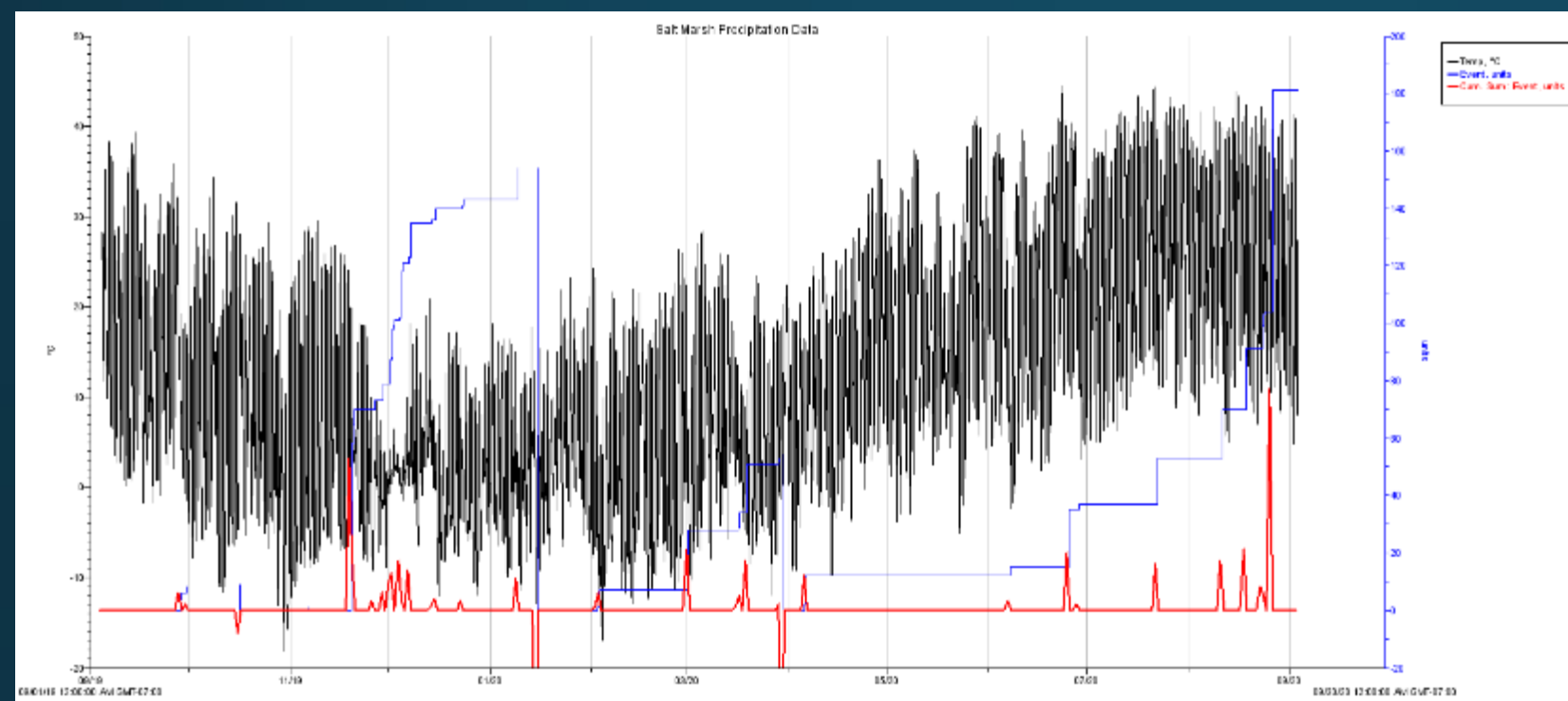
Soda Springs hydrology graph from September 2019- September 2020



Precipitation data

Top image: Salt Marsh precipitation graphed from September 2019- September 2020

Bottom image: Soda Springs precipitation graphed from September 2019- September 2020



Wetland Program on-going work

Updates and outcomes

Mapping newly developed riverine wetlands

- Changes to the lower Truckee River Corridor
 - Recent flooding and erosion events on the Truckee River
 - Followed by non-flooding years
- Loss of 3 previously identified Riverine/ Depressional wetlands
- River corridor has established since flooding events
 - New wetlands and channels
- Identifying potential wetlands
 - Google Earth
 - Inventory in the field

