

THE WORLD NEEDS MORE WONDER
UNIVERSITY OF WYOMING'S
BIODIVERSITY INSTITUTE

2021



UNIVERSITY
OF WYOMING

Biodiversity Institute



Community scientists walk among the Mullen Fire scars in Medicine Bow National Forest. Nearly 50 people joined us for a hike to learn about fire ecology and kicked off the Mullen Wildfire Community Science Initiative. More information available on page 20.

MISSION:

The Biodiversity Institute fosters the understanding, appreciation and conservation of biological diversity through innovative research, education, and outreach, and by engaging a broad audience in the scientific process.

The Institute works with scientists, resource managers, educators, and the public to further the understanding and conservation of biodiversity. We seek to provide a unique service to Wyoming, our nation and the world by facilitating collaborative research projects, synthesizing and disseminating research, distributing grants, and providing educational, outreach, and community science programs for students and the public.

FOLLOW US:

-  Facebook: @TheBiodiversityInstitute
-  Instagram: @BiodiversityInstitute
-  Twitter: @WyoBio
-  Website: www.wyomingbiodiversity.org

DONATIONS:

Donations accepted year-round at www.wyomingbiodiversity.org

ON THE COVER:

Ph.D. student Jordan Von Eggers gathers soil sediment samples. More about this Graduate Student Enhancement Grant recipient on page 19.

2021 Wyoming Naturalists join Dorothy Tuthill for a field training at Boysen State Park
Photo courtesy: Kathy Lichtendahl



*THE WORLD NEEDS MORE
UNSHAKABLE DETERMINATION*

Brent Ewers, Director
Brian Barber, Science Communication Specialist
Kathe Carlton, Accountant
Mason Lee, Senior Project Coordinator
Bethann Garramon Merkle, Broader Impacts Assessment Director
Erendira Abbey Morales, Communications and Marketing Specialist
Bryce Tugwell, Digital Communications Director
Dorothy Tuthill, Associate Director and Education Coordinator

AWARD-WINNING WYOMING NATURALIST PROGRAM

In 2020, Wyoming was one of a small minority of states that did not have a Naturalist Program. In 2021 that changed with the launch of the Wyoming Naturalist Program! Coordinated by a committee of state agencies and non-profits that includes the Biodiversity Institute, Audubon Rockies, Wyoming State Parks, Wyoming Game and Fish Department and UW Extension, the Wyoming Naturalist Program completed its first year with many kudos and an award from the Alliance of Natural Resource Outreach and Service Programs.

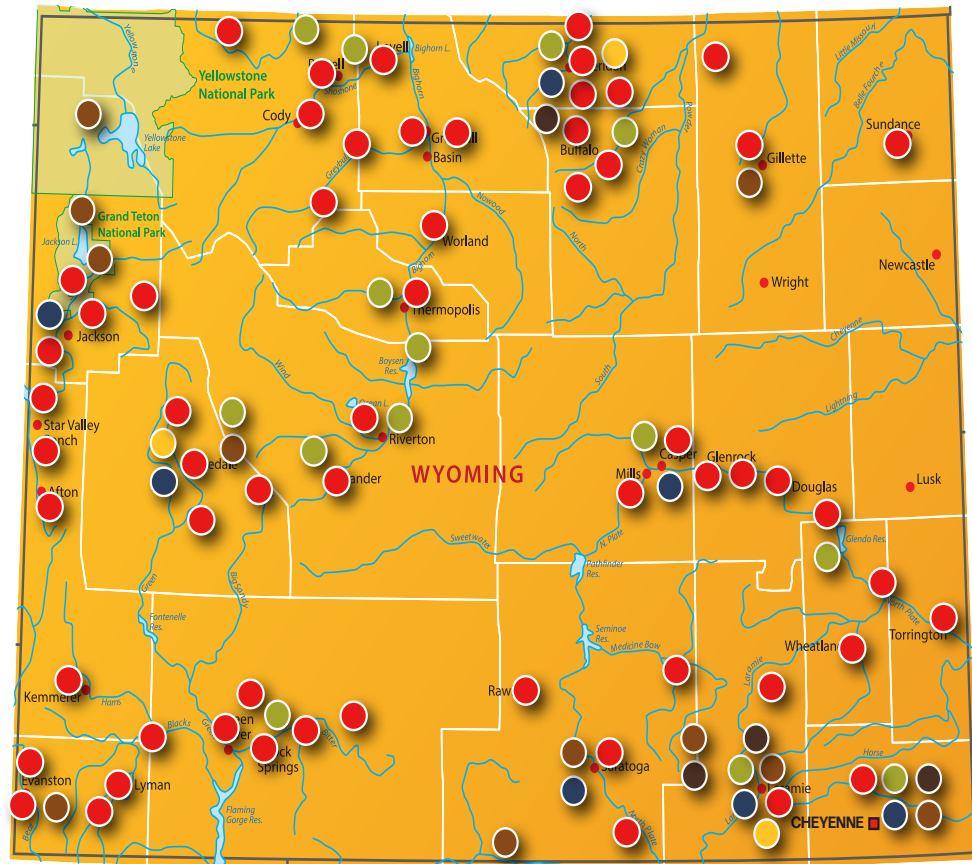
The program provides education and training to participants in biodiversity, ecology, conservation, management and interpretation, so that they can become leaders in the effort to protect our natural resources and the special places where we live.

