Braden Burkholder

Montana Natural Heritage Program
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EDUCATION

2012 Master of Science in **Fish and Wildlife Management**, Montana State University, Bozeman, MT
2004 Bachelor of Arts in **Biology**, Whitman College, Walla Walla, WA
2000 Helena High School, Helena, MT

EXPERIENCE

Biologist/Biological Data Analyst **Oct 2014-Present**
Montana Natural Heritage Program Helena, MT

Established and maintained multiple geospatial databases in SQL Server to efficiently store and analyze millions of records. Developed tools for streamlined data processing and analysis and became proficient in Python coding and integration with ArcGIS and SQL Server. Created statewide predicted suitable habitat models for animal and plant species of concern using advanced machine learning techniques and automated the process in Python to produce these models and reports. Designed forms in Survey123 and maps in Collector for ArcGIS to enable mobile data collection by agency personnel and the public. Created tools to improve workflows of NHP Staff, including automation of day-to-day and miscellaneous tasks with custom programming/scripts. Assisted with project work as needed, including custom data products for partner organizations, database design and development, and statewide bat acoustic monitoring data management, analysis, and automated report production in Python. Analyzed large bat acoustic datasets on a remotely accessed Linux OS supercomputer. Presented at trainings, workshops, and conferences. Maintained and managed geospatial databases of animal, plant, and biological community information for the entire state of Montana. Assisted with acquisition and integration of information on priority plant and animal species and large data exchanges with partner organizations. Responsible for reviewing, validating, and interpreting data independently. Maintained databases of images, literature references, and data sources. Fulfilled information requests made by partner agencies, private companies and the general public.

Biologist/Information Specialist **June 2013-Sept 2014**
Montana Natural Heritage Program Helena, MT

Maintained and managed geospatial databases of animal, plant, and biological community information for the entire state of Montana. Developed a working knowledge of Heritage data standards and methodologies. Assisted with acquisition and integration of information on priority plant and animal species and large data exchanges with partner organizations. Responsible for reviewing, validating, and interpreting data independently. Updated species distribution maps in the MTNHP data system and website resources. Maintained databases of images, literature references, and data sources. Fulfilled information requests made by partner agencies, private companies and the general public. Worked closely with biologists and data managers from state, federal, and non-governmental partners to assemble, integrate, and disseminate information from a variety of statewide databases. Expanded skills in MS Access and ArcGIS and gained experience with SSMS and Python to improve ecological knowledge of Montana's native species.

EXPERIENCE (continued)

Wildlife Conservation Technician **June 2007-May 2013**
Montana Fish, Wildlife and Parks Bozeman, MT

Assisted local wildlife biologists with wildlife management responsibilities, including aerial big game surveys, hunter check station data collection, small mammal surveys, riparian and vegetation surveys, and monitoring a transplanted bighorn sheep population. Established, improved, and maintained various survey and harvest databases. Analyzed data and reported findings in the form of written reports and oral recommendations that broadened local knowledge of wildlife population dynamics and improved wildlife habitat through adaptive management. Recommended management actions and strategies based on the results of concurrent Master's research. Assisted with the writing of Environmental Assessment documents for local department actions and drafted administrative plans for two Wildlife Management Areas as a principal author. Used ArcGIS to produce numerous documents and maps for public and internal use. Examined and repaired spatial data from various harvest records in GIS. Interacted with and educated the public in the office/field and at various public meetings, including the effective explanation of department positions and policies. Worked with various landowners (traditional and non-traditional) to complete objectives for the benefit of local wildlife populations. Trained and managed volunteers on various field and office projects.

Research Technician **July 2006-Sept 2006**
Colorado Division of Wildlife/Colorado St. University Taylor Park, CO

Assisted with Ph.D. dissertation research on snowshoe hare ecology in central Colorado, examining hare density and habitat use in forest stands with different tree harvest treatments.

Wildlife Technician **May 2006-June 2006**
Colorado Division of Wildlife Telluride, CO

Worked on a field crew monitoring a reintroduced population of Canada lynx for management and population research throughout SW Colorado.

Research Assistant (volunteer) **Feb 2006-Apr 2006**
Maine Department of Inland Fisheries and Wildlife Clayton Lake, ME

Worked on a field crew conducting long-term research on population demographic and habitat selection of Canada lynx in northern Maine.

Research Technician **Dec 2005-Jan 2006**
South Dakota State University Lead, SD

Assisted with Master's thesis research on the distribution and habitat use of the recently reintroduced American pine marten in the Black Hills of South Dakota.

Research Technician **Sept 2005-Dec 2005**
South Dakota State University Wind Cave National Park, SD

Assisted with Ph.D. dissertation research examining mule and white-tailed deer behavior and ecology in relation to possible means of Chronic Wasting Disease (CWD) transmission.