Lower Truckee River 2015



Lower Truckee River 2019



Comparison of river corridor changes

❖ Truckee River near monitored wetland location

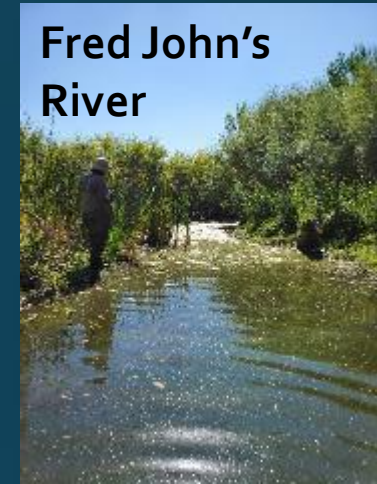
Google Earth image from 2015



Google Earth image from 2019



Identified riverine wetlands



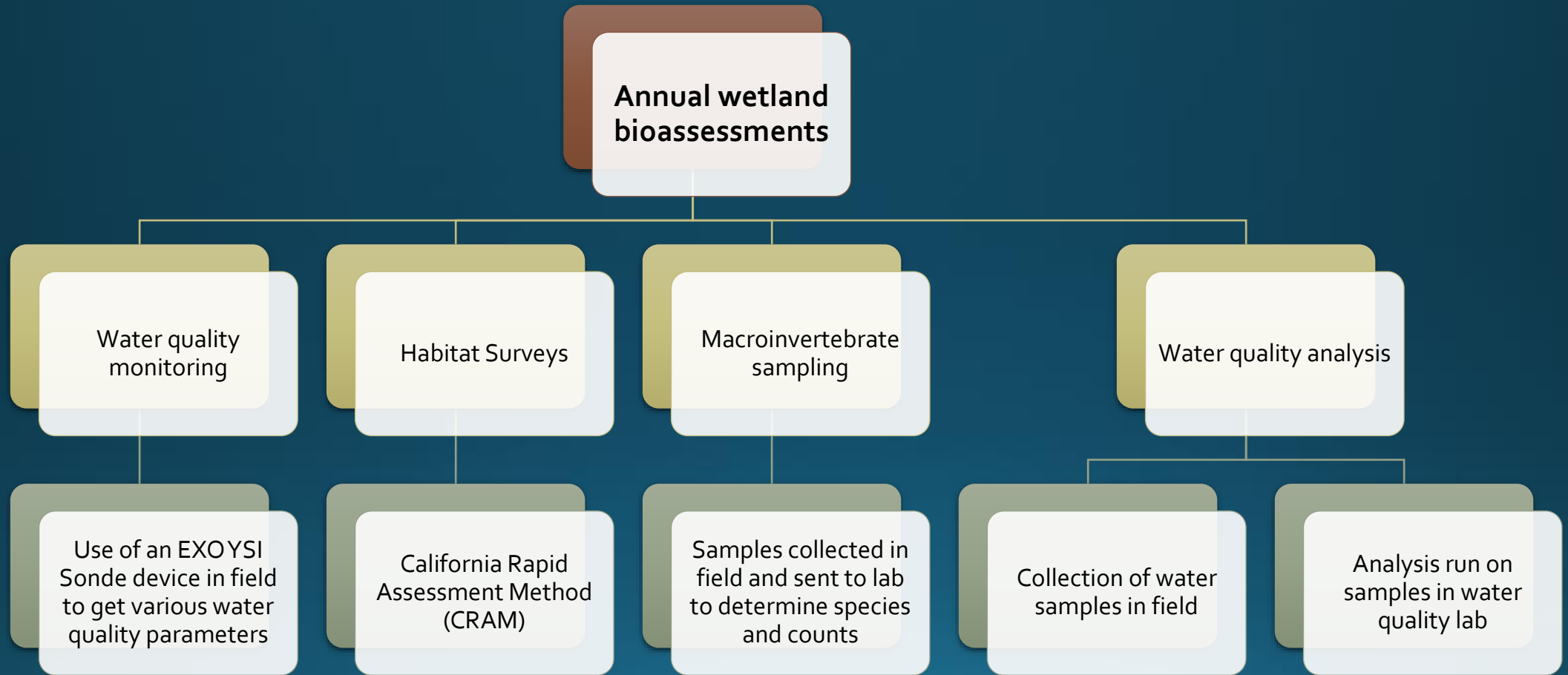
Marble Bluff Dam Down

Marble Bluff Dam Up



*Annual wetland
program work*

Wetland Condition Assessments



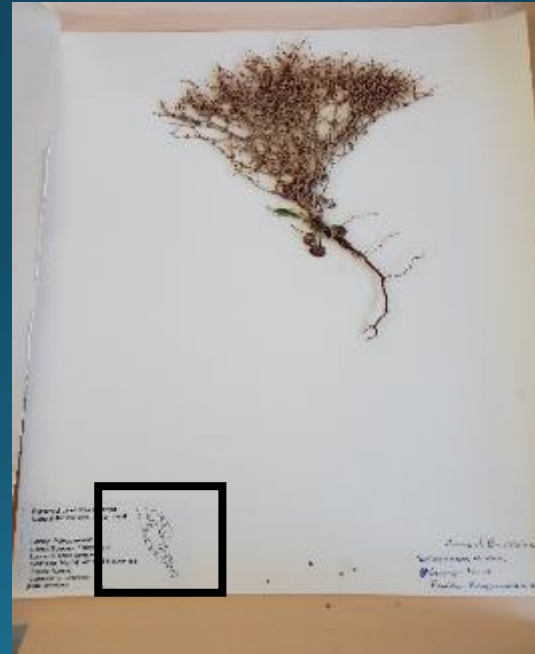
Tribal Herbarium

- Collect specimens in field
- Document
- Take photo

- Press specimen
- Label with information

- Example of herbarium specimen
- Map with coordinate of specimen collection site

- Useful for staff
- Cultural resource
- 64 total specimens
- 2020 season: +20



Native Seed Bank

- Collection of native seeds on reservation
- Store in fridge for **restoration** purposes in future
- **44** bottles of seeds, adding **5-10 more bottles** from **2020 season**

Seed Collection Events

- Public Lands Day with BLM
- Involvement with community
- Share updates on restoration efforts using native seeds
- Significantly more seed collected with additional individuals



Northern Leopard Frog Demonstration Project

- Extirpation of the Northern leopard frog (*Lithobates pipiens*) from the Truckee River Watershed
 - Remaining populations found on one area of land in Wadsworth, NV
 - Various causes of declines in populations
 - Declared a “species of concern” for the PLPT
 - Need to determine extent, density, and distribution of the populations on the Reservation
 - Determine best management practices for species
 - Re-introduce into additional wetlands
 - Increase populations

