Harlequin Duck surveys
in western Montana: 1992

A Report to:

USDA Forest Service
Kootenai National Forest
506 U.S. Highway 2 West
Libby, MT  59923

and

Flathead National Forest
1935 Third Avenue East
Kalispell, MT  59901

Submitted by:

James D. Reichel
and
David L. Genter

March 1993

Montana Natural Heritage Program
1515 East Sixth Avenue
Helena, MT 59620
Call #: S
598.41
N11HDS
1993
1
Barcode:
Montana State Library
3 0864 1004 7135 1
This document should be cited as follows:

# TABLE OF CONTENTS

LIST OF TABLES .......................................................... iv  
LIST OF FIGURES .......................................................... v  
ACKNOWLEDGEMENTS ....................................................... vi  
INTRODUCTION ............................................................ 1  
METHODS AND MATERIALS ................................................ 3  
RESULTS AND DISCUSSION ................................................ 4  
  Surveys ................................................................. 4  
    Flathead National Forest ............................................ 4  
    Kootenai National Forest ........................................... 5  
    Lolo National Forest ............................................... 5  
    Glacier National Park ............................................. 6  
    Breeding Chronology and Effects on Surveying .................. 6  
  Reproduction .......................................................... 12  
  Capture and Marking .................................................. 12  
MANAGEMENT RECOMMENDATIONS AND RESEARCH NEEDS ............... 14  
LITERATURE CITED ...................................................... 17  
APPENDICES .............................................................. 20  
  Appendix A. Data forms .............................................. 20  
  Appendix B. Element Occurrence Records from 1992  
    surveys ................................................................ 23  
  Appendix C. Maps of 1992 Element Occurrence Records ........ 42  
  Appendix D. List of Harlequin Ducks marked in 1992 .......... 53  
    Marten Creek, Kootenai National Forest ......................... 53  
    Vermillion River, Kootenai National Forest .................... 53  
    Trail Creek, Flathead National Forest .......................... 54  
    Spotted Bear River, Flathead National Forest ................. 54  
    Glacier National Park ............................................. 55  
  Appendix E. Maps of locations of Harlequin Ducks  
    marked in 1992 ...................................................... 57
TABLES

Table 1. Streams surveyed and Harlequin Ducks observed in 1992 ........................................ 8

Table 2. Miscellaneous reports of Harlequin Ducks during 1992 .................................................. 11

Table 3. Summary of harlequin ducks marked in 1992 ............................................................... 13
FIGURES

<table>
<thead>
<tr>
<th>Harlequin Duck Survey Form.</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harlequin Duck Banding Form.</td>
<td>22</td>
</tr>
<tr>
<td>Upper McDonald Creek (Harlequin Duck EO-002)</td>
<td>43</td>
</tr>
<tr>
<td>Marten Creek (Harlequin Duck EO-006)</td>
<td>44</td>
</tr>
<tr>
<td>Vermilion River (Harlequin Duck EO-008)</td>
<td>45</td>
</tr>
<tr>
<td>Sullivan Creek (Harlequin Duck EO-017)</td>
<td>46</td>
</tr>
<tr>
<td>Middle Fork Flathead River (Harlequin Duck EO-018)</td>
<td>47</td>
</tr>
<tr>
<td>Trail Creek (Harlequin Duck EO-019)</td>
<td>48</td>
</tr>
<tr>
<td>North Fork Blackfoot River (Harlequin Duck EO-022)</td>
<td>49</td>
</tr>
<tr>
<td>Little Salmon Creek (Harlequin Duck EO-023)</td>
<td>50</td>
</tr>
<tr>
<td>White River (Harlequin Duck EO-024)</td>
<td>51</td>
</tr>
<tr>
<td>Spotted Bear River (Harlequin Duck EO-029)</td>
<td>52</td>
</tr>
<tr>
<td>Marten Creek Harlequin Duck marking sites, 1992.</td>
<td>58</td>
</tr>
<tr>
<td>Marten Creek Harlequin Duck marking sites, 1992.</td>
<td>59</td>
</tr>
<tr>
<td>Vermilion River Harlequin Duck marking sites, 1992.</td>
<td>60</td>
</tr>
<tr>
<td>Trail Creek Harlequin Duck marking sites, 1992.</td>
<td>61</td>
</tr>
<tr>
<td>Trail Creek Harlequin Duck marking sites, 1992.</td>
<td>62</td>
</tr>
<tr>
<td>Spotted Bear River Harlequin Duck marking sites, 1992.</td>
<td>63</td>
</tr>
<tr>
<td>McDonald Creek Harlequin Duck marking sites, 1992.</td>
<td>64</td>
</tr>
<tr>
<td>McDonald Creek Harlequin Duck marking sites, 1992.</td>
<td>65</td>
</tr>
<tr>
<td>McDonald Creek Harlequin Duck marking sites, 1992.</td>
<td>66</td>
</tr>
<tr>
<td>Mineral Creek Harlequin Duck marking sites, 1992.</td>
<td>67</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

We thank Bob Summerfield and Nancy Warren for their help throughout the study. We were assisted with field work by Eric Atkinson, Stan Beckstrom, and Chad Castren. Additional help, location of possible trapping sites, and other logistical support was provided by J. Ashley, D. Boots, J. Davies, S. Gniadek, C.E. Hidy, C. Jones, F.B. Sanchez, and other Forest Service and Park Service personnel. C. Jones and C. Craig assisted with element occurrence and map preparation. Financial support for the project came from the Kootenai and Flathead National Forests (U.S. Forest Service, Northern Region) and the Montana Natural Heritage Program (The Nature Conservancy).
INTRODUCTION

The harlequin duck (*Histrionicus histrionicus*) is a small sea duck, found inland only during the breeding season. The male is strikingly colored with black and white spots and slashes, and chestnut sides on a deep cobalt blue background. The female is dull brown with three white spots on her face. Harlequins breed in western North America from Alaska and the Yukon south through western Montana to California; in eastern North America they breed from Baffin Island south to eastern Quebec and Labrador (Goudie 1993). In the Palaearctic they breed in Iceland, Greenland and Siberia (A.O.U. 1983). Approximately 110 pairs of harlequins currently breed in Montana (Genter 1993), with most located in the following areas: 1) tributaries of the lower Clark Fork River; 2) tributaries of the North, Middle, and South Forks of the Flathead River; 3) streams coming off the east front of the Rocky Mountains; and 4) the Boulder River (Miller 1988, 1989, Kerr 1989, Carlson 1990, Fairman and Miller 1990, Diamond and Finnegan 1992).

