

Proposal – Urban ecologist tenure-track position, Department of Zoology, WSU

Rationale:

Urban ecology is a well-established and growing sub-discipline of ecology. This specialization emerged and grew during the late 20th and early 21st Century. By 2010, the field had joined mainstream ecology (Mayer 2012, *Nature* 467: 153). Now, the Ecological Society of America (for instance) has established an Urban Ecosystem Ecology Section and The Wildlife Society has formed the Urban Working Wildlife Group. Two professional journals, *The Journal of Urban Ecology* (Oxford Academic Publishers) and *Urban Ecosystems* (Springer), are devoted entirely to this topic. Further, special sections on Urban Ecology occur in various journals such as *Frontiers in Ecology and Evolution* and *Frontiers in Sociology* (Frontiers Media). In addition, the National Science Foundation supports two urban Long-Term Ecological Research sites (Baltimore and Phoenix) and the University of Utah offers a BS and BA in Urban Ecology (<http://plan.cap.utah.edu/bachelor-of-science-bachelor-of-arts/>).

Weber State's location amid the rapidly expanding population of the Wasatch Front is a highly compatible setting for the teaching and research of an urban ecologist. According to the 2010 U.S. Census, Utah is the seventh most urbanized state, as measured by the total fraction of its population living in an urban setting. The Utah Foundation projects that Utah's current rapid growth will continue through mid-century, adding another 1.0–2.5 million people.

Urban environments like the Wasatch Front are associated with the fragmentation and decline of populations of native species, increased rates of human-wildlife conflict, and the physiological, behavioral and evolutionary changes associated with animals living in novel and highly altered habitats. Like other urban areas, pollution is also an issue and air pollution is a particularly important issue within the Salt Lake City Metropolitan area. Urban environments also include a growing number of human residents with an interest in nature. For these reasons, an urban ecologist makes sense in the context of Weber State's immediate physical setting.

Departmental Strategic Planning:

Hiring an Urban Ecologist would align with departmental strategic goals. Overall, faculty members are central to all of the department's strategic goals. Faculty are needed to teach courses at all levels; advise students; engage students in research; and provide service to the university, profession, and community. In particular, hire of an urban ecologist would diversify the Department and College by adding an academic specialty not currently present. In the Department, this would increase the breadth of upper-division elective courses offered to better serve and attract a range of students with broad interests. At the same time, the new hire would contribute to support courses for the major and for other departments and programs (e.g., Environmental Studies).

Hire of an urban ecologist would increase the range and number of research options for students. This would be particularly germane for the typical WSU student who may have limited means or time to engage in field research in a remote location. Studies in urban ecology could occur throughout the most accessible areas within the area drawing the majority of Weber State Students (Davis and Weber counties along the Wasatch Front), which could open up a relative wealth of high-impact learning possibilities.

Research conducted within the urban environment along the Wasatch Front could have relatively high visibility in the community and be of greater than normal interest among local schools and with the local media. There are relatively numerous opportunities to collaborate with local and state government agencies and organizations. Further, research in the urban environment may provide a novel way to recruit diverse students into the College of Science, including some who might not normally see themselves as typical scientists. That is, hands on research in people's own neighborhoods, focusing on things they care about, may ignite their scientific imagination. Science in the Parks is GREAT for the kids, but there are teens and adults from these neighborhoods who may find themselves interested in engaging in citizen science

Building a Collaborative Research Community:

Depending on the research focus of this hire, a variety of collaborations is possible on and off campus. For example, ecology is a multi-disciplinary science and naturally lends itself to collaborations among scientists with varying expertise. College of Science faculty with potentially complementary research interests in the COS include (in alphabetical order):

- (1) Brandon Burnett with a program of water monitoring,
- (2) John Cavitt with active research on Great Salt Lake shorebirds and pollutants,
- (3) Carie Frantz with an active research on the geochemistry of the Great Salt Lake and environmental biogeochemistry,
- (4) Bridget Hilbig with active research on fungal ecology of green roofs,
- (5) Michael Hernandez with active research using Geographical Information Systems,
- (6) Chris Hoagstrom with active research on fish ecology in Wasatch Front Streams,
- (7) Marek Matyjasik with interest in runoff and contaminant transport in soils and groundwaters,
- (8) John Mull with active research on ecology of endangered plants species in urbanizing environments,
- (9) Heather Root with active research on lichen ecology and pollution deposition,
- (10) John Sohl with active research on air pollution and other atmospheric conditions along the Wasatch Front.

