

Harlequin Duck Population Dynamics in Prince William Sound: Measuring Recovery

2008 Progress Report (Project: 080759)

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In March 2008 we completed the 8th year of monitoring surveys since the inception of winter surveys in 1997. These surveys measure recovery of harlequin ducks by comparing changes in demographic parameters within and between oiled and unoiled sites in Prince William Sound. Surveys were expanded in 2007 to compare the potential disparity of harlequin duck densities between oiled and unoiled regions over time and better estimate the number of ducks we would expect to observe in oiled areas. The surveys were expanded again in 2008 to collect data to address the need for estimates of within-year transect variability and determine how effectively we can analyze data at smaller spatial scales.

In addition to completing surveys to compare density and population age and sex structure between oiled and unoiled areas of PWS, we resurveyed 20 oiled and 20 unoiled transects originally surveyed in March of 1972 and 1973. These 1972 and 1973 surveys are the only pre-spill winter data available on population abundance and we now have two years of post-spill data for comparison with the pre-spill data.

We have begun preliminary analytical work to 1) compare changes in density between treatments (oiled and unoiled survey areas) and population structure (immature males, adult males, and females) from 1997 through 2008; 2) compare annual changes in density and population structure *within* oiled and unoiled treatments and 3) Compare changes in densities of harlequin ducks from winter surveys of 1972 and 1973 with winter surveys from 2007 and 2008 (based on oiling history).

In April 2008 we began a pilot study to 1) develop a sampling protocol to improve estimates of within year transect variability for oiled and unoiled treatments; 2) determine the spatial scales suitable for trend and composition estimates relevant to oil history; and 3) develop a new survey protocol to improve our ability to estimate changes in the number of harlequin ducks at smaller spatial scales. We completed from 3-5 replicate surveys for 5 transects in oiled areas of WPWS and on Montague Island. We need to continue with this effort in 2009 before we can complete our objectives.

All data has been entered and we have conducted quality control review and are beginning preliminary analysis.

Preliminary evaluation of survey data does not does not indicate any marked differences from prior year values for changes in densities or population structure for oiled or unoiled areas.

From cursory review, our data indicates a low likelihood that populations have behaved differently in oiled and unoiled areas since 1972-1973 and it also indicates that populations have likely been stable or increasing slightly for both oiled and unoiled areas since 1972-1973. Much more in-depth analysis still needs to be conducted.

With the above survey obligations and the potential for pre-migratory movements of harlequin ducks in late-spring, we had a narrow window in which to conduct replicate surveys. This required us to conduct the replicate surveys in early to mid-April. Poor weather reduced this window. Primarily on Montague Island, movements of harlequin ducks, presumably related to pre-herring spawn activity, forced us to discard some replicate surveys. These will have to be repeated in 2009 at an earlier date.

We are continuing to analyze data and designing the 2009 survey protocols to allow us to complete the replicate sampling.