During the breeding season harlequins are found along fast mountain streams (Bengston 1966). In many areas harlequins use streams with dense timber or shrubs on the banks (Cassirer and Groves 1990), but they are also found in relatively open streams along the east slopes of the Rocky Mountains, Montana (Markum and Genter 1990, Diamond and Finnegan 1992) and the Arctic tundra (Bengston 1972). In Idaho, 90% of observations occurred near old growth or mature timber stands (Cassirer and Groves 1990). Mid-
stream rocks, logs, islands, or stream-side gravel bars serve as safe loafing sites are important habitat components.

Most of the ducks arrive on their inland breeding areas in mid-April to early-May; unmated males typically arrive before pairs (Kuchel 1977). The males return to the coast shortly after the females begin incubation; most are gone by early July (Kuchel 1977). The females and young remain on the streams until August or early September. This chronology is influenced by elevation and the timing of spring runoff and may vary up to several weeks between years.

The U.S. Forest Service, Region 1, lists the harlequin duck as Sensitive (Reel at al. 1989). The species is listed as a Species of Special Concern by the Montana (Genter 1992) and Idaho (Moseley and Groves 1990) Natural Heritage Programs. The eastern North American population is listed as endangered in Canada (Goudie 1993); the western population is listed under Category 2 as a candidate for listing under the Endangered Species Act by the U.S. Fish and Wildlife Service (U.S. Department of Interior 1991).

The Montana Natural Heritage Program began surveying harlequin ducks in 1988. The survey data gave rise to questions involving site fidelity, productivity and mortality. Individual marking of birds began to a limited extent in 1991. Long term goals are: 1) developing a baseline status report of current and historic harlequin populations in Montana; 2) gather information on site fidelity, reproduction and mortality to allow estimations
of what constitute viable harlequin populations; 3) develop surveying protocols for actual and potential harlequin streams; 4) develop management guidelines for maintaining and restoring harlequin populations and habitat. Goals for 1992 included: 1) surveying additional streams for presence and status of harlequins; 2) gathering productivity data on some primary harlequin streams; and 3) marking as many individuals as possible on selected streams for long-term monitoring.

METHODS AND MATERIALS
Harlequin ducks were surveyed on parts of the Kootenai, Flathead and Lolo National Forests during May-August 1992. Most surveys were conducted by walking the stream channel (when possible) or stream bank. In most cases the surveyor walked upstream, giving more time to observe the bird before it moved out of sight. Some large streams on the Flathead National Forest were surveyed by kayak or raft. Dates, locations, km surveyed, and general characteristics of the stream reaches surveyed were recorded; any harlequins sighted were noted with location, numbers, ages, and sex of birds present. For several streams in the Flathead and Clark Fork drainages, we attempted to capture and mark all birds seen, when a licensed, qualified birdbander was present on the survey. Captured birds were identified to sex and age, weighed, measured (wing and tail), marked, and released. Except in Glacier National Park, all birds were marked with numbered USFWS aluminum leg bands and colored nasal discs, individually.
recognizable by shape and color combinations. The Park felt the nasal discs would be aesthetically unacceptable to Park visitors. Birds in Glacier National Park were banded with USFWS bands and a unique combination of 3 plastic, colored leg bands.

RESULTS AND DISCUSSION

Surveys

Flathead National Forest. Pair surveys were conducted along 200 km of 12 streams during May-June 1992 (Table 1). A minimum of 13 harlequins (5 males, 8 females) were seen on 3 streams (Table 1, Appendix B & C). These included the North Fork of the Flathead River (1♂, 2♀), Sullivan Creek (2♀), and Trail Creek (4 pairs); additionally we had reports of harlequins from the Middle Fork of the Flathead River (1♂ and 1 pair; H. Rivera) and Harrison Creek (1♂; J. Graham) (Table 2).

Brood surveys were conducted along 301 km of 22 streams during July-August 1992 (Table 1). A minimum of 43 different harlequin ducks were observed on 6 streams (Table 1, Appendix B & C). These included: 1) Little Salmon Creek (2♀, 2 brood w/ 3 & 5 young), 2) South Fork of the Flathead River (4♀), 3) Spotted Bear River (1♀, 2 broods of 3 & 4 young), 4) Sullivan Creek (2 birds, either adult ♀, or fledged young), 5) Trail Creek (2♀, 2 broods of 4 & 4 young), and 6) White River (3♀, 3 broods of 1, 2, & 3 young). Additionally S. Sigler reported birds on the Middle Fork of the Flathead River (3♀, 2 broods of 5 & 4).

No harlequins were observed on Bunker Creek, Mid Creek, Big
Creek and Wounded Buck Creek where they have been observed in at least one of the past five years.

**Kootenai National Forest.** Pair surveys were conducted along 36 km of 3 streams during May-June 1992 (Table 1). A minimum of 8 harlequins (5 males, 3 females) were seen on 2 streams (Appendix B & C). These included the Vermillion River (1♂, 1♀) and Marten Creek (2 pairs plus 2♀).

Brood surveys were conducted along 41 km of 5 streams during late July - August 1992 (Table 1). A minimum of 18 different harlequin ducks were observed on 1 stream (Table 1, Appendix B & C). Marten Creek had 5♀ present with 4 broods (4,4,4,1).

No harlequins were observed on Rock Creek, Elk Creek and Swamp Creek where they have been observed in at least one of the past five years.

**Lolo National Forest.** Brood surveys were conducted along 42 km of 3 streams during August 1992 (Table 1). Three different harlequin ducks were observed on 1 stream (Table 1, Appendix B & C). The North Fork of the Blackfoot River had 3 juveniles present. Additionally an angler we talked to on the bay at the mouth of Marten Creek (Kootenai NF), reported that he had seen a female with a small brood in July on Graves Creek; he also stated he had seen harlequins on Deep Creek in previous years, but not in 1992. He was able to tell harlequins from other ducks present at the time (mallards and common mergansers). However, our survey and past surveys on Graves Creek have failed to find harlequins (Miller 1989, Fairman and Miller 1990). No harlequins
were observed during a survey of Trout Creek where they have been observed in at least one of the past five years.

