USGS
science for a changing world

Movement and Habitat Use of Northwestern Pond Turtles in Willamette Valley Project Reservoirs

Jennifer Fredrickson[1], Michael Adams[1], Christopher Pearl[1], and Kathleen Smith[2]

[1]USGS Forest and Rangeland Science Center

[2]US Army Corps of Engineers Environmental Stewardship Section

U.S. Department of the Interior
U.S. Geological Survey

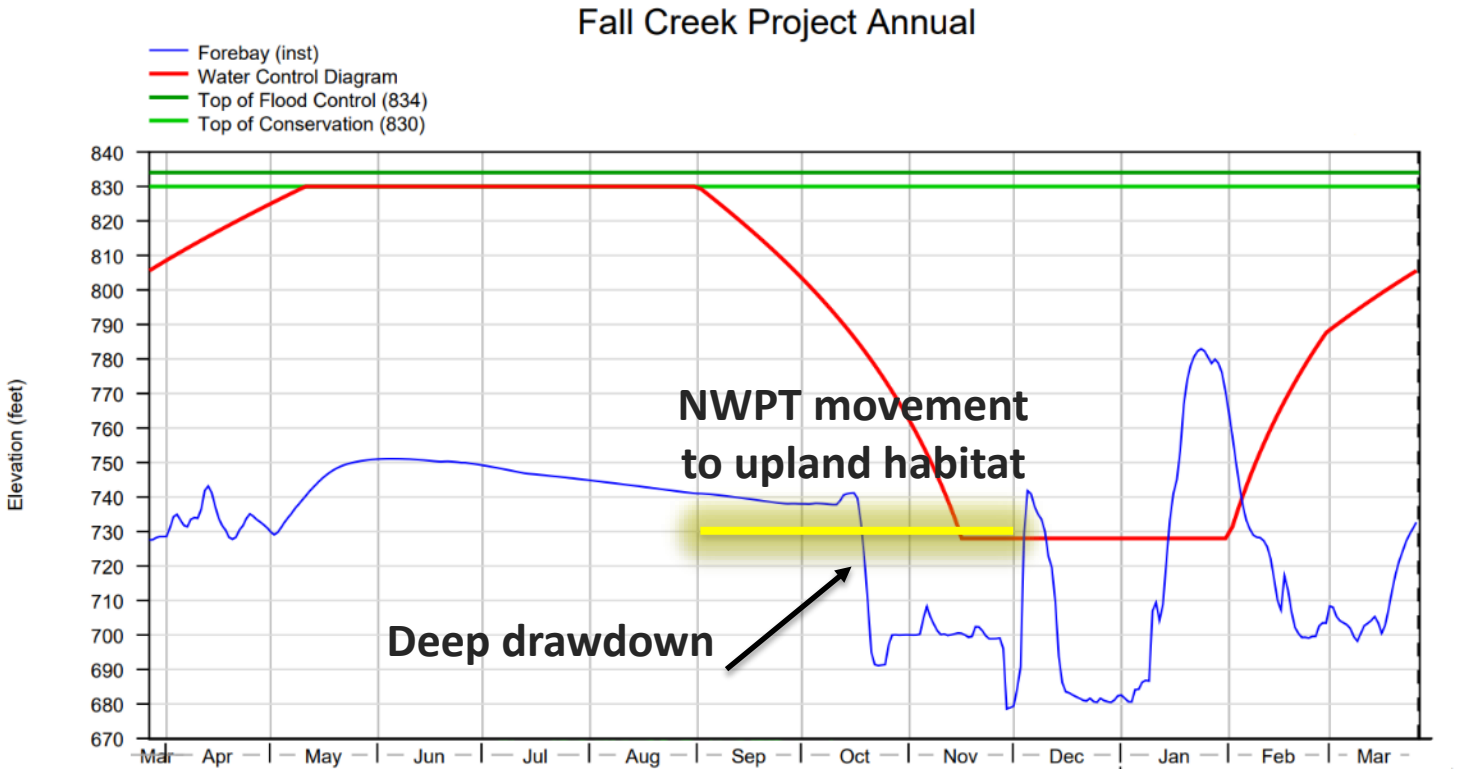
Project Background

- **Northwestern pond turtles (NWPT) have been a focus of WVP biologists since the 1990s, driven by:**
  - **State and potential federal status**
  - **Limited understanding of turtle movement and behavior in reservoirs**
    - **NWPT annual lifecycle requires both aquatic and terrestrial habitats**
    - **Seasonal migrations may coincide with reservoir drawdown and refilling schedules**