Nineteen participants completed more than 40 hours of instruction each, and 13 also contributed a minimum of 40 hours of volunteer service to become Certified Wyoming Naturalists. In total, they contributed more than 600 hours to conservation in our state! The 2022 cohort will begin training in February.



The 2021 Class of the Wyoming Naturalist Program
Photo courtesy: Kathy Lichtendahl

BIODIVERSITY INSTITUTE CONNECTS WITH COMMUNITIES



- Community Science
- K-12 Education
- Wyoming Naturalist Program
- Educational Outreach
- BI-Funded Research
- Biodiversity Institute Friends



Ph.D. student Douglas Kamaru (right) is investigating landscape change and predator-prey dynamics in Kenya. He is one of this year's Graduate Student Enhancement Grant recipients.

In 2021, our Wyoming-rooted programs continued to grow beyond state lines to national and international levels. We had BI-funded research, partnerships, and outreach programs occur in Wyoming and around the world, including field sites in California and Washington, the African Savanna, and one of the world's most biodiversity-rich areas - Soberania National Park in Panama.

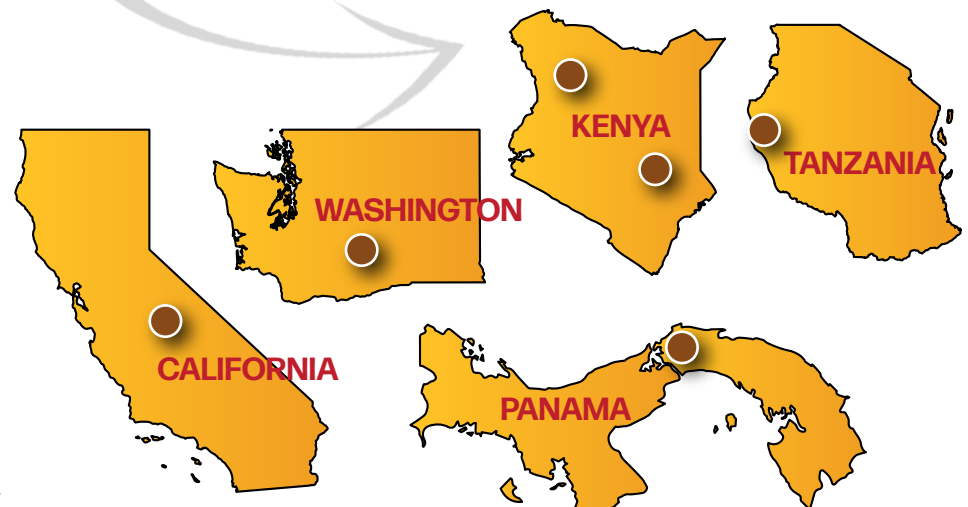


Photo courtesy: Chris Vrba



BAT WALKS

The Bat Walk program expanded across Wyoming this year, with walks held in Sheridan, Laramie, Cheyenne, and Casper. Over 120 people joined us on these Bat Walks!