**Glacier National Park.** Brood surveys were conducted along 24 km of the McDonald Creek drainage on 10-11 August 1992 and along 16 km again on 2 September 1992 (Table 1). A minimum of 50 different harlequin ducks (129; 13-14 broods of 1, 1, 2, 2, 3, 3, 3, 4, 4, 4, 7, and a group of 8 young with two size classes present) were observed on McDonald Creek and an additional 3 (19 with 2 young) on Mineral Creek (Table 1, Appendix B & C). Many other surveys were conducted throughout the season by Glacier National Park personnel (Ashley 1992). These surveys found considerable mixing of broods, both before and after marking on 10-11 August.

**Breeding Chronology and Effects on Surveying.** Breeding was very early this year, probably due to very low flows during spring runoff. As a result, most females apparently began egg laying and incubation several weeks early; males had left by the second pair survey of Marten Creek on 1 June. The last male was seen on McDonald Creek on 23 June 1992 about 10 days earlier than reported in 1973-75 (Kuchel 1977, Ashley 1992). All young were fledged or nearly flying by 4 August on Marten Creek and 12 August on Trail Creek. Some females and young left Marten Creek by 7 August. If other streams surveyed were more advanced chronologically, birds might have already left for the coast by the time the streams were surveyed for broods. However, most females and young were still present on 11 August at McDonald
Creek in Glacier National Park, and over 50% still remained on 2 September (Table 1). Surveys on Red Meadow, Rock and Swamp creeks were most likely to have been affected, since many reaches had extremely low flows or were intermittently dry by early August.
Table 1. Streams surveyed and Harlequin Ducks observed in 1992.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Date</th>
<th>kms</th>
<th>M</th>
<th>F</th>
<th>J</th>
<th>U</th>
<th>Pr</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flathead National Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babcock Creek</td>
<td>16 Jul</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bartlett Creek</td>
<td>19 Jul</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big Creek</td>
<td>15 May</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 Jun</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14 Aug</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big Salmon Creek</td>
<td>22-23 Jul</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bunker Creek</td>
<td>22 Jun</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal Creek</td>
<td>13 Jun</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 Aug</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danaher Creek</td>
<td>17 Jul</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doris Creek</td>
<td>6 Aug</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glacier Creek</td>
<td>5 Aug</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gordon Creek</td>
<td>18 Jul</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little Salmon Creek</td>
<td>23-24 Jul</td>
<td>13</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td>2(3,5)</td>
<td></td>
</tr>
<tr>
<td>Mid Creek</td>
<td>23 Jun</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Fork Flathead River</td>
<td>30-31 Jul</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Fork Flathead River</td>
<td>14 May</td>
<td>48</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quintonkon Creek</td>
<td>26 Jun</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Meadow Creek</td>
<td>13 Aug</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Fork Flathead River</td>
<td>23 Jun</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27-26 Jul</td>
<td>64</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. Fork White River</td>
<td>20 Jul</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spotted Bear River</td>
<td>24 Jun</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 Aug</td>
<td>19</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
<td>2(3,4)</td>
<td></td>
</tr>
<tr>
<td>Sullivan Creek</td>
<td>25 Jun</td>
<td>13</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Swan River</td>
<td>4-5 Aug</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trail Creek</td>
<td>14 May</td>
<td>19</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9-11 Jun</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 Aug</td>
<td>21</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
<td>2(4,4)</td>
<td></td>
</tr>
</tbody>
</table>

Additional marking attempts were also made 13 Aug
Table 1. continued.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Date</th>
<th>kms</th>
<th>M</th>
<th>F</th>
<th>J</th>
<th>U</th>
<th>Pr</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flathead National Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Twin Creek</td>
<td>23 Jun</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheeler Creek</td>
<td>9 Aug</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White River</td>
<td>19-21 Jul</td>
<td>14</td>
<td>3</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>3(1,2,3)</td>
</tr>
<tr>
<td>Wounded Buck Creek</td>
<td>5 Jun</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 Aug</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Youngs Creek</td>
<td>15-17 Jul</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kootenai National Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marten Creek</td>
<td>12 May</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1 Jun</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Aug</td>
<td>9</td>
<td>5</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td>4(4,4,4,1)</td>
</tr>
<tr>
<td>additional marking attempts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>were also made 5-7 Aug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Creek</td>
<td>4 Aug</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Aug</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Aug</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamp Creek</td>
<td>13 May</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 Aug</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermillion River</td>
<td>1-2 Jun</td>
<td>13</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6 Aug</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wigwam River</td>
<td>8 Jul</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lolo National Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graves Creek</td>
<td>6 Aug</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Fork Blackfoot River</td>
<td>21-22 Aug</td>
<td>26</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>1(2 or 3)</td>
</tr>
<tr>
<td>Trout Creek</td>
<td>7 Aug</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1. continued.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Date</th>
<th>kms</th>
<th>M</th>
<th>F</th>
<th>J</th>
<th>U</th>
<th>Pr</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glacier National Park</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDonald Creek</td>
<td>10-11 Aug</td>
<td>23</td>
<td>10</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broods:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10(3,2,3,7,4,1,2,1,3 &amp; group of 8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Sep</td>
<td>16</td>
<td></td>
<td>5</td>
<td>20</td>
<td>2</td>
<td></td>
<td></td>
<td>2+</td>
</tr>
<tr>
<td>New Broods:</td>
<td>2(4,4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mineral Creek</td>
<td>11 Aug</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>1(2)</td>
</tr>
<tr>
<td>Ole Creek</td>
<td>12 Aug</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10
Table 2. Miscellaneous reports of Harlequin Ducks during 1992.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Date</th>
<th>M</th>
<th>F</th>
<th>J</th>
<th>U</th>
<th>Pr</th>
<th>Br</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flathead National Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harrison Creek T24N R14W S8</td>
<td>27 May</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Graham</td>
<td>3 May</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Fork Flathead River T30N R16W S34 NW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Rivera</td>
<td>31 May</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Rivera</td>
<td>10 July</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>1(4)</td>
</tr>
<tr>
<td>S. Sigler</td>
<td>16 July</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>1(5)</td>
</tr>
<tr>
<td>Lolo National Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graves Creek T23N R29W S36</td>
<td>July</td>
<td>1</td>
<td>2+</td>
<td></td>
<td></td>
<td></td>
<td>1(2+)</td>
</tr>
</tbody>
</table>
Reproduction

Harlequins were present this year on at least 12 streams in the study area and adult females or broods were seen on 11 of those streams. A minimum of 42 adult females were present. Of 42 potential broods, a minimum of 31 were produced for a 74% success rate of broods per adult female. Mid-late August brood size averaged 3.27 (n=30). Most broods were seen in Class III or fledged stages of development (Bellrose 1976:27), and we made no adjustment for age of broods in our calculation of mean brood size. Success rates per adult female are biased by having incomplete early pair surveys for comparison on some streams, resulting in high recorded success rates. However, this may have been offset by some broods fledging and leaving the area prior to brood survey completion on some streams such as Trail Creek and the Vermillion River.