- **Court injunction in 2021 may have implications for NWPT due to altered water management**

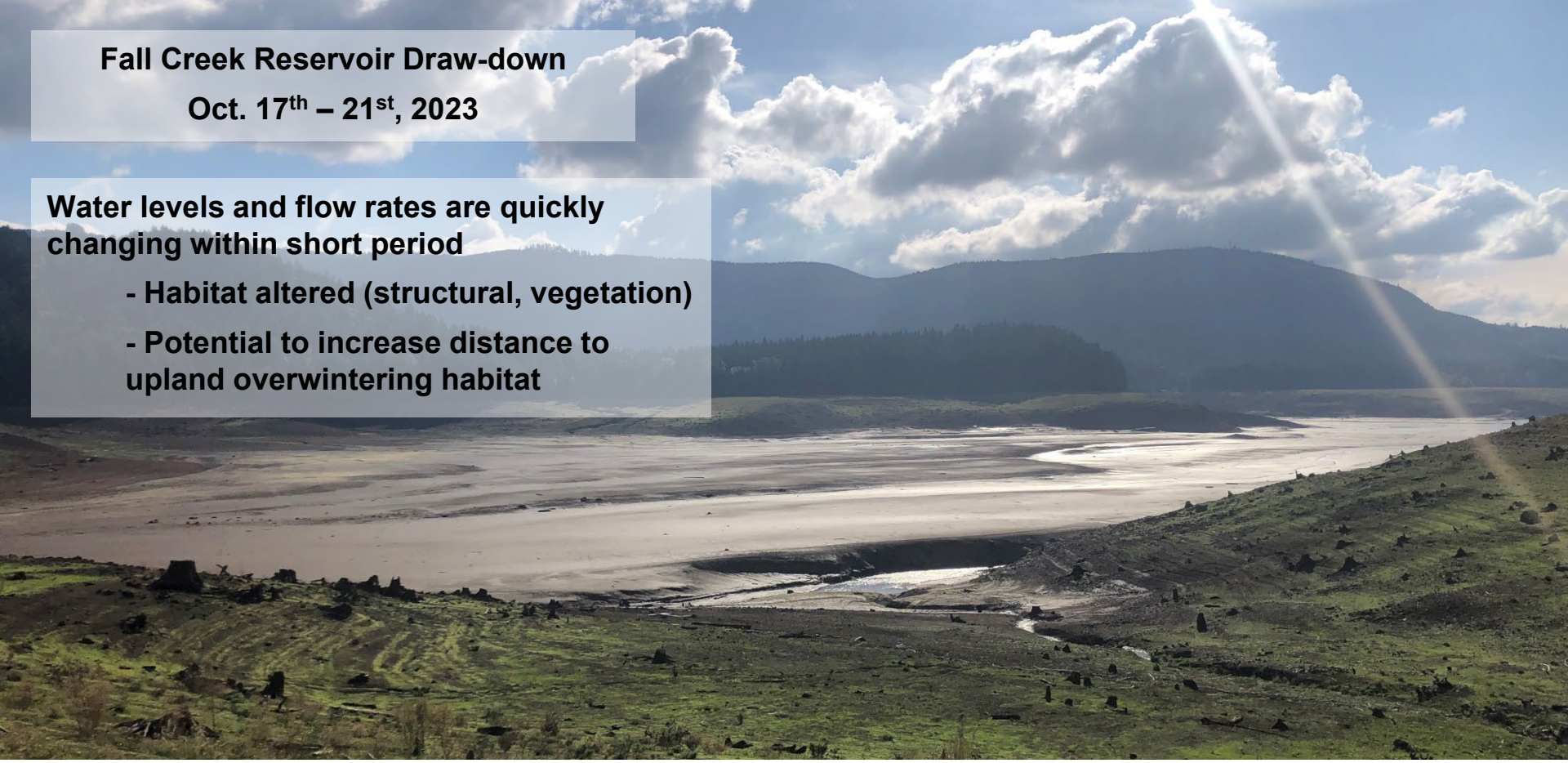
USGS

What's Happening (and when)?



