

FAUNTLEROY PARK IMPACT STUDY

Summit Atlas, Seattle / Fall 2023 / Ayla Wilk, science teacher

Science teacher Ayla Wilk at this charter school asked her two senior classes to study the impacts of urban development on nearby Fauntleroy Park. This report summarizes the methodology, findings, and recommendations of multiple teams that analyzed soil and water, assessed biodiversity, and recorded invasive plant species.

ABOUT FAUNTLEROY PARK

Surrounding a creek ravine, Fauntleroy Park encompasses 32.9 acres of cedar and Douglas fir forest and lowland alder wetlands. With many species of native plants and birds, plus habitat for juvenile coho salmon, it is an example of an ecosystem within a well-established Seattle neighborhoods. Like other small urban parks, its many trails invite local residents to walk their dogs, watch birds, and observe vegetation without traveling far.

ABOUT THIS STUDY

Seattle Parks and Recreation, as well as the volunteer Fauntleroy Watershed Council, aim to help the park's ecosystem be as strong and resilient as it can be. To evaluate the effects of urban development, we made two trips to the park to collect test samples and make observations. We went into this study unsure of what the results would be. Although each team attempted to follow the same methodology, we acknowledge a degree of inconsistency common in student studies.

SOIL ANALYSIS

Each team used a scoopula and test tubes to collect soil samples from two locations (see map). Back in the classroom, we added water to the test tubes and used LaMotte TesTabs to get the following results:

- Nitrate: 0 to 3.0 ppm at both locations (healthy is 30.0 ppm).
- Phosphate: near zero ppm at both locations (healthy is 37.5 ppm).
- pH (wide range): 5.0 to 7.5 (healthy is 7.0)

Microscopic examination revealed no bugs or other discernible life.

Conclusions, Limitations, and Recommendations

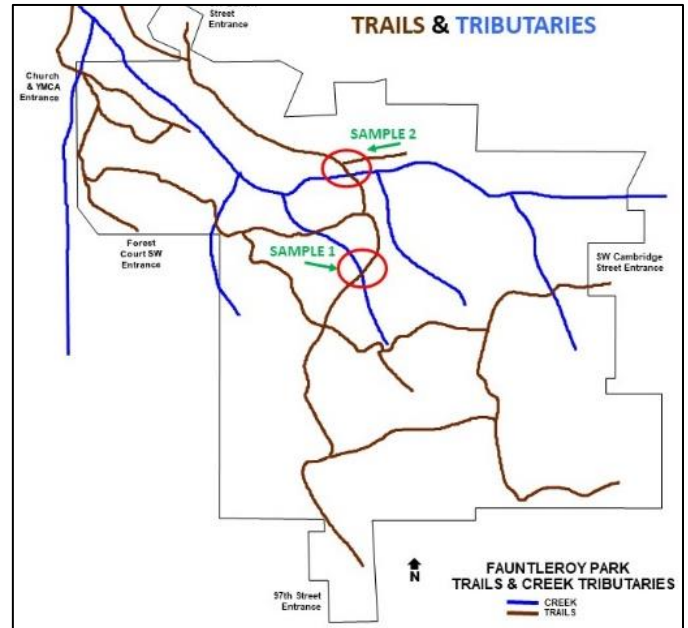
- Nitrate and phosphate levels could indicate that urban development is negatively affecting soil quality.
- Acidity from decomposing evergreen needles in sample locations could be affecting soil chemistry.
- Human activity could have affected samples taken near the trail.
- Do more concise analysis in multiple locations to confirm these conclusions.

BIODIVERSITY

Teams used the line-transect sampling method to observe plant species within an arm's reach on both sides of a 3-meter length of string at two trail junctions in the middle of the park. Each team then took photos and used the Seek app to identify up to 128 individuals representing 18 species, including Western sword fern, Oregon grape, salmonberry, snowberry, Indian plum, and big-leaf maple. A Shannon-Wiener Index reading of 0.798 to 2.62 indicated that biodiversity was normal to low (ideal is between 1.5 and 3.5) but still healthy. (The range can be from 0 for a community with a single species to over 7 for an extremely diverse community.) We also looked for animal biodiversity and noted the presence of squirrels, worms, and birds.

Conclusions, Limitations, and Recommendations

- The variety and number of species indicated good ecosystem health and no risk of plant extinction.
- Repeat this analysis at multiple locations and during wet and dry seasons for a fuller picture.
- Continue to take out invasive species and restore native plants to improve biodiversity.
- Encourage park users to stay on established trails to protect plants.



INVASIVE PLANT SPECIES

We again used the line-transect sampling method and the Seek app to assess invasive plant species in the park. We then referred to “Invasive Species” published by the Washington Department of Fish & Wildlife to determine which species we found were considered invasive.

Conclusions, Limitations, and Recommendations

- Some teams found none; others observed Scotch broom, garlic mustard, English ivy, knotweed, and tansy ragwort.
- The state list may not have contained all invasive species common to western Washington.
- Findings were limited by sample size and location.
- Encourage park users to do their part to keep it healthy.

WATER QUALITY

Water quality can be affected by urban development in multiple ways, including animal waste and garbage. To check water chemistry in the park, each team collected water samples at two locations and used Verify test strips for “complete” testing (16 parameters) back in the classroom. For some teams, almost half the indicators were okay and the rest were low. The ranges of specific readings were similar at both locations, with the following proving to be the most interesting::

- pH 6 to 7 (slightly acidic-neutral)
- hardness 75 to 100 mg/L (moderate)
- sulfate 200 to 400 mg/L (slightly over the limit, possibly from natural deposits or fertilizers)

Conclusions, Limitations, and Recommendations

Water quality appeared to be healthy overall for animals living in the park but it can be impaired by pollution in runoff. Test strips may not always result in correct readings, however, because of their age or their exposure to moisture. Also, all our teams took samples from the same locations instead of testing throughout the park.

CONCLUSIONS

Our examination of Fautleroy Park unveiled the richness and complexity of its natural ecosystem. By observing wildlife from a respectful distance, we gained valuable insights into the coexistence of native species and the lush vegetation that thrives in the park. The project enhanced our appreciation for the park's biodiversity and underscored the importance of what we concluded is a generally healthy ecosystem.

SOURCES

“Invasive Species.” Washington Department of Fish & Wildlife (wdfw.wa.gov/get-involved/educational-resources/invasive-species).

A.J. Kerkhoff. “Measuring Biodiversity in Ecological Communities.” Kenyon University, 2010.

“Student Handout 1A: How to Calculate Biodiversity.” (entnemdept.ufl.edu/hodges/protectus/K-12_Lesson_Plans.html).

“Species Diversity Lab.” (brittonsrhs.weebly.com/uploads/5/1/9/1/51914181/biodiversity_lab.pdf).

Water & Soil Quality Reference Sheet (drive.google.com/file/d/1LUUFCExyI2aVTwU-l8AkD6jF5WcHuh-U/view).

Wells, Edward. “Watershed Assessment Teacher Lab Template” College Entrance Examination Board, 2023 (apcentral.collegeboard.com).

“Fautleroy Park Vegetation Management Plan.” (fautleroywatershed.org/wp-content/uploads/2021/10/draft_vegetation_management_plan.pdfapps.ecology.wa.gov/publications/documents/0710037.pdf)

“Fautleroy Park Tree Walk.” (fautleroywatershed.org/index.php/park/treewalk/).