# University of Wyoming – National Park Service Research Station

41<sup>st</sup> Annual Report, 2018



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### 2018 UW-NPS Research Station Personnel

Michael Dillon, Director Hank Harlow, Guest Director Harold Bergman, Guest Director Bonnie Robinson, Office Manager Gordon Richman, Facilities Superintendent Bruce Cameron, Facilities Staff Andy Bergin, Facilities Staff Rich Viola, Facilities Staff Abby Dreibelbis, Summer Staff Anna Cressman, Summer Staff Elyce Gosselin, Summer Staff Tim Uttenhove, Summer Staff

## 2018 Proposal Review Committee

Michael Dillon Director, UW-NPS Research Station Associate Professor Department of Zoology & Physiology and Program in Ecology University of Wyoming

> Ron Frost, Professor Department of Geology University of Wyoming

Jacob Goheen, Assistant Professor Department of Zoology & Physiology University of Wyoming

J. Patrick Kelley, Research Scientist Department of Zoology & Physiology University of Wyoming

Sue Consolo-Murphy Chief of Science and Resources Management Grand Teton National Park

> Sarah Haas Center for Resources Yellowstone National Park

## Director's Column 41<sup>st</sup> Annual Report 2018

During the period of this report the University of Wyoming-National Park Service (UW-NPS) Research Station supported and administered research in the biological, physical and social sciences and cultural resources performed in national parks, national forests and surrounding areas in the Greater Yellowstone Ecosystem. The UW-NPS Research Station solicited research proposals from university faculty, governmental research scientists and non-governmental research organizations throughout North America via a request for proposals. Research proposals addressed topics of interest to National Park Service scientists, resource managers, and administrators as well as the academic community. Studies conducted through the Station dealt with questions of direct management importance as well as those of a basic scientific nature.

The Research Station continues to administer a small grants program to fund research addressing applied and basic scientific questions, often related to park management. Research proposals are reviewed and evaluated by the Research Station's proposal review committee, which is composed of University faculty and National Park Service representatives and is chaired by the Director of the UW-NPS Research Station. Research contracts are usually awarded by early April.

The UW-NPS Research Station operates a field station facility at the AMK Ranch on Jackson Lake in Grand Teton National Park. The Research Station provides researchers in the biological, physical and social sciences and cultural resources an enhanced opportunity to work in the diverse aquatic and terrestrial environments and the cultural resources of Grand Teton National Park, Yellowstone National Park and the surrounding Greater Yellowstone Ecosystem. Station facilities include housing for up to 60 researchers, wet and dry laboratories, a library with internet access, an herbarium, boats, and shop facilities. The research station is available to researchers working in the Greater Yellowstone Ecosystem regardless of funding source, although priority is given to individuals whose projects are funded by the Research Station.

A summary of the 2018 users and activities at the Station is included below. Additional information about the UW-NPS Research Station, including the current year's Request for Proposals, housing and facilities request forms, summaries of past and current research, upcoming seminars and other events, and location information, can be found at the station's web site: http://uwnps.org/.

### Availability of Research Project Reports

The following project reports have been prepared primarily for administrative use. The information reported is preliminary and may be subject to change as investigations continue. Consequently, information presented may not be used without written permission from the author(s). Reports from past research at the Research Station are available online. For reports 1954, go to the Jackson Hole Research Station Archives (https://journals.uwyo. edu/index.php/jhrs/issue/archive), and for reports 1977-present, visit the UW-NPS Research Station Archives (https://journals.uwyo.edu/index.php/uwnpsrc/issue/archive).

### 2018 UW-NPS Research Station Users and Activities Summary (3,439 total user-days)

- ▲ Funded by the UW-NPS seed grants program
- ★ Direct impact on UW: direct involvement of UW faculty or students
- Direct impact on WY: direct involvement with or addressing priorities of state agencies

#### Research projects with residence at the station

42 research teams with 1 to 12 researchers from UW, other colleges, universities, high schools, community colleges, businesses, and federal and state agencies – 1769 user days