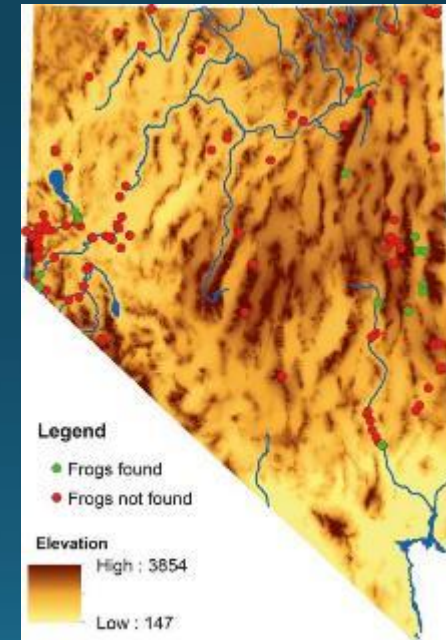


Image from the article: “The disappearing northern leopard frog (*Lithobates pipiens*): conservation genetics and implications for remnant populations in western Nevada”

Locations of Northern leopard frog populations. Located in three wetlands on one property

*Sightings of Northern leopard frogs have occurred, but no additional populations have been detected

Northern leopard frog known locations



Conservation efforts for the Northern leopard frog (NLF) population

- Determine extent, densities, and distribution
 - Amphibian surveys
 - Call surveys
 - Egg mass surveys
 - Visual encounter surveys
 - Amphibians in any stage of metamorphosis, from tadpole to adult
 - Capture, data collection, release
 - *Bd swabs if available and if possible
 - Determines what amphibian species reside on the Reservation
 - Necessary habitat requirements for NLF
- Invasive species impacts
 - Bullfrog introduction
 - Eradication efforts



PLPT Wetlands Program goals and future work

- Continue education and outreach efforts
 - Technology and partnerships with other agencies
- Restoration projects to strengthen condition of wetlands on the Reservation
- Hydrology monitoring
 - Further work on using the data collected
 - Identify trends
 - Add additional monitoring locations
- Herbarium and seed collection
 - Continue collection of plants to grow herbarium
 - Collect varying species of seed every year to grow seed bank
 - Begin re-planting of the seeds

Thank you

- Contact Information:
 - Robyn Mercer
 - Email: rmiller@plpt.nsn.us
- Wetlands Program website:
 - plptwq.org/wetlands
 - Storymap will be uploaded to website page in near future

