

# Greater Yellowstone Network

## NEWSLETTER, Spring/Summer 2015

National Park Service  
U.S. Department of the Interior  
Inventory & Monitoring Program



We welcome the 2015 field season with mostly returning staff and safety remains our number one priority. We are also excited to have folks join us in the field and if you are interested in doing so or want to learn more about what we do, please contact us. For easy access to all reports, check out our website at: <http://science.nature.nps.gov/im/units/gryn/>.

### Monitoring Updates

#### Amphibians • Andrew Ray, Lead with Deb Patla, Northern Rockies Conservation Cooperative (NRCC)

In addition to annual monitoring, GRYN has several projects underway to understand the dynamics of amphibian populations in the Greater Yellowstone Ecosystem (GYE). In collaboration with the USGS and NRCC, we are conducting a multi-year analysis of amphibian occupancy in GRTE and YELL that explicitly examines how temperature and precipitation interact to fill wetlands and how these drivers influence amphibian breeding success across years and throughout the GYE. The USGS, GRYN, and university cooperators are finishing up a synthesis of ten years of amphibian monitoring across the Continental Divide in ROMO, GRTE, YELL, and GLAC that show the importance of beaver ponds to amphibians across the region. To further extend the regional extent of data, we are working with the Upper Columbia Basin Network (UCBN) and the USGS to expand amphibian monitoring protocols to the Big Hole National Battlefield. In addition, preliminary results from our collaborative project with the USGS and Washington State University show that environmental DNA (eDNA) can be used to describe amphibian assemblages in wetlands. While results appear to vary slightly from visual surveys, the potential to use eDNA for multi-species, multi-taxa monitoring may shed new light on benefits of GYE wetlands to regional biodiversity. Deb and Andrew are co-leading field monitoring again this year and plan to visit 32 catchments within GRTE and YELL.

#### Upland Vegetation • Kristin Legg, Lead with Mike Tercek, NRCC; Ken Stella, GRTE; Stefanie Wacker, YELL

To better understand the possible response of vegetation communities to climate, we are using precipitation and temperature metrics to report on the frequency and duration of drought in combination with the percent of the types of vegetation cover recorded in a given year. We would expect in more normal or wet years to see a greater percent cover than in dry years. In this fifth year of monitoring, field crews will collect plant and groundcover data from approximately 550 quadrats within 10 sample frames that target sagebrush steppe, Utah juniper, and curl-leaf mountain mahogany woodlands at Bighorn Canyon. We are implementing the fourth year of the sagebrush steppe monitoring in GRTE, and YELL is initiating a similar monitoring program this year.

#### Water Resources • Andrew Ray, Lead with Virginia DuBow, BICA; Kathy Mellander, GRTE; Ann Rodman, YELL; Adam Sigler, Montana State University

Monitoring water resources in 2015 will begin in March in BICA. Throughout the network, we will continue to focus on Outstanding Resource Waters, 303(d)-listed waters, and monitoring of spring habitats (BICA). At the upper Snake River and upper Yellowstone River sites we will use large-river sampling protocols. Because monitoring sites are co-located with USGS stream gages, we will document discharge, temperature, dissolved oxygen, suspended sediment, nutrient, and metal levels in monitored rivers. In addition, we are collaborating with the USGS and Dr. Mike Tercek on a synthesis of discharge patterns for rivers throughout the GYE. This synthesis is part of a multi-year project (entitled, *developing a mechanistic understanding between recent climate patterns and aquatic vital signs*) that integrates climate and discharge information for network parks and throughout the region. We will begin participating in a USGS-led two-year collaborative study of the sources, dynamics, and fate of mercury in BICA's Bighorn Lake. Lastly, we will work closely with YELL and Montana Department of Environmental Quality scientists on a project to use turbidity and 24-hour sampling to quantify metal loading in Soda Butte Creek following reclamation of an upstream tailings site.

#### Whitebark Pine • Erin Shanahan, Lead with the Greater Yellowstone Whitebark Pine Monitoring Working Group

The 2015 season marks the 12<sup>th</sup> year of monitoring the health and status of whitebark pine in the GYE. Field crews will work throughout the GYE to complete our 3<sup>rd</sup> time-step where all 176 transects will have been surveyed at least 3 times. In addition, we will continue to investigate the role of observer variability in infection estimates by conducting double-observer surveys on transects that have over 75 live, tagged trees. This information will increase confidence in our ability to estimate blister rust infection in the GYE.

