



## Marsh Magic Educator Guide

### How to Use the Prezi and Field Journal

The Wetlands Field Journal Slides were designed to be used in conjunction with the Oregon Wetlands Prezi. Students can take a virtual field trip to three wetlands ecosystems located in the South Slough National Estuarine Research Reserve, only five miles south of Charleston, Oregon. Students have access to real data collected by scientists. The students can work individually to complete the field journal or work together as a class.

Some questions are directly from the information provided, some questions are answered by reading maps and graphs, and some require critical thinking. Provided below are additional questions that are not included in the field journal. We kept these separate because we felt they may require more guidance and support to answer them. Questions with a \* are included in the field journal, but would be good questions to discuss as a group.

After the additional questions, we included some possible supplemental activities and some background information for teachers. The supplemental activities can be adapted to the ages and needs of your classroom. The background information is provided by Jenni Schmitt, one of the scientists who works directly with the data collected and presented in the Prezi. This information may be helpful for teachers who are not wetland experts and includes site specific information you can share with your students to help them make connections with the data.

### Additional Questions for Discussion

- Habitat Mapping
  - a. Landing page
    - i. Why is it important to map the different types of habitat in a wetland?
- Stream Temperature
  - a. Landing page
    - i. Why is stream temperature important?
    - ii. What happens when water temperature gets warm that is bad for wildlife?
    - iii. How would changes in dissolved oxygen impact wildlife?
    - iv. \*Why do you think “good stream temperatures” are given as below a certain temperature, and not above a certain temperature. \*
  - b. Wasson Temperatures
    - i. The error bars for all of these readings overlap, what does that tell us about our data?
- Hydrology
- Stream Habitat
- Lamprey

- a. Lamprey Distribution
  - i. Why do you think Anderson Creek has no lamprey?
- b. eDNA
  - i. What are DNA sequences? How is a DNA sample used to figure out what organism it came from?
- Beavers
  - a. Landing page
    - i. How do beavers benefit from wetland restoration?
    - ii. How do beavers modify wetland habitat?
    - iii. How important is beaver habitat to the rest of the wetland ecosystem?
    - iv. Make a hypothesis about how the presence of a dam changes wetland habitat.\*
- Wetland Plants
  - a. Landing page
    - i. How does the composition of the plant community affect the overall diversity of the entire ecosystem?
  - b. Mapping
    - i. Why do we consider invasive species bad for an ecosystem?
    - ii. Would you find a higher species richness in an area with a lot of invasive species or an area with a lot of native species?
    - iii. \*Why do you think so much of Wasson has been taken over by invasive species?\*
- Birds
  - a. Landing page
    - i. \*Which habitat has the highest species richness? Why do you think that is?\*
  - b. Marsh Birds
    - i. \*Why do you think there are more different species around in April and May?\*

### Background Information for Teachers

- Stream Temperature: Wasson specific
  - Streams often warm as they flow downstream (sunlight, air temperature exposure etc). Wasson's upstream and downstream temperatures are likely similar due to riparian cover (stream routed to south side of wetland, with southern tree cover) and fast flowing water (less time to warm up).
- Hydrology
  - **Insider knowledge:** Many wells in Wasson are often dry in summer months (i.e., the groundwater is below the bottom of the well), which is why the water depth is fairly flat-lined at 1.2m below the marsh surface. In actuality, it is likely even lower than that.
- Stream Habitat
  - Pool depth/riffles can be influenced by beaver activity (Tom's).
- Lamprey
  - Why do you think Anderson Creek has no lamprey?

- One possible explanation is that the current restored Anderson channel still hasn't accumulated enough substrate to support lamprey. Juvenile lamprey need deep fines (silts) in slow moving stream segments to burrow into as they grow.
- Beavers
  - Wasson really has no shrub or tree vegetation on it, which is why the one beaver dam is made of grass. The lack of beaver dams in Wasson is likely due to poor quality habitat for beavers (less desirable food and dam-making material).
- Birds
  - Some interesting things to consider during discussion:
    - Reed canary grass dies off each winter, which can reduce amount of 3-dimensional habitat available for birds;
    - In winter, auditory detections of birds were from calls, but by mid-March, songs were becoming more common (and potentially easier to detect).
    - Some birds migrate, which means you would only detect them at certain times of the year.

### Supplemental Activities

1. [Quadrat sampling](#)
2. Take a field trip to a local wetland ecosystem and collect some data of your own.
3. [FWS Lamprey Lessons](#)
4. [Oregon Tribal History: 4th Grade Level Math Lesson - Catching Lamprey](#)
5. Wetlands ecology curriculum with Confederated Tribes of the Siletz information: <https://appliedeco.org/wp-content/uploads/Siletz-Wetlands-Book.pdf>

### Summative Assessment

After completing the field journal, students will demonstrate their understanding of the NGSS standard HS-LS4-6 by answering essential questions that use the data and information they collected throughout their virtual wetlands visit and their own research. Students will make a claim supported by reasoning about how the Wasson Creek and Anderson Creek wetlands were impacted by human interactions by comparing them with the undisturbed Toms Creek ecosystem. Students will then share their claims and reasoning with another student and evaluate their partner's claim.