Capture and Marking

The first year of the juvenile Harlequin Duck site fidelity and survival study got off to a good start. A total of 62 juvenile birds from 4 drainages were captured and marked (Table 3, Appendix D & E). Five adult males and 18 adult females were marked in addition to the 4 males and 2 females marked in 1991 (Table 3, Appendix D & E).

The two females and one male marked with nasal disks on Marten Creek in 1991 were recaptured in 1992. No problems with the nasal disks were apparent. The ducks appeared healthy and each female successfully raised broods of 4 young during 1992.
However, USFWS aluminum leg bands were moderately worn on one female and severely worn on the other (the last number was nearly illegible). Additionally, one of the females had apparently been shot, probably in the fall 1991 hunting season; several healed, round, shot-sized holes were present in the foot webbing.

While banding in Glacier National Park in August we noted that some birds had tarsi too short to safely use both a plastic leg band and USFWS band on the same leg. In those cases we split the plastic band to make it only 1/2 as tall. This appeared to work well on one bird recaptured in September. However, we did note some injury to the hallux on both legs on another recaptured bird where all bands were full height. We used one split band (top) and one whole band (bottom) on all subsequent birds banded. We recommend that all birds banded in the future have the upper color band split in half to prevent this problem from reoccurring.

<table>
<thead>
<tr>
<th>Location</th>
<th>Male</th>
<th>Female</th>
<th>(Pair)</th>
<th>Juv.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDonald Creek, Glacier NP</td>
<td>13</td>
<td></td>
<td></td>
<td>40</td>
<td>53</td>
</tr>
<tr>
<td>Trail Creek, Flathead Co.</td>
<td>3</td>
<td>3</td>
<td>(2)</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Spotted Bear R., Flathead Co.</td>
<td></td>
<td>1</td>
<td></td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Vermillion River, Sanders Co.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Marten Creek, Sanders Co.</td>
<td>5</td>
<td>3</td>
<td>(2)</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>(includes 2 pairs &amp; 2 single males from 1991; 2 females and 1 male from 91 were also recaptured in 92)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>9</td>
<td>20</td>
<td>(4)</td>
<td>62</td>
<td>91</td>
</tr>
</tbody>
</table>
Adult harlequins show strong fidelity to breeding sites (Bengston 1972, Kuchel 1977, Dzinbal 1982, Wallen 1987). The extent of fidelity to natal areas by adults breeding for the first time is unknown, but is likely to be strong. Colonization of currently unoccupied streams is likely to be a rare event. Harlequins appear sensitive to human disturbance (Clarkson 1992, Cassirer and Groves 1991). Repeated disturbances may discourage nesting at traditional sites and reduce productivity (Rodrick and Milner 1991). However, proximity to trails and roads does not always correlate with reduced reproductive success. Sixty percent of harlequin sites were within 50 m of trails on the Rocky Mountain Front (Diamond and Finnegan 1992). In this case, most harlequin streams are located in roadless or wilderness areas and receive limited human activity prior to or during the nesting period.

Mid-stream loafing sites are important in breeding areas (Cassirer and Groves 1990). Brood rearing areas in Idaho and Montana west of the Continental Divide have a dense shrub or timber/shrub mosaic on the banks (Cassirer and Groves 1989, Gangemi 1991). East of the Divide in Montana stream banks are more open, and most observation sites had banks composed of gravel, grass-forb, or bedrock habitat (Diamond and Finnegan 1992, Markum and Genter 1990). Low benthic macroinvertebrate biomass may limit the number and productivity of harlequins (Bengston and Ulfstrand 1971, Kuchel 1977). Given these factors, we recommend the following management strategies on harlequin streams:
1) minimize unnecessary human activity along harlequin streams during May through August (mid-May through June is the critical nesting period when birds are most sensitive);

2) a stream buffer of > 50 m should be maintained on both sides of streams for most activities; roads and trails should be > 100 m from streams and not visible from the streams;

3) major activities (road building, timber harvest, restoration projects, etc.) that are to be undertaken within 300 m of a stream should be done during the period 15 August - 1 April;

4) minor activities within stream buffers (e.g. trail maintenance or reconstruction) should not be preformed during 1 June - 15 July;

5) avoid activities which will change stream runoff patterns or decrease water quality;

6) limit access to harlequin streams during the breeding period May - August; in particular do not promote activities which will bring people into contact with harlequins; and

7) in any area where major management activities are to take place in potential harlequin habitat, survey for the preceding two years both for pairs (May) and broods (mid-July to mid-August). If harlequins are present, develop a monitoring plan for harlequins during and after the activity is to take place.

Long term research and management needs involve:

1) develop a baseline status report of current and historic
harlequin populations in Montana (currently in preparation);
2) investigate site fidelity, inter-stream movement, reproduction
and mortality to allow estimations and modeling of what
constitutes a viable harlequin population (began in 1992);
3) determining the primary limiting factors for harlequin duck
populations in occupied and historic habitat situations in
the Northern Rockies;
4) developing standardized surveying protocols for occupied and
potential harlequin streams;
5) developing management guidelines for maintaining harlequin
populations and habitat; and
6) assess the impacts of past and current habitat modification
and develop techniques to restore harlequin populations and
habitat.
LITERATURE CITED


Appendix A. Data forms
Harlequin Duck Survey Form.

Date ____________ Time ______________ Surveyor(s) _______________
(Start/Finish)

Stream
Include map with exact area(s) surveyed on back of this page

Weather
(Temp., wind dir & speed, cloud cover, precip last 24 hrs)

Accessibility?

Group #_________ # Individuals _______________
(Put on map)

Sexes & Ages

Marked?

Accessibility?

Group #_________ # Individuals _______________
(Put on map)

Sexes & Ages

Marked?

Accessibility?

Group #_________ # Individuals _______________
(Put on map)

Sexes & Ages

Marked?

Accessibility?

NOTES:

21
Harlequin Duck Banding Form.

Date ______ Location _________________________________

Sex ______ Age ______ T____ N, R____ W, Section _______
Nasal Saddles ______ Color Bands ______

Band #_______ Lft_______ Rt_______ Lt_______ Rt_______

Weight ______ Wing chord_______ Tail_______ Tarsus_______

Molt _________________________________

Notes 
(with other ducks? marked, sex, age? etc.)

