

ECOLOGICAL RESEARCH TO INFORM STREAM MANAGEMENT AFTER WILDFIRES LARIMER COUNTY

PROJECT INTRODUCTION



Beavers are a keystone species that have significant impacts on the ecosystems they inhabit⁽¹⁾. The presence of beaver dams has been shown to increase an area's resilience to wildfires by reducing water flow rates and increasing groundwater absorption⁽²⁾. Translocating beavers is an increasingly important part of wildlife management, especially in Western states; they need to be removed from areas where they may be causing damage and translocated to areas where they can help bolster and protect the ecosystem. In doing this, we need to be aware of the diseases the beavers could carry with them; some may infect other beavers in the area, while others can simply be transported on the fur of beavers and have harmful impacts on the fish and amphibian populations that inhabit the streams that the beavers are being translocated to⁽³⁾. This begs many questions, such as: which diseases can cause significant impacts upon translocation? How should we test and treat captured beavers for these diseases? How long should our quarantine periods be? What potentially zoonotic diseases should be considered?

INTERNSHIP GOALS

- 1) Develop a report on diseases transmitted by beavers for Colorado Parks & Wildlife to assist in the creation of a statewide beaver management plan
- 2) Assist in ecological field research studying stream health and resilience to wildfire

HOW DOES THIS APPLY TO YOUR EDUCATION

As a veterinary student with an interest in wildlife disease research, this was a highly valuable experience. I was able to obtain field research experience, network with wildlife veterinarians at Colorado Parks & Wildlife, the National Wildlife Research Center, and the Western Association of Fish and Wildlife Agencies, as well as learn more about infectious diseases affecting mammals, amphibians, and fish in stream ecosystems of Colorado.

WHAT YOU DID

Worked with Colorado Parks & Wildlife to develop a survey sent to other state wildlife management entities for the purpose of elucidating other states' beaver management protocols

Developed a short literature review on the diseases relevant to beaver translocation to better guide CPW's work on a statewide beaver management plan

Assisted in field work for studies investigating the impact of beaver dams and human-made beaver dam analogs on the ability of streams to recover after wildfire events



Image 1.



Image 1. Photo of an emergence trap for invertebrate collection in a confined stream

WHAT YOU LEARNED

- Ecological field research skills such as aquatic macroinvertebrate sampling techniques, stream habitat variable measurement, and the use of electroshockers for fish surveys
- Infectious diseases of importance in mammals, amphibians, and fish relevant to beaver translocation such as tularemia, chytridiomycosis, and whirling disease
- Networking with wildlife management entities, wildlife veterinarians, and other researchers in the field of wildlife disease

Image 2.



Image 2. Use of electroshockers for fish surveys

NEXT STEPS

- Analyze data obtained from field work to better inform stream management strategies after wildfires
- Continue working with Colorado Parks & Wildlife on the production of a statewide beaver management plan

REFERENCES

1. Janiszewski, P. A. W. E. U., Hanzal, V., & Misiukiewicz, W. (2014). The Eurasian beaver (*Castor fiber*) as a keystone species—a literature review. *Baltic forestry*, 20(2), 277-286.
2. Fairfax, E., and A. Whittle. 2020. Smokey the Beaver: beaver-dammed riparian corridors stay green during wildfire throughout the western USA. *Ecological Applications* 30(8):e02225. [10.1002/eap.2225](https://doi.org/10.1002/eap.2225)
3. Girling, S.J., Naylor, A., Fraser, M. and Campbell-Palmer, R. (2019), Reintroducing beavers *Castor fiber* to Britain: a disease risk analysis. *Mam Rev*, 49: 300-323. <https://doi.org/10.1111/mam.12163>