



Station Activities

Andrew Nelson

Nelson Robotics, Tucson, AZ. anelson@ieee.org

During a short artist's residence at the UW-NPS Research Station in Teton National Park, Dr. Andrew Lincoln Nelson produced graphic studies, compiled observations and made photographic records of Teton flora and landscapes in support of a series of fine-art graphite drawings. This project represents a fusion of artistic expression and the research fields of artificial life and evolutionary computation. The drawings in the series explore various aspects of exobiology and possible Earth ecosystems of the distant future. Although Nelson's work contains some surreal aspects, it is also directly inspired by theoretical concepts from biology and evolution. Plant morphology and terrestrial landscapes are major components of the work.

Observations made in the park include studies of plant morphology and metric drawings of the Teton Range as viewed from the boathouse dock at the research station. These observations and studies are being incorporated into a detailed graphite drawing of a plant-like agent that will be included in a portfolio of the larger series of fine-art drawings.



"Teton Research Station Dock" 2017 graphite drawing. The Tetons over Jackson Lake viewed from the University of Wyoming research station dock. This drawing was produced from sketches and photos created during Nelson's artist's residence in July 2017.



Polecat Creek in May 2017. High water made animal collection challenging.



Trevor Bloom on a wet hike up Death Canyon in Grand Teton National Park.

Daniel Greenwood

Department of Zoology and Physiology, University of Wyoming, Laramie, WY
dgreenw2@uwyo.edu

During our short stay at the UW-NPS research station, I and my field assistants traveled to Polecat Creek to collect freshwater invertebrates. Polecat Creek harbors a large population of invasive freshwater snails (*Potamopyrgus antipodarum*). Even though these snails dominate the invertebrate community in Polecat Creek, their current population density is approximately 15-fold less than researchers found in 2001. I hypothesize that native predators can help explain the decline of *P. antipodarum* in Polecat Creek, specifically flatworms in the genus *Dugesia*. Under laboratory conditions, I have shown that *Dugesia* flatworms will feed on *P. antipodarum*, albeit at a low rate. I collected the flatworms and snails used in these feeding trials during the fall of 2016. Because little is known about intra-annual changes in feeding behavior of *Dugesia* flatworms, I collected snails and flatworms in May of 2017 for use in another set of feeding trials. I want to know if predation rate is different during the spring than in the fall. If so, this research would shed light on the feeding behavior of *Dugesia* flatworms and, if the feeding rate is higher in spring, could implicate predation by native predators as a mechanism to explain the decline of *P. antipodarum* in Polecat Creek.

Ian Breckheimer

Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, MA
ian_breckheimer@fas.harvard.edu

Ian visited the University of Wyoming - National Park Service Research Station as part of a scoping trip for this postdoctoral research. Ian will be using crowd-sourced photos to track wildflower blooms in National Parks, and Grand Teton and Yellowstone National Parks are key sites for this work. To prepare for this work, Ian explored the park with local botanist Trevor Bloom and made preliminary observations of wildflower blooms.

Lucas Savoy¹, Susan Patla², Sean Boyd³, Malcolm McAdie⁴, John Stephenson⁵

- 1 Biodiversity Research Institute, Portland, ME; lucas.savoy@briloon.org
- 2 Wyoming Game and Fish Department, Jackson, WY
- 3 Environment and Climate Change Canada, Delta, BC, Canada
- 4 DVM, Nanaimo, BC, Canada
- 5 Grand Teton National Park, Moose, WY

During the spring 2016, a collaborative group of wildlife biologists and wildlife veterinarians initiated a Harlequin Duck migration study focused in western North America. Our objective was to investigate the timing, duration, and habitats used during the Harlequin Duck's migration from their mountain breeding streams to the Pacific coast molting and wintering areas. Field teams visited harlequin breeding streams in Washington, Montana, Wyoming, and Alberta, Canada. We captured breeding pairs of harlequins and attached specialized tracking devices designed to provide accurate locations and map their movements for up to 1 year. A total of 17 Harlequin Ducks were tracked throughout migration and to their Pacific coast locations.