.................................................................................................................................

Date ______ Location _________________________________

Sex ______ Age ______ T____ N, R____ W, Section _______
Nasal Saddles ______ Color Bands ______

Band #_______ Lft_______ Rt_______ Lt_______ Rt_______

Weight ______ Wing chord_______ Tail_______ Tarsus_______

Molt______________________________

Notes 
(with other ducks? marked, sex, age? etc.)

.................................................................................................................................

Date ______ Location _________________________________

Sex ______ Age ______ T____ N, R____ W, Section _______
Nasal Saddles ______ Color Bands ______

Band #_______ Lft_______ Rt_______ Lt_______ Rt_______

Weight ______ Wing chord_______ Tail_______ Tarsus_______

Molt______________________________

Notes 
(with other ducks? marked, sex, age? etc.)

.................................................................................................................................

NOTES:

.................................................................
Appendix B. Element Occurrence Records from 1992 surveys
HISTRIONICUS HISTRIONICUS * 002
HARLEQUIN DUCK

Global rank: G5  Forest Service status: SENSITIVE
State rank: S2  Federal Status: C2

Survey site name: UPPER MCDONALD CREEK
EO rank: A
EO rank comments: 11-14 PAIRS PRESENT

County: FLATHEAD
USGS quadrangle: MOUNT CANNON
AHERN PASS
MOUNT GEDUHN

Township: 034N  Range: 017W  Section: 27  TRS comments: NW4

Survey date:  Elevation: 3153 - 4200
First observation: 1973  Slope/aspect:
Last observation: 1992-09-02  Size (acres): 60

Location:
UPPER MCDONALD CREEK IN GLACIER NP; STREAM SECTION FROM CONTINENTAL CREEK SW TO THE NORTH END OF LAKE MCDONALD, AND INCLUDING MINERAL CREEK AND AVALANCHE CREEK AND LAKE.

Element occurrence data:
A POPULATION OF HARLEQUIN DUCKS WAS STUDIED OVER 4 YEARS. 31 BIRDS, INCLUDING 7 JUVENILES, WERE BANDED. 11-14 PAIRS PRESENT. 6/5/90: 4 PR, 11 MALE, 3 FEMALE PRESENT. 1992: A MINIMUM OF 14 BROODS PRODUCED A TOTAL OF 45 YOUNG; COLOR BANDED 40 YG AND 13 ADULT FEMALES.

General site description:
CA. 20 MILES OF MOUNTAIN STREAM.

Land owner/manager:
GLACIER NATIONAL PARK

Comments:
EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN. SPRING PAIRS AND LATE SEASON YOUNG REPORTED ON LOWER MCDONALD CREEK MAY OR MAY NOT BE BIRDS FROM UPPER MCDONALD CREEK POPULATION.

Information source:

Specimens:
HISTRIONICUS HISTRIONICUS * 006
HARLEQUIN DUCK

Global rank: G5  Forest Service status: SENSITIVE
State rank:  S2  Federal Status: C2

Survey site name: MARTEN CREEK
EO rank:
EO rank comments:

County: SANDERS

USGS quadrangle: NOXON
BLOOM PEAK

Township:  Range:  Section:  TRS comments:
025N  032W  32  ADDITIONAL SECTIONS

Survey date:  Elévation:  2330  -2850
First observation:  1986  Slope/aspect:
Last observation:  1992-08-04  Size (acres):  0

Location:
THE SOUTH AND NORTH FORKS OF MARTEN CREEK ARE ON THE WEST
SIDE OF NOXON RESERVOIR, CA. 8 MILES NW OF TROUT CREEK.

Element occurrence data:
(SEE ALSO: ECOMONITORING DATA) GENERALLY 2 TO 4 PAIRS BREED.

General site description:
MOUTH OF MARTEN CREEK IS MAPPED. THIS EO INCLUDES THE NORTH
BRANCH (CA. 5 MILES) AND SOUTH BRANCH (CA. 1.5 MILES) AS
CONTIGUOUS HABITAT.

"Land owner/manager:
KOOTENAI NATIONAL FOREST, CABINET RANGER DISTRICT
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:

Information source:
WILDLIFE BIOLOGIST, CABINET DISTRICT, KOOTENAI NATIONAL
FOREST, HCR2, BOX 210, TROUT CREEK, MT 59874.

Specimens:
Monitoring Subject--
Scientific Name: HISTRIONICUS HISTRIONICUS
Common Name: HARLEQUIN DUCK
G Rank: G5
S Rank: S2
Sitename: Marten Creek

Element Occurrences Of Concern--
Element Occurrence Code: ABNJB15010006*MT
Scientific Name: HISTRIONICUS HISTRIONICUS
G Rank: G5
S Rank: S2
Sitename:

Goals & Objectives--
Management Plan: Monitoring Plan: YES
Monitoring Level: QUANTITATIVE ESTIMATE OF ABUNDANCE
Management Goals:
Monitoring Goals:
TRACK CHANGES IN THE POPULATION AND REPRODUCTIVE SUCCESS; DETERMINE SITE FIDELITY.

Monitoring Procedure--
Parameters: Threshold:
MALES 1
FEMALES 1
PAIRS 1
JUVENILES 1
BROODS 1

Sampling Methodology:
Sampling Frequency:
MINIMUM TWICE PER YEAR, CA. MAY & JULY/AUGUST.

Visit Date(s): 1987-06-18
1987-06-22
1988-06-18
1989
1992 05 12
1992 06 01
1992 08 04

Coordinator: REICHEI, JIM

Trends & Recommendations--
Short-term Trend: STABLE
Long-term Trend:
Trend Comments: POPULATION APPEARS STABLE OVER LAST 5 YEARS.
Current Condition: GOOD
Condition Comments: CURRENT POPULATION SEEMS TO BE MAXIMUM THAT HABITAT CAN SUPPORT.
Trend Information Updated: 1993-03-24
Management Recommendations:

Monitoring Recommendations:

References--
Sourcecode: Citation:
Visit Date: 1987-06-18
Observer: ASH, E. & CROWE, E.
Person hours:
Effort Comments: NORTH FORK SURVEY.

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters:</th>
<th>Quantitative Summary:</th>
<th>Qualifying Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PAIRS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Other Observations:
Ecomonitoring Visit Summary
Visit Code: EM.USMTHP2*1*03

Visit Date: 1987-06-22
Observer: ASH, E. & CROWE, E.

