GRAND TETON NATIONAL PARK RESEARCH NEEDS 2024

HYDROLOGY, AIR QUALITY AND GEOLOGY Broad themes of interest:

- Use of LiDAR and remote sensing to analyze geoscience and ecological processes – conduct change analysis comparing 2014 and 2022 LiDAR data.
- Evaluate effects of climate change on biotic and abiotic processes, especially related to water resources. Downscaled climate modelling and scenario planning across Snake Headwaters.
- Monitor rates of glacial loss and impact to alpine macroinvertebrate communities.
- Developing new surficial geologic and geomorphic maps.
- Monitoring, assessing, and reporting geohazards in front and backcountry.
- Investigate hydrologic and geomorphic processes in dynamic river environments.
- Study downstream impacts of reduced flood magnitude from Jackson Lake dam.
- Study impacts of water rights and flow diversions on geomorphology and ecology of river systems.

For questions about geologic and hydrologic studies, contact Simeon Caskey at 307-699-1808

ECOLOGY, VEGETATION AND SOILS

- Investigate whitebark pine seedling regeneration, demography, and their rates of blister-rust infection and mortality.
- Map and evaluate effects of tent caterpillar defoliation on shrub flowering, seed production, vigor, and mortality.
- Investigate habitat selection and use by insects, arthropods, pollinators, and mammals across intact, degraded, and restored sites.
- Describe biological soil crust composition, structure, and function across intact, degraded, and restored sites.
- Identify candidate biological soil crust species; field test techniques for their restoration and document biocrust, soil and vascular plant outcomes related to treatments.
- Investigate effects of earlier plant flowering on pollinators and/or wildlife

For questions, contact ecologist Laura Jones at 307-699-0480

FISH AND WILDLIFE (broad themes of interest**):**

- Investigate climatic influences on aquatic and terrestrial habitats.
- Evaluate effects of aquatic and terrestrial invasives on native wildlife and their habitats.
- Evaluate effects of contaminants, pathogens, and disease on fish and wildlife.
- Identify limiting factors and population dynamics of aquatic organisms.
- Gain understanding of life histories of fishes inhabiting park waters.
- Monitor and research species of concern with an emphasis on passerines and water-dependent birds (e.g., loons, trumpeter swans, harlequin ducks, and great blue herons).
- Investigate competition between osprey and bald eagles.
- Monitor and research threatened species and species of concern with an emphasis on wolverines, yellow-billed cuckoos, and pika.
- Natural soundscapes and night sky friendly lighting.
- Research the benefits of natural soundscapes/night sky friendly lighting for wildlife.

- Assess utility of non-invasive fecal sampling to estimate moose population size.
- Evaluation of automated image-based methods to count pronghorn.
- Examine changes in vegetation and snow conditions in alpine and subalpine areas of the Teton Range using remote sensing and assess how changes may impact bighorn sheep
- Examine the spatial and temporal patterns of black bears navigating human-dominated areas
- Explore non-invasive techniques to Identify bear movements and monitor bear populations within the park.
- Monitoring and managing the human-wildlife interface.

For questions about fish and wildlife, contact Kate Wilmot, Branch Manager of Fish and Wildlife, 307-739-3673.

HISTORY, HISTORIC PRESERVATION AND ARCHEOLOGY

- Conduct archeological research and survey of previously unsurveyed areas, could include backcountry survey, resulting in a technical report written to Wyoming state standards.
- Conduct a study on the history of park trails and roadways, resulting in a National Register nomination written to Wyoming state standards.
- Conduct assessments or produce architectural drawings of historic structures or cultural landscapes within the park and develop treatment recommendations.

For questions, contact Kate Birmingham, Branch Manager of Cultural Resources, 307-699-2792

MUSEUM COLLECTIONS

- Conduct an initial context study of the Grand Teton Lodge and Transportation Company's influence on the park and local tourism.
- Complete an initial context study of "imaging Grand Teton National Park" -- a history of painters, filmmakers, and artists.

For questions, contact Becca Pachlhofer, museum curator, 307-690-0049. Many of these projects are ideal for a graduate student with supervision.

SOCIAL SCIENCE

- Develop a long-term visitor use monitoring plan for the Snake River
- Research visitor information sources and efficacy for responsible recreation
- Identify and develop templates for effective science communication
- Research the effects of anthropogenic noise and natural sounds and/or night sky friendly lighting on visitor experience
- Visitor use, experience, and motivations in the John D. Rockefeller, Jr. Memorial Parkway

For questions about social science, please contact Jennifer Newton, social scientist, 307-699-3184.

All research conducted in NPS units requires a research and collecting permit approved and issued by the park(s) in which studies will be conducted. See https://irma.nps.gov/rprs/ for more information