USGS

This information is preliminary or provisional and is subject to revision.
The information has not received final approval by the U.S. Geological Survey (USGS).



Fall Creek Reservoir Draw-down

Oct. 17th – 21st, 2023

Water levels and flow rates are quickly changing within short period

- **Habitat altered (structural, vegetation)**
- **Potential to increase distance to upland overwintering habitat**

USGS

Study Objectives:

- Expand baseline knowledge of NWPT in WVP reservoirs
  - Distribution
  - Population demographics & morphometrics
- Increase understanding of habitat use
  - Both within reservoir and upland
  - Identify areas of high use and high risk
- Investigate drivers of seasonal movement
  - Focusing on relationship between water level management and overwintering behavior
- Evaluate feasibility of using GPS/Satellite transmitters

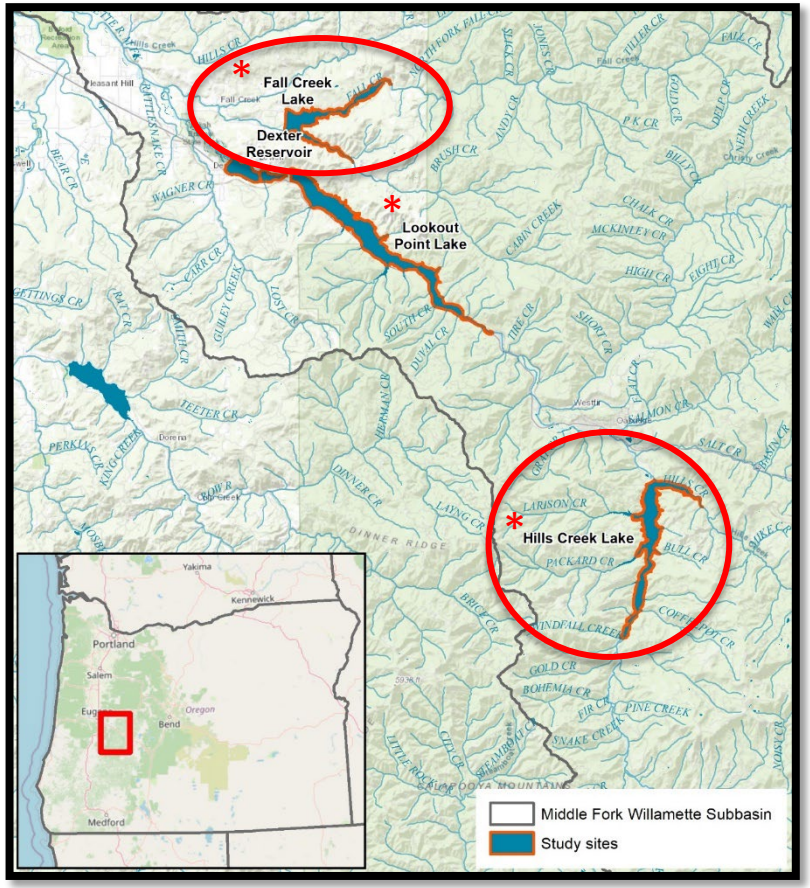
USGS

Methods:

- Trap NWPT at three WVP reservoirs
- Attach VHF transmitters to 15 adult turtles at each reservoir (n=45)
  - Test GPS transmitters on additional subset
- Track individuals year-round for two field seasons
  - Record habitat characteristics at turtle locations
  - Focus on transition periods

USGS

Study Reservoirs



This information is preliminary or provisional and is subject to revision.

The information has not received final approval by the U.S. Geological Survey (USGS).