Field Intern (volunteer) **Nov 2004-May 2005**
Ventana Wildlife Society Big Sur, CA

Worked on the California Condor Recovery Program to reintroduce and manage wild, free-flying condors.

EXPERIENCE (continued)

Research Assistant (volunteer) **Oct 2004**
University of California, Davis Santa Cruz Island, CA
Assisted with Ph.D. dissertation research on endangered island fox ecology to examine factors influencing individual survival and fecundity. Hired to consult on the development of radio telemetry field protocols.

Research Assistant (volunteer) **July 2004-Sept 2004**
University of California, Davis Santa Cruz Island, CA
Assisted with Master's thesis research in island spotted skunk ecology to determine home range, habitat selection, diet, social structure, and interspecific relationships with island foxes.

Research Technician/NSF REU Intern **June 2003-Aug 2003**
Oregon State University H. J. Andrews Experimental Forest, OR
Assisted with Master's thesis research on the composition of macroinvertebrate communities in headwater streams. Completed an independent research project for an undergraduate thesis.

SOFTWARE PROFICIENCIES

- ArcGIS suite (Desktop 10.x & Pro 2.x), including Survey123, Collector for ArcGIS, ArcGIS Online (Mapping applications, StoryMaps, cross-platform compatibility), and geodatabase management
- SQL Server database management with SSMS (2017), SQL queries
- Python coding (2.x & 3.x) and integration with databases and GIS
- Microsoft Office software, including PowerPoint, Access, and OneNote
- SonoBat (4.x) and Kaleidoscope (4.x) software for bat call analysis
- MaxEnt (3.x) for creating predicted suitable habitat models

PUBLICATIONS AND REPORTS

Bachen, D., A. McEwan, B. Burkholder, S. Hilty, S. Blum, and B. Maxell. 2018. Bats of Montana: Identification and Natural History. Report to Montana Department of Environmental Quality. Montana Natural Heritage Program. Helena, MT. 111pp.

Reichert, B., C. Lausen, S. Loeb, T. Weller, R. Allen, E. Britzke, T. Hohoff, J. Siemers, B. Burkholder, C. Herzog, and M. Verant. 2018. A guide to processing bat acoustic data for the North American Bat Monitoring Program (NABat). U.S. Geological Survey Open-File Report 2018–1068, 33 p. U.S. Geological Survey, Reston, VA.

Bachen, D., A. McEwan, B. Burkholder, S. Blum, and B. Maxell. 2018. Long-term acoustic assessment of bats at coal mines across southcentral Montana and management recommendations for bats. Report for MT Department of Environmental Quality. Air, Energy, and Mining Division. Coal Section. Montana Natural Heritage Program.169 p. plus appendices.

Bachen, D., A. McEwan, and B. Burkholder. 2018. Evaluation of Indicators of Environmental Sensitivity with Respect to Bats and their Native Habitats near Albeni Falls Dam and Lake Pend Oreille, Idaho. Montana Natural Heritage Program, Helena, Montana. 18 p. plus appendices.

Burkholder, B., N. DeCesare, R. Garrott, and S. Boccadori. 2017. Heterogeneity and power to detect trends in moose browse utilization of willow communities. Alces 53: 23-39.

PUBLICATIONS AND REPORTS (continued)

Maxell, B., B. Burkholder, S. Hilty and S. Blum. 2016. Long-term acoustic assessment of bats on Big Sheep Creek in the Tendoy Mountains of southwest Montana and management recommendations for bats. Prepared for Beaverhead-Deerlodge National Forest and Dillon Field Office of the Bureau of Land Management. Montana Natural Heritage Program. Helena, MT. 49 p. plus appendices.

Maxell, B., S. Hilty, B. Burkholder, and S. Blum. 2016. Long-term acoustic assessment of bats at Maiden Rock on the lower Big Hole River in the Pioneer Mountains of southwestern Montana and management recommendations for bats. Report to Beaverhead-Deerlodge National Forest and Dillon Field Office of the Bureau of Land Management. Montana Natural Heritage Program, Helena, Montana. 57 p. plus appendices.

Maxell, B., B. Burkholder, S. Hilty and S. Blum. 2015. Acoustic assessment of bats near the Landusky Wind Turbine site in the Little Rocky Mountains of north central Montana and management recommendations for bats. Montana Natural Heritage Program. Helena, MT. 66 p. plus appendices.

Burkholder, B. 2012. Seasonal Distribution, Winter Habitat Selection, and Willow Utilization Patterns of the Shiras Moose on the Mount Haggin Wildlife Management Area. 262 p. Master's Thesis. Montana State University, Bozeman, MT.

Burkholder, B. 2004. The Influence of Discharge and Temperature Variation on Macroinvertebrate Community Diversity Patterns in Headwater Streams. 30 p. Undergraduate Thesis. Whitman College, Walla Walla, WA.

