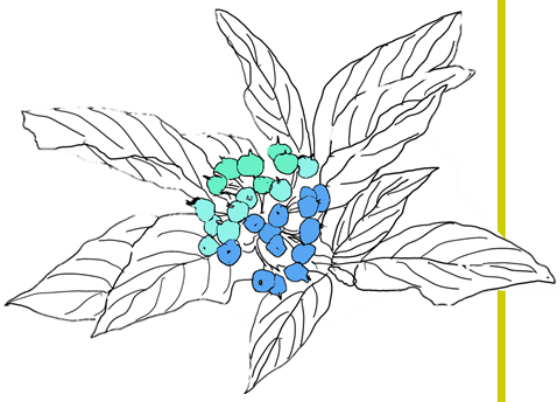
Welcome to the TWRS Phenology Walk along Pioneer Creek!

What is the phenology walk?

This walk, in partnership with the National Phenology Network (NPN), is designed to be a long-term monitoring project focused on the phenology of 15 individual plants. *Phenology* is the study of the timing of an organism's life events—for example, the date that the serviceberries first bloom or the elderberries become ripe. These dates from one year alone are interesting but don't tell a story. The bigger picture unfolds when you look for changes in the bloom date over many years. The NPN has sites all over the U.S. but very few exist in a designated wilderness area, making TWRS uniquely situated as a window into the lives of plants that exist with limited human influence.



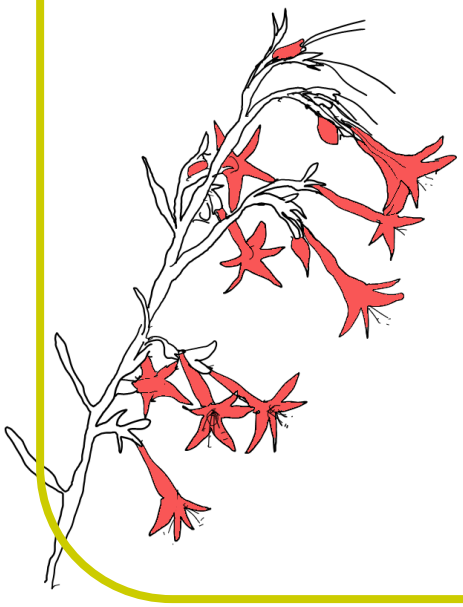
How do I participate in data collection?

Step 1. Grab a pair of binoculars and the small iPad.

Step 2. On the iPad, open the app called "Nature's Notebook".

Step 3. The screen should open to the "SITES" tab. Select "Pioneer Creek" and hit "Go to Plants & Animals". It will show you the list of plants. Each monitored plant has a wooden sign next to it on the trail, but use the map to help you find them initially.

Step 4. Select the tab on the top that says "Observe", then walk to start of the trail by the outhouses. The first plant is a Douglas fir. If you're not sure *which* Douglas fir, look at the photo of it on the "Plants & Animals" tab. Go down the list of list of questions and be sure to answer each one, even if the answer is "?". Please click the ⓘ to learn more about what the NPN means by each question. If you would like to see example photos for each phenophase, there is a document saved on the tablet (and in the twrs.research@gmail.com Google drive).