- ▲ ★ University of Wyoming Aquatic ecosystem ecology 3 researchers 6 day use guests
  - University of Wyoming Assessing thermal tolerance of vulnerable alpine stream insects in the Teton Range, WY – 4 researchers – 2 days
  - University of Wyoming Evaluating the use of redd counts in monitoring Snake River Cutthroat in Snake River tributaries – 3 researchers – 6 days
  - ★ University of Wyoming Microbial ecology of Wyoming plants 1 researcher 1 day
  - ★ University of Wyoming Spatial ecology of beavers 1 researcher 5 days
  - University of Wyoming Long-term survey of Polecat Creek for invasive mudsnails 8 researchers 14 days
  - ★ University of Wyoming Wyoming Migration Initiative 10 researchers 100 days
  - ★ University of Wyoming, Biodiversity Research Institute Wildlife research 8 researchers 64 days
  - Boise State University Space use and roosting sites of GTNP bats 5 researchers 149 days Brandeis University – History of John Sargent and Richard Hamilton – 1 researcher – 3 days Colorado State University – Pollinators – 4 researchers – 24 days

Colorado State University – Thermal tolerance of vulnerable alpine stream insects – 1 researcher – 7 days

Frostburg State University – River otter: remote camera trapping – 2 researchers – 23 days Gossamer labs – Spiders – 2 researchers – 44 days

- Laramie County Community College/University of Wyoming Yellowstone fire study 2 researchers 8 days
  - Leave No Trace Center for Outdoor Ethics Exploring visitor, NPS staff, and concession staff attitudes and behaviors regarding waste in national parks 2 researchers 54 days

Miles O'Brien Productions – Wildfires – 3 researchers – 12 days

Montana State University – Butterflies, plants and climate change – 6 researchers – 207 days

Montana State University – Optical sensing of the effect of light pollution on insect distribution – 6 researchers – 33 days

Montana State University – Wetlands – 2 researchers – 2 days

- National Park Service LIDAR studies of insect and bat responses to lights 1 researcher 12 days
- National Park Service Submerged shipwreck documentation and baseline data survey 4 researchers – 40 days
  - Occidental College Reconstructing the climatic and tectonic history of the Teton Range using lake sediments 4 researchers 8 days

Oregon State University – Visitor use and visitor experience study – 1 researcher – 53 days

- Pennsylvania State University Exploring visitor, NPS staff, and concession staff attitudes and behaviors regarding waste in national parks 1 researcher 5 days
- Pennsylvania State University Visitor use study of the String and Leigh Lakes area 2 researchers 120 days

- Pennsylvania State University A survey research on Chinese visitors in Grand Teton National Park 1 researcher – 61 days
  - Rutgers University Collecting drosophila 2 researchers 2 days
- ▲ Texas State University Geomorphological research 2 researchers 56 days
  - U.S. Geological Survey Investigating brain-eating amoeba in Grand Teton Hot Springs 5 researchers 5 days
  - University of Colorado Testing the effects of shortened fire-return intervals in the US and Australia 5 researchers 25 days
  - University of Illinois at Urbana-Champaign Visit and prospection of future study sites 4 researchers 4 days
  - University of Kentucky Alpine fieldwork in the Teton Range 4 researchers 4 days
  - University of Kentucky Seismic profiling of Jackson Lake 7 researchers 42 days
  - University of Montana Microclimates on leaf surfaces 4 researchers 24 days
  - University of Montana Nitrogen cycling in post-fire lodgepole pine ecosystems 1 researcher 3 days University of Oklahoma – Community responses to post-fire succession – 12 researchers – 228 days University of the Sunshine Coast – Public value – 2 researchers – 6 days
  - University of Wisconsin-Madison Post-fire conifer regeneration 6 researchers 77 days
- ▲ Utah State University Forecasting eco-evolutionary dynamics in the Northern Blue butterfly (*Lycaides idas*) 3 researchers 81 days

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Utah State University – Visitor use and visitor experience study – 3 researchers – 138 days
Woods Hole Oceanographic Inst – Limnology of Yellowstone Lake – 3 researchers – 13 days
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#### **Classes and field research courses**

16 classes on Art, Ecology, Geology, pollinators, invasive plants, landscape erosion, and wildlife from UW, and 11 other universities, community colleges, State and Federal agencies – 1093 user days