Person hours:  

Effort Comments: SOUTH FORK SURVEY.

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PAIRS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Other Observations: MAY BE DUPLICATION OF BROODS OBSERVED ON NORTH FORK ON 6/18.
Visit Date: 1988-06-18
Observer:
Person hours: 
Effort Comments:

Ecomonitoring Visit Summary
Visit Code: EM.USMTHP2*1*04

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>1 + ?</td>
<td></td>
</tr>
<tr>
<td>Pairs</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Juveniles</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Broods</td>
<td>1</td>
<td>NEAR DEVILS GAP (NORTH FO</td>
</tr>
</tbody>
</table>

Other Observations: OTHER ADULTS OBSERVED, BUT DETAILS MISSING.
Ecomonitoring Visit Summary
Visit Code: EM.USMTHP2*1*05

Visit Date: 1989
Observer:
Person hours:
Effort Comments:

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PAIRS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td>2</td>
<td>ON NORTH FORK</td>
</tr>
</tbody>
</table>

Other Observations:
Visit Date: 1992 05 12
Observer: GENTER, DAVID
Person hours: 2.50
Effort Comments: SURVEYED SOUTH FORK UP TO SORREL GULCH.

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PAIRS</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Visit Date: 1992 06 01
Observer: REICHEL, JIM, et al.
Person hours: 2.00

Effort Comments: SPOT SURVEYED CA. LOWER MILE OF NORTH FORK; WALKED UPSTREAM LOWER MILE OF SOUTH FORK.

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other Observations: NO DUCKS OBSERVED.
**Visit Date:** 1992 08 04  
**Observer:** REICHEL, JIM; BECKSTROM, STAN  
**Person hours:** 20.00  

**Effort Comments:** SURVEYED NORTH FORK UP TO CLINTON GULCH; LOWER MILE OF SOUTH FORK (STREAMS INTERMITTENT ABOVE THOSE POINTS). MOST TIME SPENT BANDING - 12 BIRDS FIRST DAY AND 3 BIRDS SECOND DAY.

<table>
<thead>
<tr>
<th>Ecomonitoring Parameters</th>
<th>Quantitative Summary</th>
<th>Qualifying Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>FEMALES</td>
<td>5</td>
<td>SINGLE FEMALE IN BAY</td>
</tr>
<tr>
<td>PAIRS</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>JUVENILES</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>BROODS</td>
<td>4</td>
<td>BROODS OF 4,4,4,1</td>
</tr>
</tbody>
</table>

**Other Observations:** BROODS LOCATED AT MOUTH OF MARTEN CREEK (2); CA. 200m UP FROM MOUTH; Sec. 25 SW4SE4.
HISTRIONICUS HISTRIONICUS * 008
HARLEQUIN DUCK

Global rank: G5  Forest Service status: SENSITIVE
State rank: S2  Federal Status: C2

Survey site name: VERMILLION RIVER
EO rank:  EO rank comments:

County: SANDERS

USGS quadrangle: TROUT CREEK
SEVEN POINT MOUNTAIN
VERMILLION PEAK
MILLER LAKE

Township: 024N  Range: 031W  Section: 12  TRS comments: SW4

Survey date: Elevation: 2340 - 3400
First observation: 1988  Slope/aspect:
Last observation: 1992-06-01  Size (acres): 0

Location: FROM TROUT CREEK GO NORTH 1.5 MILES ON SR 200, RIGHT 5 MILES ON THE BLUE SLIDE ROAD, THEN LEFT 2 MILES UP THE VERMILLION RIVER ROAD.

Element occurrence data:
1988: HEN WITH 3 YOUNG OBSERVED. 1989: 2 FEMALES WITH BROODS OBSERVED, ONE IN MAPPED LOCATION, ONE IN T24N,R30W,8

General site description:
A CA. 10 MILE STREAM SEGMENT, FROM VERMILLION BAY TO VERMILLION FALLS.

Land owner/manager:
KOOTENAI NATIONAL FOREST, CABINET RANGER DISTRICT
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
PLUM CREEK TIMBER COMPANY

Comments:
PLACER MINING IN AREA. EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN.

Information source:

Specimens:

Element Occurrence Record
Harlequin Duck Surveys in
Western Montana: 1992
HISTRIONICUS HISTRIONICUS * 017
HARLEQUIN DUCK

Global rank: G5  Forest Service status: SENSITIVE
State rank: S2  Federal Status: C2

Survey site name: SULLIVAN CREEK
EO rank:  
EO rank comments:  

County: FLATHEAD

USGS quadrangle: CONNOR CREEK

Township: 026N  Range: 016W  Section: 31  TRS comments: NE4NW4

Survey date: 1990  Elevation: 4100
First observation: 1990  Slope/aspect: 
Last observation: 1992-08-08  Size (acres): 

Location:
CA. 6 MILES UP FS ROAD #547 ALONG SULLIVAN CREEK, ON THE WEST SIDE OF HUNGRY HORSE RESERVOIR.

Element occurrence data:
1990: FEMALE AND 4 YOUNG OBSERVED. 1992: 2 UNAGED BIRDS SEEN 8 AUG.

General site description:

Land owner/manager:
FLATHEAD NATIONAL FOREST, SPOTTED BEAR RANGER DISTRICT

Comments:

Information source:
CARLSON, J. C. 1990. RESULTS OF HARLEQUIN DUCK SURVEYS IN 1990 ON THE FLATHEAD NATIONAL FOREST, MONTANA. UNPUBLISHED REPORT, 31PP.

Specimens:
HISTRIONICUS HISTRIONICUS * 018
HARLEQUIN DUCK

Global rank: G5
State rank: S2

Forest Service status: SENSITIVE
Federal Status: C2

Survey site name: MIDDLE FORK FLATHEAD RIVER
EO rank: EO
EO rank comments:

County: FLATHEAD
USGS quadrangle: NIMROD

Township: 028N  Range: 015W  Section: 19

Survey date: 1990  Elevation: 4050
First observation: 1990  Slope/aspect:
Last observation: 1992-07-10  Size (acres):

Location:
ALONG THE MIDDLE FORK FLATHEAD RIVER, CA. 5 MILES BY TRAIL
UPSTREAM (SOUTH) OF US 2.

Element occurrence data:
1990: 1 FEMALE AND 4 YOUNG OBSERVED. 1992: 1 FEMALE WITH 4
CHICKS PLUS A SECOND FEMALE OBSERVED NEAR MOUTH OF SPRUCE
CREEK.

