

Benjamin Dittbrenner

Executive Director at Beavers Northwest PhD_Student, Sch.Environmental and Forestry Sciences,
U of Washington

dittbrenner@gmail.com

Summary

My Research Interests Current climate models predict that the Pacific Northwest will experience considerable hydrologic alterations over the next century. Summer precipitation and stream flow will likely decrease, as will snowpack; snow melt is projected to occur earlier in the year, and winter precipitation, storm intensity, and stream temperatures will likely increase. These changes may threaten sensitive habitats and species as well as ecosystem resilience. ESA-listed fish and wildlife, such as salmon and steelhead, will undoubtedly suffer additional declines in their already limited habitat if these projections are realized. The types of impoundments that beavers (*Castor canadensis*) create may be able to offset some of the anticipated hydrologic and temperature changes. Beaver impoundments have been shown to attenuate peak flows, recharge groundwater and hyporheic flows, and regulate stream temperature and base flow. Little research, however, has been done to quantify these benefits. I am assessing how beaver dam networks modify measures of stream water quantity, such as residence time, base flow, and hyporheic lateral flow as well as stream temperature. My research explores how effective beaver reintroductions and beaver impoundments can be at mitigating hydrologic alteration due to climate change. The products of this research will be used to inform restoration policy and planning efforts in headwater riparian systems.

Education

University of Washington

Doctor of Philosophy (Ph.D.), Forest Ecology, 2013 - 2017

State University of New York at Albany

M.S., Biodiversity, Conservation, & Policy, 2002 - 2004

Activities and Societies: Albany Student Press

University of Wisconsin-Milwaukee

B.S., Biological Sciences, 1996 - 2001

University of Wisconsin-Milwaukee

B.S., Environmental Sciences & Conservation, 1996 - 2001

Experience

Ph.D Student at School of Environmental and Forestry Sciences, University of Washington

July 2013 - Present (1 year 9 months)

Teaching Experience GIS Instructor (TA), January 2014 - June 2014 Instructed GIS 250/520 section.

Duties included instruction, curriculum setting , lesson planning, and grading. Capstone Advisor, January

2014 - present. Direct internship activities and senior research of ESRM students. Moreover, I assist each student in developing an independent scholarly project that dovetails with their hands-on work.

Ecologist at Surface Water Management, Snohomish County

January 2009 - July 2013 (4 years 7 months)

Beaver Management Program Managed County's non-lethal beaver program and provide regional expertise in non-lethal beaver management to other jurisdictions and agencies. Install and maintain flow control and beaver exclusion devices, supervise programmatic beaver device permitting, and provide technical assistance to private landowners. Work with landowners and public to raise awareness on benefits of beaver dams and reduce conflict. Land Cover Classification and Change Detection Project Collaborated on County land-cover and wetland maps biannually using a model based on remotely sensed and other data across 369,000 acre study area. Develop change detection model using change-vector analysis. Biannual mapping was used to determine types of critical area impacts occurring and the drivers for these impacts. Intensive Catchment Study: Functions and Values Assessment of Critical Areas Assessed impacts of development on ecological function of headwater watersheds. The study evaluated the effectiveness of various sized riparian buffers in improving watershed health utilizing a suite of biotic and abiotic indicators. Snohomish County Shoreline Inventory and Monitoring Project Ongoing inventory of shoreline conditions on 288 km of river shorelines and 45 km of lake shorelines to document the extent and type of shoreline modifications, instability, and other measures of disturbance. Surface Water Management Regulatory Program Established and managed SWM's regulatory program for aquatic lands restoration, participate in regulatory policy direction-setting, authorized and certified project compliance for County environmental regulations, and acted as SWM's Authorized Agent when coordinating with outside agencies.

Biologist at Environmental Services & PDS, Snohomish County

April 2006 - January 2009 (2 years 10 months)

Authored Critical Area Studies, mitigation and monitoring reports. Conducted site reviews. Provided best available science and permit expertise to County departments. Met with public on project sites, and was staff representative on technical advisory committees and interest groups. Performed wetland delineation, rating, and categorization. Conducted stream typing, OHWM delineation, and critical species review.

Ecologist at US Dept of Defense (with Anteon Corp)

2004 - 2006 (2 years)

Managed Camp Pendleton's (CPEN) riparian mapping and ecological community change detection program. Designed and conducted rare plant and endangered species and habitat monitoring programs. Authored land management chapters of CPEN's Integrated Natural Resources Management Plan. Participated in designing CPEN's Long Term Ecological Trend Monitoring program. Designed and coordinated riparian and wetland delineation, mitigation, and restoration. Provide ecological expertise in planning, writing and review of Environmental Assessments (EA) and Environmental Impact Statements (EIS).

Research Assistant at University at Albany

2002 - 2004 (2 years)

Analyzed the relationship between canopy and sub-canopy structure in forested wetland communities to identify properties that could be utilized for remote classification and monitoring of forested wetlands. Results showed that forested wetlands with increasing levels of human-induced disturbance were more difficult to identify remotely, making suburban isolated wetlands the most vulnerable as well as most challenging to monitor. Assisted in planning, coordinating, and executing wetland remote sensing project. Led site selection program and conducted outreach to private landowners. Collected physical, vegetation, habitat, and hydrogeomorphic wetland data. Compiled GIS database, managed data, and performed statistical analysis and QA/QC.

