

GRAND TETON NATIONAL PARK RESEARCH NEEDS 2023

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 an urgent and critical need for Snake River Headwater basin.
- Monitor rates of glacial loss and impact to alpine coldwater 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 rapid ramping of flow rates out of 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 307-739-3493

ECOLOGY, VEGETATION AND SOILS

- Model cheatgrass-fire cycle scenarios and test mitigations
- Use of LiDAR and remote sensing to analyze cheatgrass habitat suitability and infestation status.
- Test habitat restoration outcomes of different native seed mixes and soil preparation treatments.
- Describe biological soil crust composition, structure, and function across sagebrush habitat restoration sites, unrestored degraded pasture grass dominated sites, and healthy intact sagebrush sites.
- Identify candidate biological soil crust species; field test techniques for their restoration and document biocrust, soil and vascular plant outcomes related to treatments.
- Apply LiDAR and other remote sensing to evaluate cheatgrass habitat suitability and infestation status.
- Assess outcomes of various chemical treatments on target invasive plant species and native plant composition, germination, and abundance.
- 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
- Monitor and research threatened and endangered species and species of concern with an emphasis on grizzly bears, wolverines, yellow-billed cuckoos, pika, passerines, and water-dependent birds (e.g., loons, trumpeter swans, harlequin ducks, and great blue herons).
- Monitoring and managing the human-wildlife interface.
- Natural soundscapes and night sky friendly lighting.

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

- Evaluate spatio-temporal ecological questions associated with coexistence among wolves, coyotes, and red fox.
- Identify limiting factors and population dynamics of aquatic organisms
- Gain understanding of life histories of fishes inhabiting park waters
- Estimate nutritional carrying capacity for bighorn sheep in the Teton Range using remote sensing and vegetation sampling
- Assess utility of non-invasive fecal sampling to estimate moose population size
- 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 and monitor bear movements within the park
- Research the benefits of natural soundscapes/night sky friendly lighting for wildlife.

HISTORY, HISTORIC PRESERVATION AND ARCHEOLOGY

- Conduct archeological research and survey of previously unsurveyed areas, could include high altitude sites or ice patch archeology, resulting in a technical report written to Wyoming state standards
- Conduct archeological site condition assessments and fire cracked rock feature research in the Jackson Lake Archeological District resulting in site database updates and 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 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 preliminary research on mountain climbing history in GTNP
- Complete an initial context study of “imaging Grand Teton National Park” -- a history of painters, filmmakers, and artists

For questions, contact Bridgette Guild, 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
- Research cycling use patterns, particularly on the multi-use pathway system
- Identify and develop templates for effective science communication
- Research the effects of anthropogenic noise and natural sounds and/or dark skies on visitor experience

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