

## **Project Summary**

### **Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Factors Influencing Harlequin Duck Survival and Recruitment in Glacier National Park

**Discipline:** Natural  
**Type of Project:** Research  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** University of Montana  
**Effective Dates:** March 15, 2011 - December 31, 2013  
**Funding Amount:** \$10,000

**Investigators and Agency Representative:**

NPS Contact: Mark J. Biel, Natural Resources Program Manager, Glacier National Park, PO Box 128, West Glacier, MT 59936, Phone: 406.888.7919, Fax: 406.888.7990, Email: mark\_biel@nps.gov

Investigator: Creagh Breuner, Associate Professor, Wildlife Biology, Organismal Biology and Ecology, The University of Montana, Missoula, MT 59812, Phone: 406-243-5585, Email: creagh.breuner@umontana.edu

**Project Abstract:** The objective of this project is to study life strategies of Harlequin Ducks in Glacier National Park over a two-year period by examining a range of possible factors influencing survival and recruitment. Through the use of radio-telemetry, we will greatly expand our knowledge of where Harlequins nest, the factors affecting their nest success, and the factors affecting chick survival. Harlequin Ducks are listed as a species of concern in Montana, where they are at high risk of extirpation due to their very limited numbers, limited habitat, overhunting (outside the state), disturbance, and habitat loss or alteration. The impacts of climate change and consequent changes in spring runoff are also of serious concern for this species (Robertson and Goudie 1999).

More than 25% of all Harlequin Duck chicks produced in Montana are raised along the 9.7-mile stretch of McDonald Creek from Lake McDonald to Logan Creek, in Glacier NP, making Upper McDonald Creek (UMC) one of the most significant Harlequin breeding streams in Montana (Montana Natural Heritage Program 2010). All female Harlequin Ducks born on UMC subsequently return to nest there once they reach breeding age. Although systematic stream surveys have been conducted along UMC since 1991, only one Harlequin nest has ever been found in the park due to the secretive behavior and cryptic coloring of these birds. As a result, little is known about their nesting and breeding behavior in the park, nor about which factors may affect those behaviors and the overall health of the breeding population. Attaching radio transmitters to females of breeding age will allow us to locate nests and monitor the factors influencing nest productivity and brood survival.

The UMC is a prime study area to investigate some of the factors that may influence nesting and brood-rearing success of Harlequin Ducks. The historic Going-to-the-Sun Road (GTSR) parallels UMC and provides relatively good access to many parts of the creek. While some parts of UMC are directly adjacent to the GTSR, other parts are buffered from the road due to distance, height, dense vegetation, or water, which will allow us to study areas both in proximity to and relatively remote from centers of human activity. Currently, GTSR is undergoing major rehabilitation and visitor numbers have increased steadily over the past years, reaching a record high in 2010. Harlequin Ducks are known to be sensitive to human disturbance (Robertson and Goudie 1999).

This project will be designed to answer the following questions:

- a) What are the habitat characteristics in the vicinity of Harlequin nests at Glacier NP?
- b) Do Harlequins tend to nest in areas further away or closer to centers of human activity?
- c) What constitutes prime Harlequin Duck foraging habitat?
- d) Are Harlequins displaced from prime foraging areas due to human activity?
- e) Does proximity to human activity affect Harlequin stress levels?
- f) Do all birds that arrive on UMC in the spring stay to breed there, or are some ducks using the UMC as a staging area before they disperse to their natal grounds?

The Harlequin Duck is one of the top species sought out by park visitors with an interest in birds, because of their striking beauty and rarity. The information gathered through this project will be used to help maintain and perhaps increase the population of this species in Glacier NP and Montana.

**Outcomes with Completion Dates:** December 31, 2011 and December 31, 2012-Annual reports and December 31, 2012 - Final report

**Keywords:** Glacier National Park, University of Montana, Harlequin Ducks, survival and recruitment, species of concern, radio-telemetry