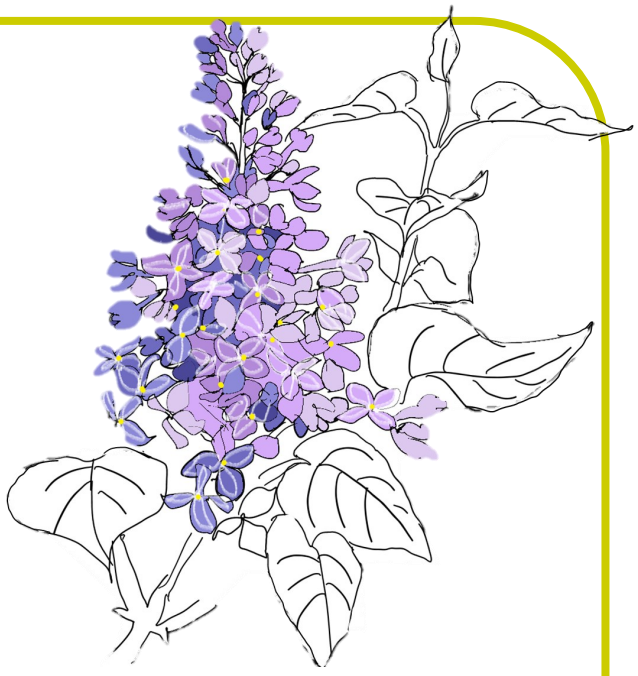


Step 6. When you've finished answering each question for the Douglas fir, click "Save Data" at the bottom and then "Next Plant". The data sheets should follow the plants in order as you walk the trail. Once you've recorded data for each plant (it takes around 45 minutes), take a drink out of Pioneer Creek! You earned it!

Step 7. Go to the "Site-Visit Details" page and enter the time you spent observing and how many were in your party. Hit "Save Data".

Step 8. If you go to the "Review" tab, there should be a check mark on the date. If it is grey, that means you might have skipped a question. You can scan the list for which species is missing data.

Monitoring Schedule

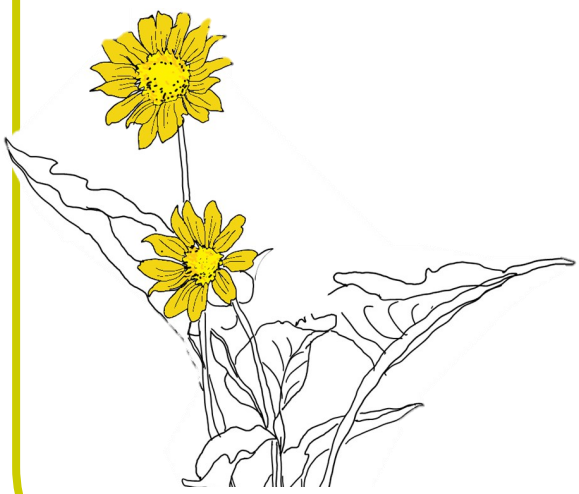


Ideally, the route is walked every 3-4 days, particularly in the spring and summer months. The NPN's "Nature's Notebook" site has a bouquet of resources to foster confident data taking and has tutorials for how to visualize data. Because Nature's Notebook it is a citizen science program, it is designed for folks with a wide range of science and botany backgrounds.

Ideas for Future Improvements

There is a document on the twrs.research drive named "Phenology Walk Plants of Pioneer Creek–Notes" that contains information on the individual plants being monitored. It would be excellent to create a folder for each monitored individual containing photos of it through the season exhibiting the different stages of growth! The walk was kept short and the number of plants limited in the hope it would not become a burden to collect data. If, in the future, there are more eyes on the ground looking for monitoring tasks, the other routes (Sage Flat and Airstrip) could be revived. The original documents detailing the locations of those plants is in the large binder in the library labeled "National Phenology Network" (or something like that). I also entertained the idea of doing a landscape-scale phenological monitoring by setting up a day-by-day timelapse of different landscape views (i.e. benches and black cliffs, airstrip, garden). It would be fun to partner with MOSS or local school and have them pick some overlapping species, so that you might exchange notes (postcards?!?!) about phenological differences between the two locations! The best thing for this walk, however, is just to do it! Bring a cup of coffee!

Other Phenological Data



As of this summer, there is a daily species checklist up in the cook house. We recorded presence/absence data for a birds, mammals, and herps. An "E" in the box denotes that that animal was seen at elevation (over 5000'). I had hoped to add a butterfly section but ran out of time (evacuated), so have left a list of suggested species and my vague recollection of when they appeared and disappeared on the google drive. There will also be a spreadsheet to enter the data from the hard-copy checklist. Maybe someone will use it in the future! For now, it's just a nice way to see things coming and going.

Please don't hesitate to email questions to bridgetlouisebradshaw@gmail.com or see the FAQ sheet in the google drive!