# USGS NSF Internship Opportunity

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| **Point of Contact Name**: | Tabitha Graves |
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| **USGS Center:** | Northern Rocky Mountain Science Center |
| **Project Title:** | Evaluating best practices for genetic sampling of bear populations |
| **Summary:** | Work with spatial and behavioral wildlife ecologists to investigate patterns in the selection, spatial distribution, and temporal use of marking sites among/between bear species and sexes. Classify and quantify bear behavior types and sequences videoed at rub sites to develop a more nuanced understanding of sex and age-class differences. Field data primarily along the trail system of Glacier National Park, Montana. |
| **Project Hypothesis or Objectives:** | Genetic analysis of hair sampled at grizzly and black bear rub sites provides an effective way to assess population status. Developing a better understanding of bear marking behavior will make this sampling method more powerful. Using video taken at rub sites and spatial arrays of repeated detections of individual bears acquired at a landscape scale over 5 years, the student will explore which bears rub, why they rub, and where and when they do it. Specific areas to be addressed include; 1) the function of rubbing and other marking displays (e.g. mate attraction, dominance assertion, competitor assessment), 2) evidence of infanticide avoidance, and 3) selection and spatial distribution of rub objects. Patterns illuminated by these analyses will be used to design more efficient population sampling schemes and improve interpretation of the data acquired. |
| **Duration:** | Up to 12 months |
| **Internship Location:** | West Glacier, MT |
| **Field(s) of Study:** | Geography and Life Science |

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| **Applicable NSF Division:** | Earth Sciences (GIS), DEB Environmental Biology, Behavioral Sciences, Mathematical Sciences |
| **Intern Type Preference:** | NSF Graduate Research Fellow (GRF) |
| **Keywords:** | animal behavior, bear rubs, behavioral science, black bears, Glacier National Park, grizzly bears, marking behavior, Montana, population monitoring, rub trees, scent-marking, spatial analyses |
| **Expected Outcome:** | The project will advance our understanding of bear rubbing behavior that will be useful in improving bear population monitoring sampling designs. The USGS, as well as other land and wildlife management agencies, will benefit by improving interpretation of existing data on grizzly and black bear populations in the intermountain west and by being better positioned to design effective sampling strategies in the future. The intern will benefit from participation in an important applied natural resource management analysis, exposure to a range of USGS science, and advances in spatial analysis skill sets. |
| **Special skills/training Required:** | Intern should have intermediate skills in the statistical environment R and at least basic skills with GIS. We will teach the student more advanced skills in R. A background in animal behavior and ecology would also be helpful. To observe bear rubs in the field, intern should be able to hike up to 8 miles/day with a 20 pound pack under a variety of weather conditions. Driver's license required. |
| **Duties/Responsibilities:** | The intern will ideally be located at a USGS field station located in Glacier National Park. They will work with statistical software, GIS, a large relational database, and spatial and behavioral ecologists to develop a full analysis plan, learn techniques to classify animal behavior, and increase their spatial analysis skills. |

**Internal Information - Not to be posted:**

**Center Director Name:** Claudia Regan
**USGS Responsibilities:** Equipment, Facilities, Mentoring, On-boarding, Background Check, Volunteer Agreement Management
**Preliminary Approval:** This opportunity has my Center's approval
**I already have a student in mind:**

**Comments:**