		2015 Field Schedule											
		Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec		
BICA	Upland Veg												
	Water Resources												
GRTE	Amphibians												
	Upland Veg												
	Whitebark Pine												
YELL	Water Resources												
	Amphibians												
YELL	Whitebark Pine												
	Water Resources												

Continued ...

## Climate

Mike Tercek, in coordination with YELL and GRYN staff, added new features to the climate analyzer website including snow water equivalent and snow depth maps for the GYE and real-time air and stream temperature data. There is a Climate at a Glance Dashboard for each park. Find out more about the climate by visiting <http://www.climateanalyzer.org>.

## Climate Change

We are integrating climate data into our monitored vital signs and addressing those vital signs identified in the Climate Change Response Strategy. We are continuing with sage-steppe monitoring at GRTE as part of the upland vegetation monitoring program. We will visit the YELL GLORIA alpine vegetation site established in 2011 in the late summer to replace soil temperature sensors. The first full resample of this GLORIA site is scheduled for next year. David Thoma, in collaboration with numerous partners, continues to measure and model vegetation response to different climate variables, and is using a water balance approach to understand temperature and precipitation interactions.

## Vegetation Inventories

The Colorado Natural Heritage Program is finalizing the BICA vegetation inventory map and report this summer.

## Network Projects

We are collaborating with the Upper Columbia Basin Network, the USGS, and Mike Tercek to develop a visualization tool for upland vegetation monitoring. Known as VegViz, this tool will provide a way to view the long-term sagebrush steppe vegetation monitoring data collected across both networks. We anticipate that this tool will be available for testing later this year.

## Network Updates

Welcome to **Mary Levandowski**, our new hydrological technician! Mary graduated from the University of Arizona with a B.S. in Molecular and Cellular Biology. After graduating, she completed two Student Conservation Association internships at Saguaro National Park helping to coordinate a BioBlitz in 2011 and working on an exotic plant team. She then spent 2013 at the Mojave Desert Network working primarily on water resources as a physical science technician; in 2014, she led the water resources (springs) crew in the Chihuahuan Desert Network. Mary is excited to build on her experience with different water systems as part of the Greater Yellowstone Network.

Congratulations to GRYN intern **Olivia Kenney** on graduating from Montana State University with a bachelors degree in English Literature. Olivia wraps up her work with us this year, having added and improved hundreds of science information product records to update and maintain NPS inventories for the Natural Resource Bibliography and Species Lists for GRYN parks. Olivia worked diligently to prepare for archiving paper records from our past decade of science activities. We are working with NPS archivists to permanently store that material.

**Nina Chambers**, GRYN's science writer/editor, is moving on to a science communications position with the Alaska Region and the four Alaska I&M networks. We are in the process of identifying another writer to take over from Nina to meet our science communication needs.

## Communications

GRYN staff including Kristin, Andy, David, Erin, and Rob attended a science communication training by the Alan Alda Center for Communicating Science in Fort Collins in January. The training included a mix of interactive, written, and video communication techniques to clearly communicate science in an engaging way. We're looking forward to putting new ideas into practice in communicating our work.

For easy access to reports and briefs, check out our website (<http://science.nature.nps.gov/im/units/gryn/>).

## Recently published reports and articles include:

- Sagebrush Steppe Vegetation Monitoring in Grand Teton National Park, 2013 Data Summary
- Ray, A., A. Sepulveda, B. Hossack, D. Patla, and K. Legg. 2014. Using monitoring data to map amphibian breeding hotspots and describe wetland vulnerability in Yellowstone and Grand Teton national parks. *Park Science* 31(1):112-117. (<http://nature.nps.gov/ParkScience/>)
- See several articles from Dave Thoma and Andy Ray in the new edition of *Yellowstone Science* (<http://go.nps.gov/YellowstoneScience>)
- Check out Kristin's article in the Montana NSF EPSCOR newsletter: <http://montanaioe.org/sites/default/files/newsletter/epsconewsletter-winter2015-e.pdf>

## Greater Yellowstone Network

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Katie Kaylor • Montana State University  
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Adam Sigler • Montana State University  
(Water Quality)

Mike Tercek, PhD • Northern Rockies  
Conservation Cooperative  
(Upland Vegetation, Climate)

<http://science.nature.nps.gov/im/units/gryn/>



Safety scenario exercise.