WORKSHOPS

Burkholder, B. and D. Bachen. *Digital Tools for Recording Species Observation and Survey Data.* Co-instructor. 57th Ann. MT Chap. of the Wildlife Society Conference, Feb 27, 2019.

Maxell, B., J. Szewczak, B. Burkholder, S. Hilty, and S. Blum. *Methods for Acoustic Surveillance and Bat Capture in Montana.* Assistant instructor. Beartooth WMA, Jun 15-17, 2015.

Maxell, B., B. Burkholder, S. Hilty, and S. Blum. *Montana Bat and White-Nose Syndrome Surveillance Efforts: with an Emphasis on Recording and Analyzing of Bat Echolocation Calls.* Co-instructor. 53rd Ann. MT Chap. of the Wildlife Society Conference, Feb 24, 2015.

PRESENTATIONS

Bachen, D., B. Burkholder, H. Harris, M. McGrath, and B. Skone. *Establishing Range for Montana's Rarest Bat Species: The Northern Myotis.* 57th Ann. MT Chap. of the Wildlife Society Conference, Feb 2019.

Burkholder, B. and B. Maxell. *Citizen Scientist Observation Data in Montana.* NatureServe's Biodiversity Without Boundaries Conference, Apr 2017.

Burkholder, B. and B. Maxell. *Predicted Suitable Habitat Modeling for Species of Concern in Montana.* 55th Ann. MT Chap. of the Wildlife Society Conference, Feb 2017.

Bachen, D., B. Burkholder, A. McEwan, and B. Maxell. *Acoustic Assessment of Year-round Bat Activity and Distribution in Montana and Surrounding Areas* (Poster). 55th Ann. MT Chap. of the Wildlife Society Conference, Feb 2017.

PRESENTATIONS (continued)

Burkholder, B. *Downloading Weather Station Data Using the MesoWest Application Programming Interface*. 2016 Intermountain GIS Conference, Apr 2016.

Hilty, S., B. Burkholder, B. Maxell, S. Blum, L. Hanauska-Brown, A. Shovlain, and J. Chaffin. *Montana's Bat Acoustic Surveillance Efforts: An Update*. 54th Ann. MT Chap. of the Wildlife Society Conference, Feb 2016.

Maxell, B., B. Burkholder, S. Hilty, S. Blum, L. Hanauska-Brown, A. Shovlain, and J. Chaffin. *Montana's Bat Acoustic Surveillance Efforts.* North American Joint Bat Working Group Meeting, St. Louis, MO, Mar 2015.

Burkholder, B., B. Maxell, S. Hilty, S. Blum, L. Hanauska-Brown, A. Shovlain, and J. Chaffin. *Montana's Bat Acoustic Surveillance Efforts: Pre-White-Nose Syndrome* (Oral Presentation and Poster). 53rd Ann. MT Chap. of the Wildlife Society Conference, Feb 2015.

Burkholder, B. *Ecology and Management of Moose in Montana*. Monthly meeting of the Sacajawea (Bozeman) Audubon Society, Oct 2012.

Burkholder, B., V. Boccadori, and R. Garrott. *Moose Management in Southwestern Montana: Insights from Four Years of Field Research*. 50th Ann. MT Chap. of the Wildlife Society Conference, Feb 2012.

Burkholder, B., V. Boccadori, and R. Garrott. *Winter Distribution, Habitat Use, and Willow Utilization Patterns of the Shiras Moose on the Mount Haggin WMA*. 49th Ann. Montana Chapter of the Wildlife Society Conference, Feb 2011.

Burkholder, B. and V. Boccadori. *Moose Research Update on the Mount Haggin WMA*. Monthly meeting of the Anaconda Sportsmen's Club, Apr 2010.

Burkholder, B. and V. Boccadori. *Moose Research Update on the Mount Haggin WMA*. Monthly meeting of the Skyline (Butte) Sportsman Association, Mar 2010.

Burkholder, B., V. Boccadori, and R. Garrott. *Winter Distribution, Habitat Use, and Willow Utilization Patterns of the Shiras Moose on the Mount Haggin WMA: Study Plan and Preliminary Data*. 47th Ann. Montana Chapter of the Wildlife Society Conference, Feb 2009.

Burkholder, B. *What are those crazy bugs up to? Unusual patterns in the diversities of stream macroinvertebrate communities in Oregon*. 6th Ann. Whitman Undergraduate Conference, Apr 2004.

FIELD SKILLS AND ABILITIES

- Topographic map reading, orienteering, GPS data collection, and backcountry navigation
- Multi-day backpacking surveys, on and off trail
- Ground and aerial telemetry of VHF collars/tags, especially in rugged terrain
- Safe and efficient snowmobile and ATV use on and off trail
- 4WD driving in foggy, muddy, snowy, and icy conditions
- Aviation safety certified (small planes and helicopters)
- Wilderness First Aid, CPR, and Leave No Trace land ethics

Updated: November 2019