Trapping Effort

- Peak trapping season is May-July
  - Capture turtles using baited hoop traps
  - Traps checked every 24 hrs
- Traps set in 3-4 areas of each reservoir
  - Areas differed in way habitat would change as water levels adjusted
  - We considered sites with varying slopes and aspects
  - Learning process – adjusted as we went

USGS

Captures: Population Demographics

- We captured 62 NWPT total
  - 24 adult males
  - 15 adult females (4 gravid)
  - 4 unknown adults
  - 19 juveniles
- No visual evidence of disease or individuals in poor body condition
- Age estimated using annuli
  - Annuli visible up to ~15yrs in northern range

USGS

Captures: Morphometrics

- **All individuals were photographed, measured, and weighed upon capture**

USGS

Captures: Unique Identification

- Individuals were given a unique shell mark
  - Marginal scutes are notched using a file
  - Same marking system as previous USACE studies
  - Marks considered permanent/ last many years
- Juveniles under a certain size given non-permanent ink marks

USGS

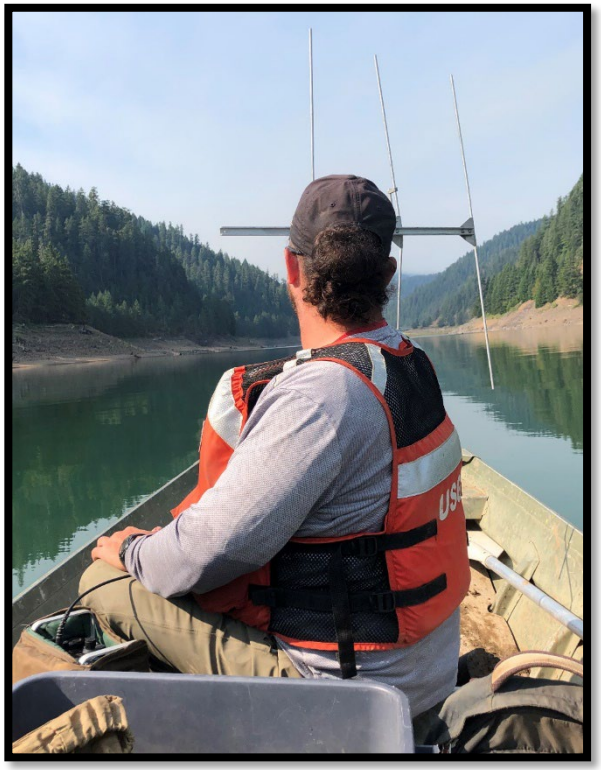
Transmitter and iButton attachment

- Units attached weighing <10% of body weight
  - Average 5-6%
  - Surf epoxy
- Placement considered breeding, effects on balance and movement
- Camouflaged to match turtle coloring