In May 2017, the Wyoming field team visited streams in Grand Teton National Park in an effort to deploy additional satellite transmitters in male harlequins and retrieve the geolocator tracking devices installed on females from previous breeding seasons. The effort was highly successful, capturing a breeding pair of harlequins, in which we implanted the male with a satellite transmitter which provides real-time location data daily and recaptured the female from 2016 in order to retrieve a downloadable geolocator tracking device.

Project partners in Wyoming include: Grand Teton National Park, Wyoming Game and Fish Department, Biodiversity Research Institute, and Environment and Climate Change Canada. Funding for this project has been provided by the Wyoming Game and Fish Department (State Wildlife Fund), Meg and Bert Raynes Wildlife Fund, and the Wyoming Community Foundation. A project web page can be viewed at <http://www.briloon.org/harlequin-duck-study-in-wyoming>.



The Harlequin Duck field team in Grand Teton National Park. Left to right: Lucas Savoy, Malcolm McAdie, and Susan Patla. Photo credit: Susan Patla.



*Wyoming Game & Fish Biologist Susan Patla holding a recently captured Harlequin duck (*Histrionicus histrionicus*).*



Patla and colleagues take measurements and prepare to band a female Harlequin duck.



Male Harlequin duck with satellite transmitter attached, ready for release.

David D. Gustine

Branch Chief of Fish and Wildlife Program at Grand Teton, National Park Service, WY
 dave_gustine@nps.gov

From September 18th through 22nd 2017, the park hosted an NPS wildlife anesthesia course at the AMK Ranch. Around 30 NPS wildlife biologists from 11 National Parks attended, representing 5 of the 7 NPS Regions. Participants received instruction from NPS veterinarians and wildlife biologists in wildlife immobilization techniques, pharmacology, drug dose calculations, law and policy regarding the use of pharmaceuticals and capture equipment, animal welfare, and animal and human safety. A live-animal field capture was conducted (we caught and collared 1 mule deer at Colter Bay), and students had the opportunity to become familiar with various remote delivery systems on a range. This 40-hr course (or its equivalent) is required training for wildlife professionals in the NPS to implement safe capture and handling protocols that are often necessary for monitoring, managing, and research of wildlife in National Parks.

Tuesday, 19 September

0800	Introductions and Identification of Attendee Needs and Desired Outcomes (30m)	Wild
0830	Ethics and Public Relations (20m)	Powers
0900	NPS Policy and Special Concerns, A123 Intro (40m)	Wild
0930	Regulations on the Use of Pharmaceuticals (1h 30m)	Wild
1000	Break (15m)	
1015	Regulations on the Use of Pharmaceuticals (continued)	Wild
1115	Pharmacology, Part I (1h)	Powers
1215	Lunch (on site)	
1315	Pharmacology, Part II (1h 30m)	Powers
1445	Break (15m)	
1500	Introduction to Darting Equipment (including safety) (1h 15m)	Wild/group
1615	ACETA updates (45m)	Powers/Gustine
1700	Adjourn	

Wednesday, 20 September

0800	Dose Calculations (45m)	Powers
0845	Steps of Field Anesthesia (1h 15m)	Wild
1000	Break (15m)	
1015	Animal Safety and Emergency Treatment (1h 15m)	Powers
1130	Human Safety (1h)	Powers
1230	Lunch (on site)	
1330	Intro to Remote Delivery Systems at range, coupled with dart loading practice	Wild/Powers/group
1700	Adjourn	
1800?	Group Dinner	

Thursday, 21 September

0600	Field exercise (PLEASE NOTE EARLY START TIME) – Using BAM in Mule Deer	Wild/Powers/Gustine/Dewey
0600	Concurrent discussion: Anesthesia scenarios	Wild/Powers
1200	Lunch (on site)	
1300	Euthanasia (1h)	Powers
1400	Break (15m)	
1415	Establishing a Wildlife Capture and Anesthesia Prog./A123 (1h)	Wild
1515	Species-specific Considerations (30m)	Wild/Powers/group
1545	Adjourn	

Friday, 22 September

0800	Standard of care summary & Case Studies (1h)	Wild
0900	GRTE Management Discussion (1h)	Powers
1000	Break (15m)	
1015	Test and discussion (1h 30m)	Wild
1145	Adjourn	