General site description:

Land owner/manager:
GREAT BEAR WILDERNESS
FLATHEAD NATIONAL FOREST, HUNGRY HORSE RANGER DISTRICT

Comments:
1992 SIGHTING BY SARAH SIGLER (USFS).

Information source:
CARLSON, J. C. 1990. RESULTS OF HARLEQUIN DUCK SURVEYS IN
1990 ON THE FLATHEAD NATIONAL FOREST, MONTANA. UNPUBLISHED
REPORT, 31PP.

Specimens:
HISTRIONICUS HISTRIONICUS * 019
HARLEQUIN DUCK

Global rank: G5     Forest Service status: SENSITIVE
State rank: S2      Federal Status: C2

Survey site name: TRAIL CREEK
EO rank:           EO rank comments:

County: FLATHEAD

USGS quadrangle: TRAILCREEK
MOUNT HEFTY

Township: 037N  Range: 022W  Section: 30  TRS comments: SE4NE4

Survey date:       Elevation: 3800 - 4280
First observation: 1990  Slope/aspect:
Last observation: 1992-08-12  Size (acres):

Location:
TAKE THE NORTH FORK FLATHEAD ROAD PAST POLEBRIDGE TO FS ROAD #114, THEN CA. 3 MILES WEST.

Element occurrence data:
1990: MULTIPLE SIGHTINGS OF UP TO 4 YOUNG; MAY BE SEVERAL BROODS. 1992: 4-5 PAIRS PRESENT; MINIMUM 2 BROODS PRODUCED 8 YG; MARKED 2 FEMALES, 3 MALES, AND 4 YOUNG.

General site description:
A CA. 7 MILE SEGMENT OF MOUNTAIN STREAM, SECTIONS OF WHICH ARE INTERMITTENT DURING LATE SUMMER.

Land owner/manager:
FLATHEAD NATIONAL FOREST, GLACIER VIEW RANGER DISTRICT
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
STATE LAND - UNDESIGNATED

Comments:
EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN.

Information source:
CARLSON, J. C. 1990. RESULTS OF HARLEQUIN DUCK SURVEYS IN 1990 ON THE FLATHEAD NATIONAL FOREST, MONTANA. UNPUBLISHED REPORT, 31PP.

Specimens:
HISTRIONICUS HISTRIONICUS * 022
HARLEQUIN DUCK

Global rank: G5    Forest Service status: SENSITIVE
State rank: S2    Federal Status: C2

Survey site name: NORTH FORK BLACKFOOT RIVER
EO rank:
EO rank comments:

County: POWELL
        LEWIS AND CLARK

USGS quadrangle: LAKE MOUNTAIN

Township: Range: Section: TRS comments:
016N 011W 23 NW4SW4

Survey date: Elevation: 4700 -
First observation: 1992-08-28  Slope/aspect: -/-
Last observation: 1992-08-22  Size (acres):

Location:
FROM SR 200 EAST OF OVANDO, FOLLOW SIGNS TO NORTH FORK
BLACKFOOT RIVER TRAILHEAD AND GO UP TRAIL CA. 1 MILE.

Element occurrence data:
1992: 3 DUCKS SIGHTED - JUVENILES, OR HEN WITH 2 JUVENILES.

General site description:

Land owner/manager:
LOLO NATIONAL FOREST, SEELEY LAKE RANGER DISTRICT

Comments:
ACTUAL BREEDING LOCATION UNKNOWN, SINCE BROODS MIGHT HAVE
TRAVELED SOME DISTANCE BY DATE OF THESE SIGHTINGS.

Information source:
CASTREN, CHAD. 1992. [REPORT ON FIELD SURVEYS FOR HARLEQUIN
DUCKS, SUMMER 1992.]

Specimens:

Element Occurrence Record
Harlequin Duck Surveys in
Western Montana: 1992
HISTRIONICUS HISTRIONICUS * 023
HARLEQUIN DUCK

Global rank: G5  Forest Service status: SENSITIVE
State rank: S2  Federal Status: C2

Survey site name: LITTLE SALMON CREEK
EO rank:
EO rank comments:

County: FLATHEAD
USGS quadrangle: MARMOT MOUNTAIN
PAGODA MOUNTAIN

Township: 022N  Range: 014W  Section: 27  TRS comments: NE4NW4

Survey date: 1992-07-23  Elevation: 4200 -4250
First observation: 1992-07-23  Slope/aspect: -/-

Location:
IN THE BOB MARSHALL WILDERNESS CA. 1.25 MILES UP LITTLE
SALMON CREEK FROM THE SOUTH FORK FLATHEAD RIVER.

Element occurrence data:
FEMALE WITH 5 YOUNG (LIGHT COLORED, DOWNY LOOKING) OBSERVED.
ALSO FEMALE WITH 3 YOUNG SIGHTED CA. 1 MILE DOWNSTREAM, NEAR
PACK BRIDGE.

General site description:
CA. 2 MILE SEGMENT OF MOUNTAIN STREAM.

Land owner/manager:
BOB MARSHALL WILDERNESS
FLATHEAD NATIONAL FOREST, SPOTTED BEAR RANGER DISTRICT

Comments:
EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN.

Information source:
CASTREN, CHAD. 1992. [REPORT ON FIELD SURVEYS FOR HARLEQUIN
DUCKS, SUMMER 1992.]

Specimens:

Element Occurrence Record
Harlequin Duck Surveys in
Western Montana: 1992
HISTRIONICUS HISTRIONICUS * 024
HARLEQUIN DUCK

Global rank: G5  
State rank:  S2  

Forest Service status:  SENSITIVE  
Federal Status:  C2  

Survey site name:  WHITE RIVER  
EO rank:  
EO rank comments:  

County:  FLATHEAD  
POWELL  

USGS quadrangle:  HAYSTACK MOUNTAIN  

Township:  021N  
Range:  012W  
Section:  6  

EO rank comments:  

Survey date:  
First observation:  1992-07-19  
Last observation:  1992-07-21  

Elevation:  4700 -4850  
Slope/aspect:  -/-  
Size (acres):  

Location:  
IN THE BOB MARSHALL WILDERNESS, NEAR THE CONFLUENCE OF WHITE RIVER AND ITS SOUTH FORK, CA. 15 AIR MILES ENE OF BENCHMARK.  