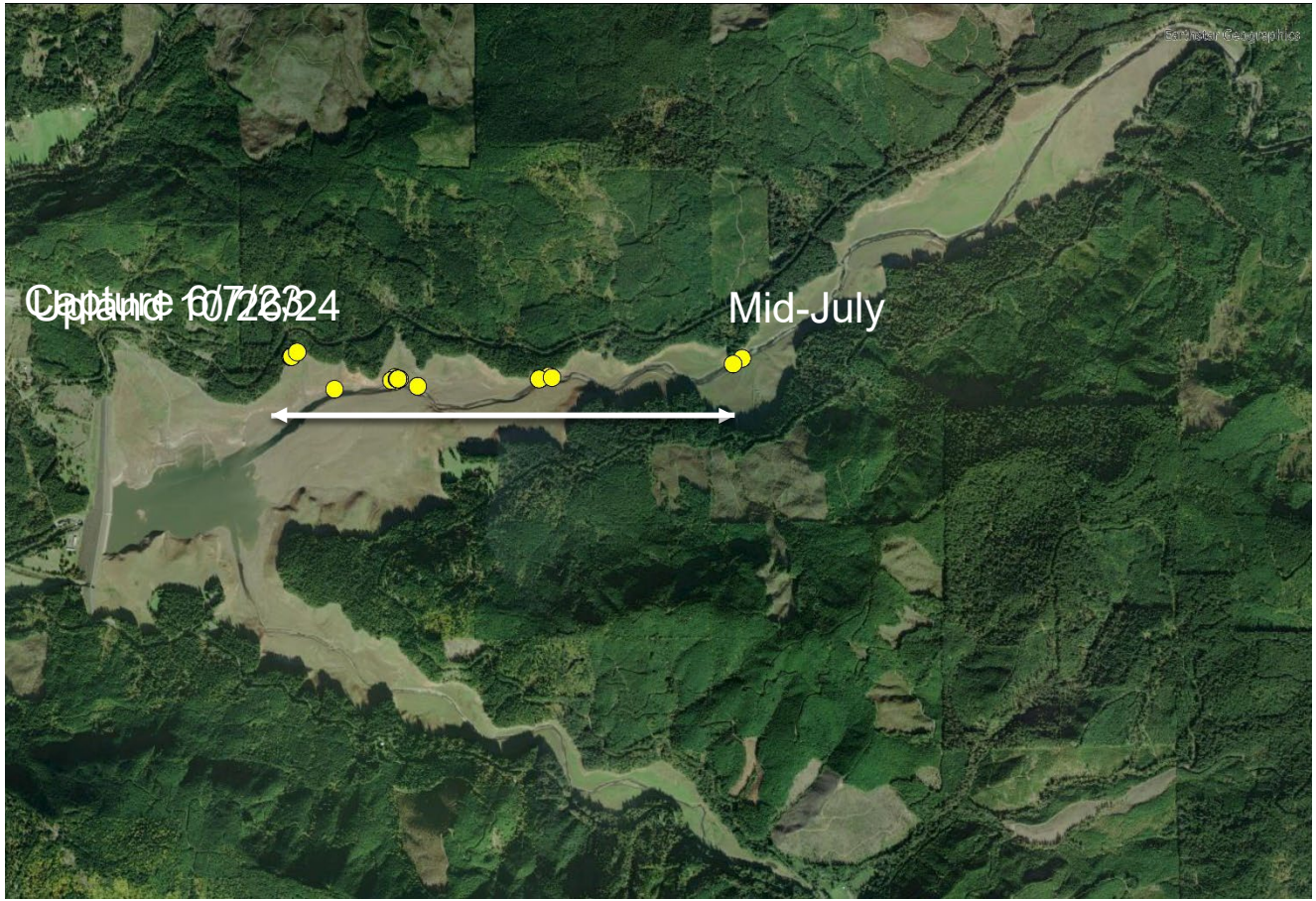
USGS

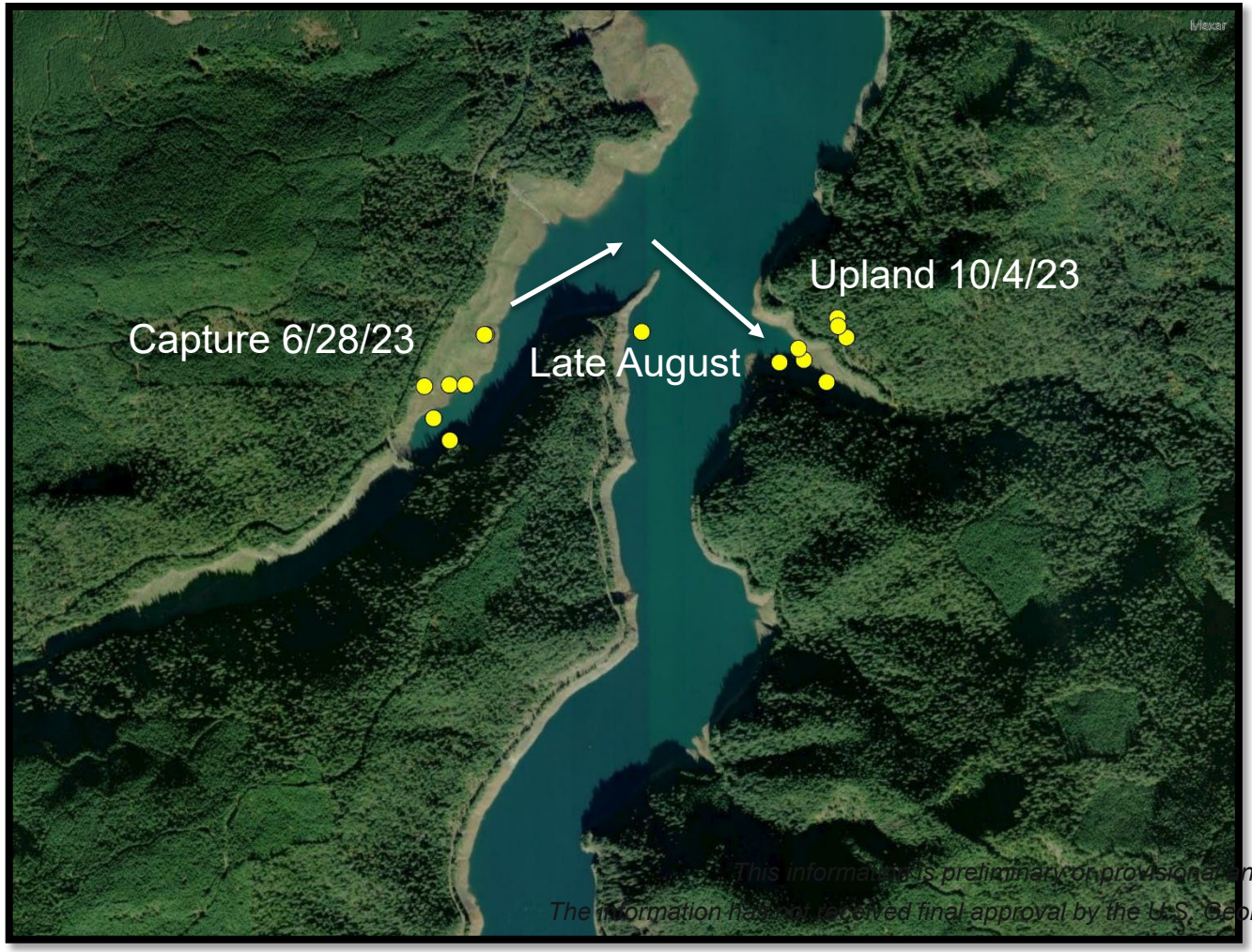
Telemetry: Summer Movements

- Turtles were relocated 1x per week
- Microhabitat characteristics and photos
- Individuals capable of large movements
    - Travel along shorelines typical