One COS faculty member, Heather Root, also is involved with the Ogden Urban Forestry Committee, which might be a natural partnership for this hire. An urban ecologist might also be a natural collaborator with the successful Science in the Parks summer program.

There is also ongoing collaboration among faculty in the College of Science who are working with WSU Facilities Management to develop and measure impacts of sustainability projects. For instance, Carie Frantz, Bridget Hilbig, and Brandon Burnett are working with FM to implement a bioremediation strategy for cleaning up nitrogen in runoff to the campus-retaining pond and there is discussion of developing course projects related to water conservation and quality on campus.

Further, urban ecology is perhaps even more of a multidisciplinary field than general ecology because it incorporates human-specific factors. This emphasis melds the science of ecology with various social sciences such as geography and sociology. The Environmental Studies program in the Department of Geography could be a natural ally of an urban ecologist. Potential collaborators with complementary interests in the College of Social and Behavioral Sciences include (in alphabetical order):

- (1) Dan Bedford (Geography, research on climate change)
- (2) Jennifer Bodine (Sustainability Coordinator, Facilities Management)
- (3) Jeremy Bryson (Geography, research on urban geography, recommended by Dan Bedford and Carla Koons Trentelman)
- (4) Bryan Dorsey (Geography, research on land used and transportation planning, sustainable development)
- (5) Cass Morgan (Program Director of Outdoor and Community Recreation Education)
- (6) Alice Mulder (Director, Sustainability Practices and Research Center, Geography)
- (7) Carla Koons Trentelman (environmental and natural resource sociologist focused on attitudes about water & water issues on campus)

Other on-campus entities that may provide collaborative opportunities for this hire are the Sustainability Practices and Research Center and various initiatives associated with the Environmental Issues Committee (<http://www.weber.edu/environment>). Teaching and research in urban ecology may also lend itself to other sorts of multidisciplinary efforts such as improving K-12 education in the life sciences or using research projects to engage underserved students in research and develop skills in quantitative analysis, problem solving, and communication.

Potential collaborators off campus include state agencies such as the Utah Division of Wildlife Resources (involved in urban animal management), the Utah Division of Environmental Quality (concerned with all aspects of urban ecology), and Utah State Parks (several urban / suburban parks, including Antelope Island State Park in Davis County, <https://stateparks.utah.gov/parks/antelope-island/>). Possible collaborations with federal agencies include those along the urban-rural interface, such as U.S. Bureau of Land Management, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Geological Survey, and U.S. Forest Service. Utah Counties also manage

ecological resources, such as Davis County trails (<https://www.playindavis.com/places-to-play/listing/davis-county-trail-maps>). Local municipalities, like the City of Ogden, have interest in environmental quality and greenspace, as in the Ogden River Parkway Trail, which accompanies the recent Ogden River restoration (<http://www.riverrestoration.org/ogden-river-restoration.html>). In addition, the Ogden School District, and especially Shadow Valley Elementary, which has an environmental focus, would be a potential collaborator. In addition, a number of local charter schools, including the Greenwood Charter School focused on environmental stewardship, provide a number of opportunities for local outreach and community involvement. Local nonprofits such as the Ogden Nature Center, Weber Pathways, and the Nature Conservancy (e.g. Great Salt Lake Shorelands Preserve) are actively involved in outdoor education and recreation and well connected with WSU, making them additional potential collaborators.

The hire might also be able to collaborate with the Onaqui-Ault site of NSF's National Ecological Observatory Network (NEON) located southwest of Salt Lake in the Great Basin Desert. NEON will soon begin to collect long-term data along what it calls an "arid urban-rural network." These data will be available to address a range of research topics in urban ecology.

Finally, there may be opportunity for collaboration with researchers from other USHE institutions. At the University of Utah, Professor Diane E. Pataki (for example) studies the role of vegetation in the functioning of cities (https://faculty.utah.edu/u0188542-DIANE_E_PATAKI/biography/index.html) and is Specialty Chief Editor for the Urban Ecology section in *Frontiers in Ecology and Evolution* (<http://journal.frontiersin.org/journal/ecology-and-evolution/section/urban-ecology>).

In any case, we expect an urban ecologist engaging in some of the collaborations described above (or similar ones) will increase potential for student internships and employment opportunities along the Wasatch Front. We expect that productive research in this field will further increase the visibility of WSU, the College of Science, and the Department of Zoology within the region.