Attendees on the Bat Walks loved being able to see and hear bats as they hunted insects in front of us, and reported that the coolest thing they learned was how bats can help farmers. In addition to the Bat Walks, we also held our first ever “Build-a-Bat” craft event. Participants made needle-felted bats, cotton ball bats, and colored in bat masks and coloring sheets.

Would you like a Bat Walk hosted in your community? Let us know at biodiversity@uwyo.edu.

COMMUNICATIONS CORNER



In September, we launched a digital monthly newsletter that was sent to our friends' inbox every Full Moon. Each issue features great stories of biodiversity research or keeps our readers informed of our upcoming events and volunteer opportunities. To subscribe, visit <https://bit.ly/FullMoonNewsletter>

Want to learn about snails, mayflies, or parasitic plants? For all of 2021 (and several previous years), the BI has been introducing young readers to Wyoming plants and animals through WREN, the magazine of the Wyoming Rural Electric Association. We're especially proud that many of the articles feature illustrations by our own graphic arts interns. Show the young reader in your family at <https://bit.ly/WRENKidsCorner>

ONLINE GIFT SHOP

Visit our online store for books, field guides, stickers, children's books, and our newly launched plant flashcards. Each item explores the rich biodiversity of Wyoming



www.wyobiodiversity.org

DIRECTOR'S LETTER

Leveraging Success into the Future

2021 was a challenging yet stimulating year for the Biodiversity Institute (BI). Despite the challenges of the ongoing pandemic, we continued moving towards our vision of being a world class resource for biodiversity research, education, and outreach for Wyoming, the Rocky Mountain region, and across the globe.



One focus of the BI is to support innovative outreach. Through our Novel Outreach and Education Grants, we supported the creation of a documentary showcasing three soil scientists' amazing run across the desert southwest in an effort to change how soils are viewed by the public, as well as an art show that beautifully showcased UW research into how bird species hybridization in the Great Plains and Intermountain West is responding to climate change. The BI continued staff-led education and outreach efforts both virtually and in-person. We facilitated the training of the inaugural class of the Wyoming Naturalist Program. We virtually gathered regional experts in hunting and fishing research, law, art, and diversity and inclusion to hold our first Stewarding Wyoming Landscapes through Hunting and Fishing event. We met in person for outdoor programs such as Wyoming BioBlitz, Bat Walks, and the new Mullen Fire Community Science Initiative. We look forward to seeing you both virtually and in-person in 2022 as we continue to expand our outreach program offerings.

Another focus of the BI is to support graduate student research that helps us understand how biodiversity contributes to ecosystem services and how it is generated, maintained, and restored. We invest heavily in graduate students because their work directly addresses issues of conservation concern today, and sets them up with the tools,



approaches, and leadership skills they need to be the leaders who address future biodiversity issues. This year we were able to support 12 students, more than we ever have before, a direct result of generous gifts to the BI. These students are studying biodiversity in Wyoming and around the world, and focusing on topics as diverse as the causes of rarity in plants, the effects of invasive species on landscapes and predator-prey relationships, how animals adapt to and use human-affected habitats, and how Indigenous and non-Indigenous people value biodiversity.

The BI was able to support these great biodiversity research and outreach programs through sustained support from the University of Wyoming Office of Research and Economic Development (ORED) for our operations, the UW Foundation for our fundraising efforts, and the incredibly generous support of our major donors and friends of the BI. We have doubled our friends of the BI from ~400 to over 800 people in the last two years. I am thus extremely pleased to present the rest of this BI annual report illustrating the successes of 2021 and opportunities to support our work. On behalf of the BI team, please join us in continuing to build the BI into a world class resource for biodiversity research, outreach, and connecting science to society.