USGS



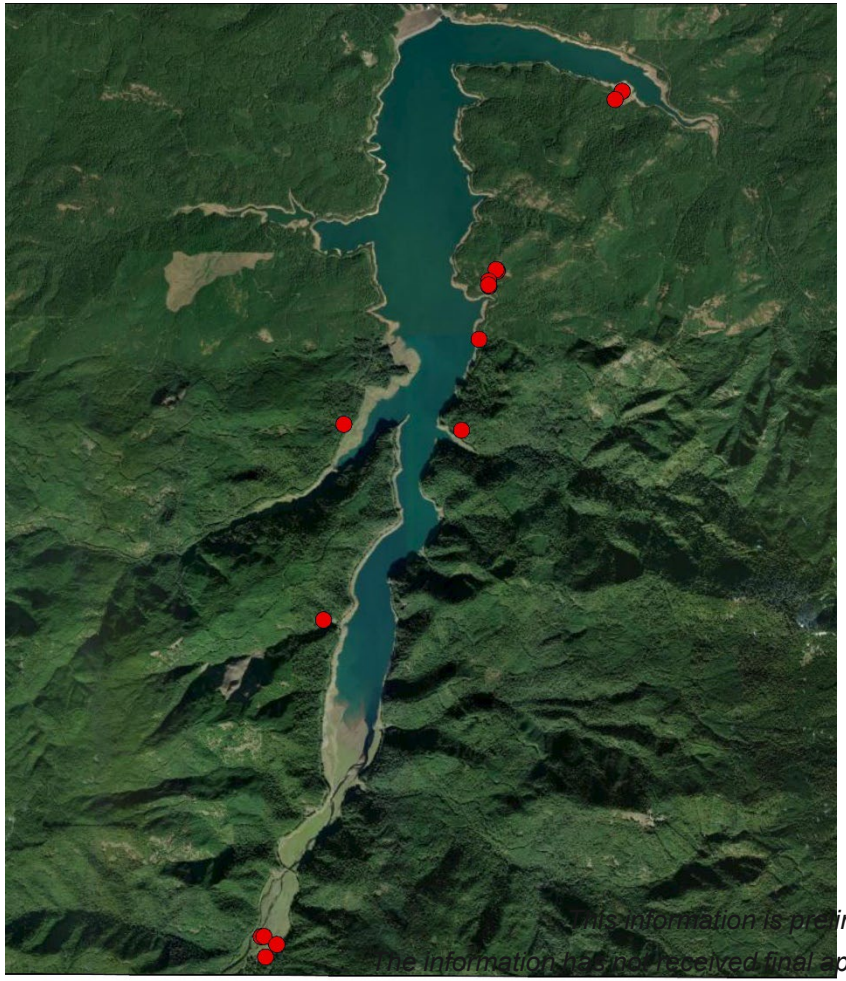


Overwinter Transition

- Upland movement began in late August
  - Staging behavior prior to movement
  - Peaked late September to mid-October
  - Several turtles were found in process of moving
- One individual in our study struck by vehicle

USGS

Hills Creek Overwintering Locations



This information is preliminary or provisional and is subject to revision. The information has not received final approval by the U.S. Geological Survey (USGS).

Overwintering Locations

- Majority of NWPT returned to area of capture to overwinter
- Average turtle traveled less than 500m
  - Longest movement ~750m
- 11 turtles crossed a road (35%)
- Most chose slopes facing South or Southeast
- Used a variety of cover types

USGS

Telemetry: Spring movement

- **Many turtles displayed staging behavior by mid-March**
  - **Moving closer to forest edge, unburying from substrate**
  - **Retained state of torpor**
- **First return to aquatic habitat recorded March 26th**

