



# Research Needs, 2010

## NATURAL HISTORY

### *Vegetation, Soils, and GIS*

Investigation of relict wetlands and historic diversion of natural water flows in the Kelly Hayfields/Mormon Row area (Contact: John Moeny, restoration biologist, 307-739-3486)

Determine the benefit of using cover crops in ecological restoration of former hayfield sites (Contact: John Moeny)

Predicting the spread of spread of cheatgrass in relation to climate change on a local scale in Grand Teton National Park (Contact: Kelly McCloskey, ecologist, 307-739-3678)

Efficacy of yellow toadflax treatment or alternative methods including combinations of herbicide and revegetation on montane meadows (Contact: Kelly McCloskey)

Do human impacts have lasting effects on soils and revegetation potential at recreation sites in the sub-alpine zone of Grand Teton National Park? (Contact: Kelly McCloskey)

Evaluate impacts of current insect and blister rust infestations on birds which use whitebark pine stands differently than they do other sub-alpine forests (Contact: Sue Wolff, wildlife biologist, 307-739-3464)

Effects of atmospheric deposition on alpine communities (plants, diatoms, water chemistry) (Contact: Susan O'Ney, hydrologist, 307-739-3666)

Process and analyze LiDAR data for applications such as creation of elevation and topographic surface maps and investigating vegetation and bare earth data to assess canopy structure, density, and habitat identification (Contact: Kathy Mellander, GIS specialist, 307-739-3493)

Analyze QuickBird imagery for studying spectral and spatial effects of ortho-rectification on shadow areas in steep slopes, delineating surface areas of glaciers and permanent ice/snow fields, and characterizing vegetative status in subalpine and alpine areas, and (Contact: Kathy Mellander)



### *Wildlife*

Effects of climate change on pika (*Ochotona princeps*) occurrence and distribution in Grand Teton National Park. (Contact: Sue Wolff)

Seasonal movements and habitat use of sage grouse in Grand Teton NP (Contact: Steve Cain, 307-739-3485 or Sue Wolff, 307-739-3464)

Occurrence of lynx in and around Grand Teton NP (Contact: Steve Cain)

Reproductive ecology of Teton Range wolverine (Contact: Steve Cain)

Ecological and/or human factors associated with long-term decline of nesting great blue herons in Grand Teton NP (Contact: wildlife biologists Steve Cain or Sue Wolff)

Distribution and population trend of beaver in Grand Teton NP (Contact: Steve Cain)

Distribution and genetics of Northern leatherside (*Lepidomeda copei*) in Grand Teton NP (Contact: hydrologist Susan O'Ney, 307-739-3666)

Strategies for minimizing/eliminating exotic aquatic species (brook trout, rainbow trout, New Zealand mudsnails) in GTNP (Contact: Susan O'Ney)

Determine thermal thresholds for exotic aquarium fish and snails in Kelly Warm Springs and their potential for spread (Contact: Susan O'Ney)

Investigate fish entrainment and water rights in selected irrigation ditches within the park (Contact: Susan O'Ney)

Identify tributaries to Jackson Lake important for cutthroat trout recruitment (Contact: Susan O'Ney)

Investigate potential control mechanisms for *Didymosphenia geminata* (commonly known as "rock snot") (Contact: Susan O'Ney)



## *Hydrology, Air Quality, and Geology*



Assess the alluvial valley aquifer in Grand Teton NP, including an evaluation of declining water levels in Christian Pond and Pilgrim Creek (Contact: Susan O'Ney, 307-739-3666)

Effects of atmospheric deposition on high-elevation aquatic communities (diatoms, water chemistry) (Contact: Susan O'Ney)

Mapping landslide hazards (Contact: GIS specialist Kathy Mellander, 307-739-34893)

Develop protocols for mapping and spatial analysis using remote sensing (multi-spectral satellite imagery, LiDAR) to analyze change in the hydrologic cycle and vegetative resources of Grand Teton NP over time (contact: Kathryn Mellander)

Estimate the annual extent of snow-covered area using remote sensing/repeat images to establish the direction and rate of change (Contact: Susan O'Ney)

How do changes in snow pack, loss of alpine glaciers, and forest disturbances such as fire or insect outbreaks translate into changes in stream and river discharge? (Contact: Susan O'Ney)

Determine timing and pattern of snowmelt runoff in selected watersheds and relate changes in chemical concentrations as an indicator of changes in climate, soil processes, and deposition chemistry (Contact: Susan O'Ney)

Determine whether stored pollutants (POPs, mercury, etc.) exist in glacial ice and/or snowfields and assess the implications related to climate change (Contact: Susan O'Ney)

Monitor the changes in water temperature and flow of streams draining park glaciers to determine the effects of loss of glacier mass (Contact: Susan O’Ney)

Design a parkwide groundwater monitoring program (stage height) to determine changes due to development or climate change (Contact: Susan O’Ney)

Ecological function/condition of the Potholes region of Grand Teton NP (Contact: Susan O’Ney)

## CULTURAL RESOURCES AND HISTORY

Research and determine eligibility of the Elk Ranch property for listing on the National Register of Historic Places (Contact: Katherine Longfield, 307-739-3671)\*

Investigate the history of the David T. Vernon Collection of Indian Arts and Artifacts and what became of 8500 objects that are no longer part of the collection (Contact: Alice Hart, 307-739-3494)

Profile individual geologists who have played a key role in understanding Jackson Hole and Grand Teton NP (e.g., Ferdinand Hayden, Fritiof Fryxell, and David Love) (Contact: Alice Hart)\*

Complete a history of the Civilian Conservation Corps, including road, trail, building construction and clean-up work conducted around Jackson Lake (Contact: Katherine Longfield.)

Evaluate the cultural landscape of the former 4 Lazy F Ranch in Grand Teton NP (Contact: Katherine Longfield)\*

Complete an initial context study of “imaging Grand Teton National Park,” a history of painters, film makers, and artists (Contact: Katherine Longfield )\*

Create a barn typology study - builders, styles, condition, era, function (Contact: Katherine Longfield )\*

Complete a history of the former Jackson Hole Wildlife Park (Contact: Katherine Longfield)\*

Survey and analyze Mission 66 era construction in GTNP (Contact: Katherine Longfield)\*

Complete a history of backcountry trails in GTNP (Contact: Katherine Longfield)\*



## SOCIOLOGICAL RESEARCH

Identify visitor perceptions and attitudes about the impacts of large and small aircraft overflights in Grand Teton National Park (Contact: Chief of Science & Resources Sue Consolo Murphy, 307 739-3481)\*

Investigate visitor expectations related to recreational experiences on the Snake River in Grand Teton NP (Contact: Sue Consolo Murphy)\*

\*Projects may be especially suitable for student internships



# University of Wyoming- NPS Research Center