Together,

A handwritten signature in black ink, which appears to read "Brent Ewers".

Brent Ewers
Biodiversity Institute Director

THE WORLD NEEDS MORE OUTSIDE THINKERS

The grants and programs we offer are funded by generous donors who support biodiversity research and the innovative work of talented UW students. We are proud to recognize this extraordinary group of supporters, who share our commitment to student research and biodiversity science.



Drs. Michael and Edie Allen Biodiversity Excellence Legacy Fund supports the future of the Biodiversity Institute in any area of biodiversity excellence.

The Richard Baldes Native American Excellence Fund in Biodiversity Conservation supports biodiversity conservation graduate assistantships and grants to Wind River Indian Reservation and Native American students who are enrolled at the University of Wyoming.



The Hardy Family Community Science Excellence Fund supports the BI K-12 and Community Science outreach programs in order to expand the understanding, practice, and application of science to all ages, particularly as related to the vital role of biodiversity.



Don and Judy Legerski UW Teton Graduate Scholars in Biodiversity Fellowship supports biodiversity research associated with the mission of the University of Wyoming AMK Ranch.

The Ann and Richard Boelter Biodiversity and Conservation K-12 Excellence Fund fosters excellence and provides financial support to our K-12 outreach and education programs.



Generous donors make it possible for us to maintain and grow our programs. We cannot say it enough - Thank you, thank you, thank you. Below are the 100+ donors from October 1, 2020 through November 15, 2021.

MAJOR GIFTS

Michael and Edith Allen
 Richard and Ann Boelter
 Bridget Hardy
 Donald and Judy Legerski
 Mark Headley and Christina Pehl

2021 DONORS AND FRIENDS OF BIODIVERSITY

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 Elizabeth & Joseph Waner
 Randolph & Stephanie Weigel
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 Janna Wittenberg



OPPORTUNITIES FOR PRIVATE SUPPORT

RECENT FUNDRAISING SUCCESS

The Biodiversity Institute surpassed our 2021-22 fundraising goal of \$150,000. Our major donors also provided additional pledges and endowment totaling \$250,000. In October, supporters from all over the country contributed \$65,000 for UW’s Giving Day, including one major gift toward our graduate student research grants.