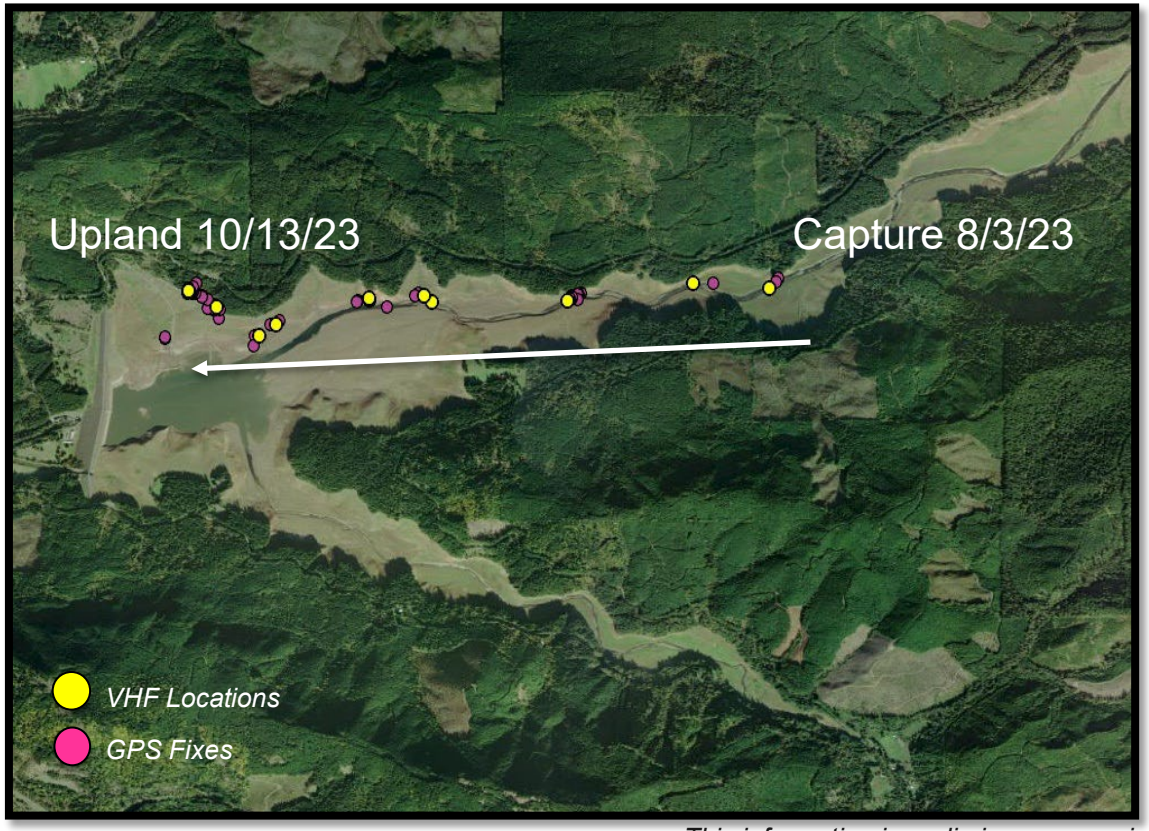
USGS

GPS Transmitters

- **GPS transmitters attached to two adult females in early August, 2023**
- **Fixes were successful for turtle at Fall Creek (25% of attempted)**
- **Batteries on both units died much earlier than expected and replaced**

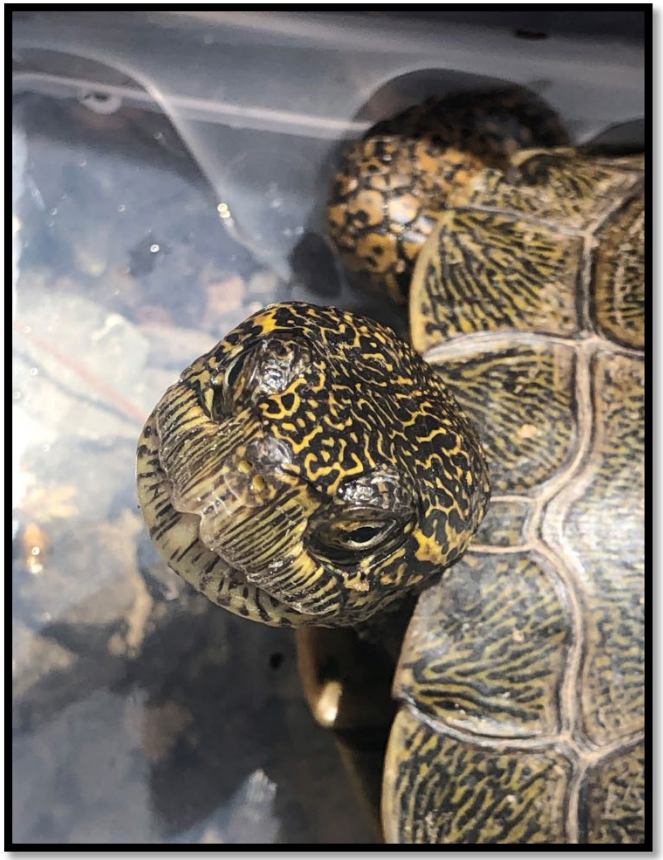
USGS

GPS Transmitters



2024 Field Season

- In 2024, Lookout Point will be added to the study
  - Attach VHF transmitters to an additional 15 adults
- Monitor success of GPS transmitters
  - Identify nesting habitat
- Test two other GPS transmitter models



USGS

Photo: Ale Martinez

Acknowledgements:
USGS – Brome McCreary, Jenn Rowe, Meredith Diskin, Nick Esser, Garth Herring
USACE – Wendy Jones, Ale Martinez, Kai Scarangella, Daniel Fararr
ODFW – Chris Yee
OPRD
Don Ashton

Contact:
Jenny Fredrickson
jfredrickson@usgs.gov
Ph: 541-750-1027

USGS