Volunteer Coordinator at Urban Ecology Center

2000 - 2002 (2 years)

Independent Undergraduate Researcher at Savannah River Ecology Laboratory

2000 - 2000 (less than a year)

Awarded NSF fellowship to conduct research at the SREL in phytoremediation and biogeochemical applications on pyrite and acid mine drainage. Designed, planned and executed a pyrite toxicity amelioration experiment using a suite of biotic, abiotic, and chemical treatments.

Honors and Awards

Grant: Beaver relocation in the Skykomish Watershed

USGS Student Interns in Support of Native American Relations (SISNAR) Program

August 2014

Awarded funding to employ two USGS interns to participate in monitoring and relocation field work.

Grant: Use of unmanned aerial vehicles to measure how beaver reintroductions mitigate effects of climate change

Northwest Science Association, Student Research Grant Competition

April 2014

Grant: Using Beaver to Restore Ecosystem Functions in the Skykomish Watershed

Ecotrust, Whole Watershed Restoration Initiative

March 2014

<http://www.ecotrust.org/wwri/>

Grant: Evaluating the use of beaver relocation as an ecosystem tool in headwater streams of the Snohomish River Basin

Northwest Indian Fisheries Commission

January 2014

Grant: Using Beaver as an Ecosystem Service Provider on Forestlands in the Snohomish River Basin

Northwest Indian Fisheries Commission

July 2013

Publications

Successful Beaver Management Techniques

Jefferson County Conservation District Meeting October 2014

Authors: Benjamin Dittbrenner

Skykomish Beaver Project

Snohomish River Basin Salmon Recovery technical Committee Meeting October 2014

Authors: Benjamin Dittbrenner

PNW beavers are a lot like you, a little different

SEFS Water Seminar March 2014

Authors: Benjamin Dittbrenner

Successful Beaver Management Techniques

Regional Fisheries Enhancement Group 2013 Retreat, Cle Elum, WA November 2013

Authors: Benjamin Dittbrenner

Wetland mapping in Snohomish County

Association of American Geographers 2011 Annual Meeting, Seattle, WA 2011

Authors: Gi-Choul Ahn, Andre Coleman, Jerry Tagestad, Andy Haas, Mike Rustay, Benjamin Dittbrenner, Hahn Chul Jung, Darla Boyer

Community composition variation in Forested Wetlands: Ground-based and Hyperspectral Remote Sensing Techniques

Master of Science Thesis Defense, University at Albany July 2004

Authors: Benjamin Dittbrenner

Remote Sensing and Ground-based Approaches for Describing Forested Wetlands

Northeast Natural History Conference, 8th annual meeting, Albany, NY. May 2004

Authors: Benjamin Dittbrenner, G.S. Kleppel

Disturbance and the Invasion of Lythrum Salicaria (Purple Loosestrife)

Society of Wetland Scientists, 25th annual meeting, Seattle, WA. 2004

Authors: A.H Hartwell, Benjamin Dittbrenner, R.R. Shirer, G.S. Kleppel

Remote Classification and Hyperspectral Assessment of Wetland Ecosystems

University at Albany, GIS Symposium, Albany NY November 2003

Authors: Benjamin Dittbrenner, A.L Hartwell, R.R. Shirer, G.S. Kleppel

High Resolution, Hyperspectral Assessment of Wetland Ecosystems: Classification from a Remote Platform

Ecological Society of America, 88th Annual meeting, Savannah GA July 2003

Authors: Benjamin Dittbrenner, A.L Hartwell, R.R. Shirer, G.S. Kleppel

High Resolution Remote Sensing: Testing a Monitoring and Assessment Tool For Wetlands

Society of Wetland Scientists, 24th annual meeting, New Orleans, LA. June 2003

Authors: Benjamin Dittbrenner, A.L Hartwell, R.R. Shirer, G.S. Kleppel

Evaluating techniques for reducing acid production in reject coal spoil.

Formal Presentation, Savannah River Ecology Laboratory, Aiken, SC. September 2000

Authors: Benjamin Dittbrenner, T. Punshon, D. Adriano

Projects

Skykomish Beaver Project

July 2013 to Present

Members: Benjamin Dittbrenner, Jason Schilling, Chris Tran, Molly Alves, Chris DiTomaso

Organizations

Beavers Northwest

Executive Director

December 2014 to Present

www.BeaversNW.org

Northwest Scientific Association

February 2014 to Present

Snohomish Beaver Working Group

Skills & Expertise

Ecology

Aquatic Ecology

Wetland Science

Wetlands

Higher Education

Beaver Management

Ecological Restoration

Remote Sensing

Statistics

Spatial Analysis

ArcGIS

Endangered Species

Climate Change

Environmental Awareness

Science

GIS

Research

Environmental Science

Natural Resource Management

Languages

English

(Native or bilingual proficiency)

Spanish

(Limited working proficiency)

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[Contact Benjamin on LinkedIn](#)