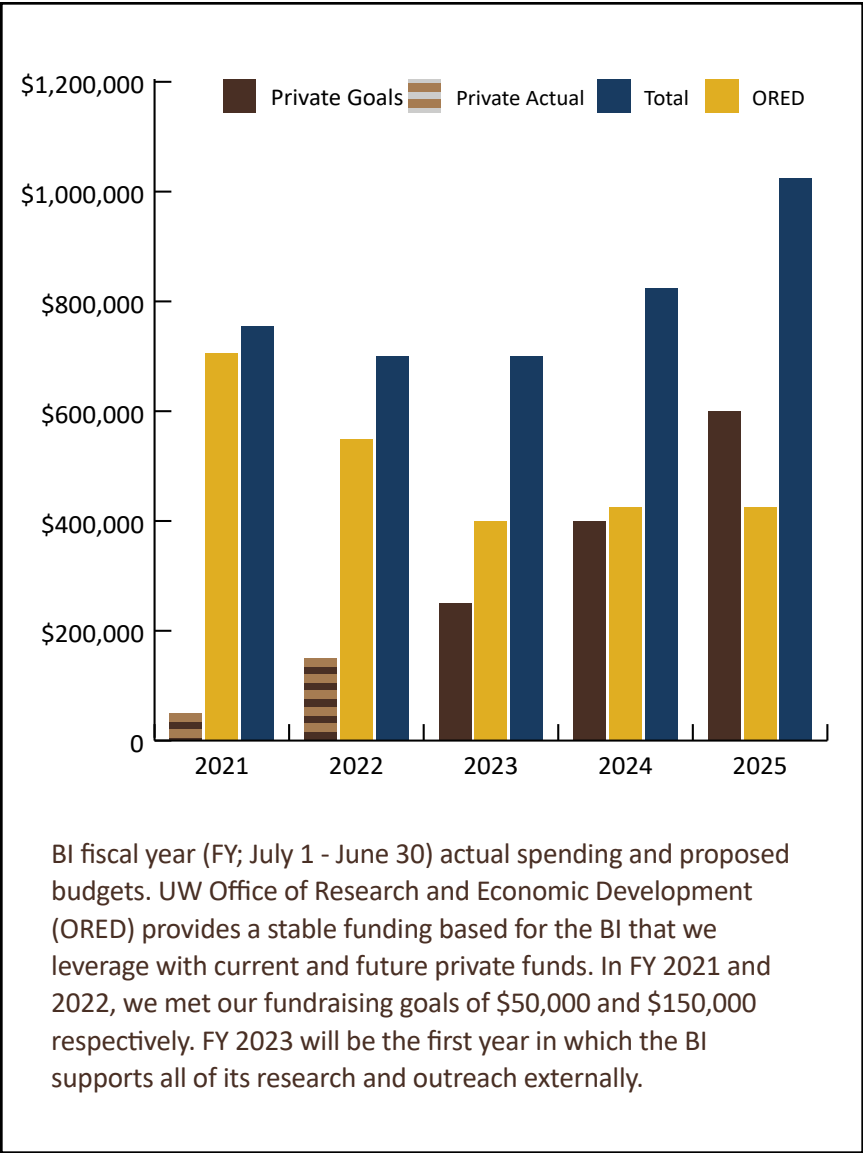
MAJOR GIVING

Gifts of \$25,000+ secure a strategic role for excellence in the advancement of biodiversity research, along with naming rights. Donors receive exclusive invitations and contribute to our strategic vision.

ANNUAL GIVING

Your annual gifts support community science, K-12 education, graduate student research in biodiversity science, and novel outreach to communities like yours.

To learn more about donor opportunities, email beewers@uwyo.edu. To make a gift, please visit www.wyomingbiodiversity.org



FRIENDS OF BIODIVERSITY

Over 50 Friends of Biodiversity came together in 24 hours to contribute \$65,000 for Giving Day in October. Gifts, of any size, improve our ability to solve grand societal challenges of how biodiversity is generated, maintained, restored, and its impact on ecosystem services and human well-being.

PLEASE HELP US BUILD CAPACITY FOR EXCELLENCE BY SUPPORTING OUR CORE PRIORITY AREAS:

COMMUNITY SCIENCE, EDUCATION & OUTREACH: \$5,000 ANNUALLY PER PROGRAM

- Wyoming BioBlitz
- K-12 Programs and Tours
- Bi-annual Moose Day
- Rocky Mountain Amphibian Project
- Art + Biodiversity Exhibitions
- Monarchs & Milkweeds
- Wind River Reservation Outreach
- Stewarding Wyoming's Landscape through Hunting and Fishing
- Field Guides with Friends

PUBLICATIONS: \$5,000-\$25,000

Publication grants provide funds to translate research into books, field guides, and other printed material that communicate the value of biodiversity and its positive societal impacts.

EARLY CAREER RESEARCH: \$100,000 PER SCHOLAR

This post-doctoral scholar and early career researcher program stimulates cutting-edge biodiversity research, education, and outreach. These exceptional individuals will accelerate biodiversity discoveries, elevate the national and international reputation of UW, and contribute critical insights to solving grand challenges in Wyoming and beyond.

GRADUATE STUDENT RESEARCH ENHANCEMENT GRANTS: \$20,000 PER AWARD

Competitive grants awarded to multiple UW graduate students annually who demonstrate excellence in student-driven biodiversity research and communicate their research to diverse audiences.



