

Integration of habitat modeling, stress physiology and stream flow to explain breeding success in the harlequin duck (*Histrionicus histrionicus*)

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Photo: John Ashley
Harlequin duck pair stretching

Harlequin ducks (*Histrionicus histrionicus*) have declined across their range in North America. Harlequins are small sea ducks that spend most of their lives in coastal waters. During the breeding season they migrate inland to mate and raise their young along fast-moving mountain streams. Harlequins are segregated into two distinct populations. There is an eastern population, which winters from Maryland to Greenland (Vickery 1988; Scott 1996), and a much larger population exists on North America's west coast, from Northern California to Alaska (Isleib 1973; Hare 1995). The western population is considered to be stable, but local populations, in the state of Colorado and in watersheds of Idaho and Montana (Robertson and Goudie 1999), have gone extinct. Montana has listed harlequins as species of special concern (Montana FWP 2012).

Our study site is located on Upper McDonald Creek in Glacier National Park, Montana. This site is considered an important breeding stream comprising 25% of known harlequin duck

broods produced in Montana, and has the highest density of breeding harlequins in the lower 48 states (Reichel 1996).



Photo: John Ashley
Harlequin duck brood being released after capture

The objective of this research is to better understand the critical factors that contribute to reproductive success. To achieve this objective we are modeling habitat selection by means of radio telemetry and survey data, quantifying stress physiology from plasma and feather samples, and modeling the relationship between historical stream flows on brood abundances.

In 2011 and 2012 field seasons we captured and sampled a total of 90 adult and juvenile harlequin ducks. In this same time we discovered 4 active harlequin duck nests belonging to radio tagged individuals. All radio tagged harlequins marked in 2011 returned to their same breeding territories in 2012. We have observed 4 of our radioed individuals on the wintering ground off of the coast of Washington in the Puget Sound around Bainbridge and Whidbey islands. We have additionally observed novel habitat use by roosting harlequin ducks on Lake McDonald during the breeding season.

This work is necessary to advance our understanding of harlequin biology to lead to improved conservation of this important and charismatic species. This research and analysis will continue through 2014. The 3rd and final field season will start in April of 2013. Thesis defense is scheduled for spring 2014.

References

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