- ★ University of Wyoming Art in the outdoors 10 students/1 instructor 7 days
- ★ University of Wyoming Forest ecology 5 students/1 instructor 1 day
- ★ University of Wyoming Geology of Yellowstone and Tetons 15 students/2 instructors 3 days
- ★ University of Wyoming Near-surface/shallow geophysics 12 students/2 instructors 2 days
- University of Wyoming Program in ecology 16 students/4 instructors 4 days
   Clayton High School Behavioral ecology of sagebrush crickets 9 students/3 instructors 13 days
   Colorado State University Pollinators 19 students/5 instructors 6 days
- Laramie County Community College Geology of the Grand Tetons and Yellowstone National Parks 11 students/2 instructors – 6 days
- National Park Service Invasive plant identification 30 students/2 instructors 2 days Oklahoma City University – Ecology of Greater Yellowstone – 10 students, 1 instructor – 6 days University of Arkansas at Little Rock – Rocky Mountain ecology – 6 students, 1 instructor – 1 day University of Kentucky – Landscape erosion – 15 students, 3 instructors – 13 days University of Nebraska-Lincoln – Pedagogy and geology – 7 students, 3 faculty – 2 days University of Pittsburgh – Geology and ecology – 15 students, 3 instructors – 3 days West Virginia University – Photography/art/ecology – 15 students, 1 instructor – 5 days
- Wyoming Game & Fish Department Wildlife disease, feedgrounds, and migration 6 students, 2 instructors – 2 days

#### Workshops and meetings

12 workshops and meetings on environmental policy, atmosphere-land interactions, photography, sensory biology, cultural studies, INBRE, bioacoustics, bear immobilization, climate adaptation, grouse, and migratory elk and deer – 1057 user days, 15 day use guests

- ★ University of Wyoming 2018 Jackson Hole Summit 2 days
- University of Wyoming Collaborative governance in environmental policy and natural resource management – 83 days
- ★ University of Wyoming Critical problems in atmosphere-land interactions in the earth system 60 days
- ★ University of Wyoming Photography conference 198 days
- ★ University of Wyoming Sensory biology symposium 236 days
- ★ University of Wyoming Tohoku cultural study tour 80 days
- University of Wyoming Wyoming INBRE retreat 156 days Boise State University – Bioacoustics workshop – 102 days
- National Park Service Bear immobilization training 40 days
- National Park Service GYCC coordinating committee, climate adaptation 60 days Utah State University – Grouse Symposium – 40 days
- Wyoming Game & Fish Department Migratory elk and deer conference 15 day use guests

#### Interns resident at the station

2 interns co-funded by UW and GTNP and selected competitively for work with GTNP staff. – 188 user days

- ▲ National Park Service Ecology of bats, research and management 79 days
- ▲ National Park Service Visitor use and experience in GTNP 109 days

#### Residencies

2 residencies in writing and music composition - 27 user days

- ★ University of Wyoming Music composition 15 days
- Tara Papas Art Mixed-media art 12 days

#### Harlow Summer Seminars – UW-NPS Research Station at the AMK Ranch

Weekly seminars and special events from mid-June to mid-September with a \$5 donation for a BBQ dinner followed by a seminar – 191 user days, 918 day use guests.

- Wyoming's sage-grouse core area strategy: is it effective? Jeffrey L. Beck, University of Wyoming, Laramie, WY (June 21)
- Connected Conservation: History and management at the arctic and national elk refuges Brian Glaspell, National Elk Refuge, Jackson, WY (June 20)
- Butterfly and plant responses to climate change in montane meadows of GTNP Diane Debinski, Montana State University, Bozeman, MT (July 5)
- Anatomy of Old Faithful and Yellowstone, Earth's core to hot springs and geysers Robert B. Smith, University of Utah, Salt Lake City, UT (July 12)
- Living with climate change: can behavior help pikas and other sensitive species cope? Embere Hall, University of Wyoming, Laramie, WY (July 19)

- Living with climate change: can behavior help pikas and other sensitive species cope? Mark Elbroch, Panthera Puma Program, Kelly, WY (July 26)
- The Tetons are calling and we must go: using science-based approaches to understand visitor use and experience at String and Leigh Lakes Will Rice, Pennsylvania State University, State College, PA & Jenna Baker, Oregon State University, Corvallis, OR (August 2)
- 3<sup>rd</sup> Annual Wyoming festival new music in the mountains Anne Guzzo, University of Wyoming, Laramie, WY (August 9)
- Deep migrations: human connections to ungulate movement in Wyoming Gregory Nickerson & Bailey Russel, University of Wyoming, Laramie, WY (August 16)
- Human/Nature Jesse Burke, Rhode Island School of Design, Providence, RI (September 22)

#### Outreach

4 outreach areas in music, Bavarian Forest National Park, OBFS, and US Forest Service - 150 user days

- Jeff Lockwood, Anne Guzzo, Locust opera September 28, 29
   Bavarian Forest National Park Professional tour September 12-15
   Organization of Biological Field Stations, Auction winner June 19-25
- US Forest Service, Auction winner May 17-19