JORDAN VON EGGERS, 2021 GRADUATE STUDENT RESEARCH ENHANCEMENT GRANT AWARDEE

"This aid will support my transition from a M.S. to a Ph.D. program here at UW as I expand my project from alpine lakes in [the] Wind River Range, Wyoming to include more lake sites in the western United States (California, Washington, and Grand Teton National Park in Wyoming). Support from the Biodiversity Institute will allow me to concentrate my time on processing the 13 new sediment cores I collected this summer in order to jumpstart my Ph.D. program and get one step closer to understanding how biodiversity is created and maintained in alpine aquatic ecosystems."

STUDYING WILDFIRE IMPACTS

The Mullen Fire burned over 175,000 acres in the Medicine Bow National Forest in 2020. UW Master's student Tanner Hoffman, in cooperation with the USDA Forest Service, is studying the short-term and long-term effects from the Mullen Fire on soil microbial and vegetation community recovery in the sagebrush-steppe ecosystems adjacent to the forests. He also plans to include community members in his research by training them to help sample his many sites.

Tanner's project is the first to be awarded The Hardy Family Forest Disturbance Community Excellence Fund, which was made available through the annual Graduate Student Research Enhancement Grants Program. In 2021, we were able to fund nine projects and provide three additional students with supplement grants.

Community scientists join Tanner Hoffman at a field trip to a Mullen Fire impacted site in Fall 2021.

THE HARDY FAMILY COMMUNITY SCIENCE EXCELLENCE FUND



Tanner Hoffman taking soil samples.

Wyomingite and long-term UW supporter Bridget Hardy established The Hardy Family Community Science Excellence Fund to support research that focuses on regeneration following the 2020 Mullen Fire and includes UW researchers and community scientists in the co-creation of knowledge.

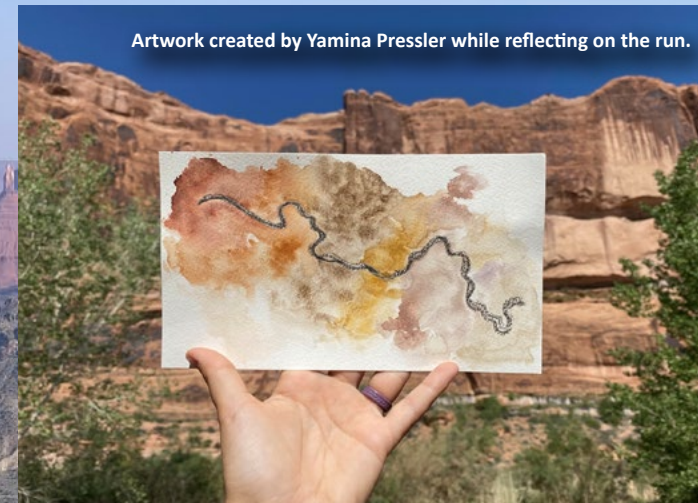
"Not only is Tanner's work on cheatgrass integral to wildfire proliferation, it is an area that ranchers are deeply concerned about and community members can study directly in nearly all parts of Wyoming," says Hardy.

THREE WOMEN, SOIL SCIENTISTS AND TRAIL RUNNERS attempt to change the way we view soils one mile at a time.



**NOVEL
OUTREACH
GRANTS:
\$20,000 PER
AWARD**

Competitive grants are awarded to UW student and faculty groups that use creative, novel, evidence-based, and high impact approaches to communicate the value of biodiversity research to the public.



Artwork created by Yamina Pressler while reflecting on the run.

Will Run for Soil is a documentary that follows Karen Vaughan (University of Wyoming pedologist), Yamina Pressler (California Polytechnic State University soil ecologist), and Lydia Jennings (University of Arizona Ph.D. student and soil microbiologist), as they explore soils while running through the sweeping wilderness of the desert southwest.

“The Novel Outreach Grant from the Biodiversity Institute is integral to the success of this project - with the award, we were able to realize a matching award that will, combined with other funding, allow us to share the importance and wonder of soil with a large audience.” The film is coming in 2022. Stay up to date at www.willrunforsoil.com

Lydia Jennings, Karen Vaughan, and Yamina Pressler look over Castle Valley along the Porcupine Rim Trail on their final day of their run.



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