Element occurrence data:  
3 BROODS SIGHTED;  2 (FEMALE +3, FEMALE +1) AT SOUTH END OF CANYON BELOW NEEDLE FALLS AND 1 (FEMALE +2) CA. 0.5 MILE DOWNSTREAM OF CONFLUENCE.  

General site description:  
CA. 2 MILE SEGMENT OF MOUNTAIN STREAM.  

Land owner/manager:  
BOB MARSHALL WILDERNESS  
FLATHEAD NATIONAL FOREST, SPOTTED BEAR RANGER DISTRICT  

Comments:  
EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN.  

Information source:  
CASTREN, CHAD. 1992. [REPORT ON FIELD SURVEYS FOR HARLEQUIN DUCKS, SUMMER 1992.]  

Specimens:  

Element Occurrence Record
Harlequin Duck Surveys in
Western Montana: 1992

40
Global rank: G5  
State rank: S2

Forest Service status: SENSITIVE  
Federal Status: C2

Survey site name: SPOTTED BEAR RIVER
EO rank:
EO rank comments:

County: FLATHEAD

USGS quadrangle: WHITCOMB PEAK

Township: 025N  
Range: 014W  
Section: 14  
TRS comments: 13

Survey date: 1992-08-13  
First observation: 1992-08-13  
Last observation: 1992-08-13

Elevation: 4050 -4200  
Slope/aspect: +/-  
Size (acres): 

Location:
FROM HUNGRY HORSE, GO UP EAST SIDE OF RESERVOIR TO SPOTTED BEAR RIVER (CA. 50 MILES), THEN UP SPOTTED BEAR RIVER TO BEAVER CREEK CAMPGROUND.

Element occurrence data:
2 BROODS CAPTURED AND BANDED. ONE AT BEAVER CREEK (4 JUVENILES) AND ONE AT WHITCOMB CREEK (FEMALE WITH 3 JUVENILES).

General site description:
STREAM REACH OF CA. 2 MILES.

Land owner/manager:
FLATHEAD NATIONAL FOREST, SPOTTED BEAR RANGER DISTRICT

Comments:
EXTENT OF OCCUPIED BREEDING HABITAT UNKNOWN.

Information source:

Specimens:
Appendix C. Maps of 1992 Element Occurrence Records
Histrionicus histrionicus

Vermilion River (008)
Histrionicus histrionicus

Middle Fork Flathead River (018)
Histrionicus histrionicus  N. Fork Blackfoot River (022)
Histrionicus histrionicus

White River (024)
Histrionicus histrionicus  Spotted Bear River (029)
Appendix D. List of Harlequin Ducks marked in 1992

Harlequin Duck marking outside Glacier National Park utilizing nasal discs and USFWS bands.

\[
\begin{array}{lcl}
C = \text{Circle} & \text{red} = \text{red} \\
T = \text{Triangle} & \text{grn} = \text{green} \\
S = \text{Square} & \text{blu} = \text{blue} \\
& \text{yel} = \text{yellow} \\
& \text{blk} = \text{black} \\
& \text{wht} = \text{white} \\
& \text{ora} = \text{orange}
\end{array}
\]

Marten Creek, Kootenai National Forest, Sanders Co., MT

<table>
<thead>
<tr>
<th>Site</th>
<th>USFWS Band #</th>
<th>Nasal Discs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>left</td>
</tr>
<tr>
<td>1) 4 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76007</td>
<td>T-blk</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76008</td>
<td>T-grn</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76014</td>
<td>S-grn</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76015</td>
<td>C-wht</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76016</td>
<td>C-blu</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76017</td>
<td>C-grn</td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76018</td>
<td>T-grn</td>
</tr>
</tbody>
</table>

(Replaced worn band on adult female [double green triangle, old number 765-27559])

5 Aug 92

| Juvenile | 755-76019 | S-red | T-grn |
| Juvenile | 755-76020 | S-red | T-blk |

(with female 765-27556 [double black triangle] and 2 unmarked juveniles)

2) 4 Aug 92

| Juvenile | 755-76009 | T-blk | S-red |
| Juvenile | 755-76010 | T-yel | S-red |
| Adult Female | 755-76011 | T-yel | T-grn |
| Juvenile | 755-76012 | S-ora | S-red |
| Juvenile | 755-76013 | S-blu | S-red |

3) 29 May 92

| Adult Male | 765-27561 | T-Grn | T-Grn |

(2 pairs and 2 single males were banded in 1991)

Vermillion River, Kootenai National Forest, Sanders Co., MT

1) 2 June 92

| Adult Male | 765-27562 | T-yel | T-yel |
### Trail Creek, Flathead National Forest, Flathead Co., MT

<table>
<thead>
<tr>
<th>Site</th>
<th>USFWS Band #</th>
<th>Nasal Disks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>left</td>
</tr>
<tr>
<td>1) 12 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76042</td>
<td>S-red</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76043</td>
<td>S-red</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76044</td>
<td>S-red</td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76045</td>
<td>S-ora</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76046</td>
<td>S-red</td>
</tr>
<tr>
<td>2) 10 June 92</td>
<td>765-27563</td>
<td>C-blu</td>
</tr>
<tr>
<td>Adult Male</td>
<td>765-27564</td>
<td>S-ora</td>
</tr>
<tr>
<td>3) 10 June 92</td>
<td>765-27565</td>
<td>C-red</td>
</tr>
<tr>
<td>Adult Male</td>
<td>765-27566</td>
<td>C-blu</td>
</tr>
<tr>
<td>4) 11 June 92</td>
<td>765-27567</td>
<td>C-grn</td>
</tr>
<tr>
<td>(with unmarked female and male 765-27563)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Spotted Bear River, Flathead National Forest, Flathead Co., MT

<table>
<thead>
<tr>
<th>Site</th>
<th>USFWS Band #</th>
<th>Nasal Disks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>left</td>
</tr>
<tr>
<td>1) 13 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile male</td>
<td>765-27589</td>
<td>C-red</td>
</tr>
<tr>
<td>Juvenile ?male</td>
<td>765-27590</td>
<td>C-red</td>
</tr>
<tr>
<td>Juv. female</td>
<td>765-27591</td>
<td>C-red</td>
</tr>
<tr>
<td>Juv. female?</td>
<td>765-27592</td>
<td>C-red</td>
</tr>
<tr>
<td>2) 13 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile ?male</td>
<td>765-27593</td>
<td>C-red</td>
</tr>
<tr>
<td>Juvenile ?male</td>
<td>765-27594</td>
<td>C-red</td>
</tr>
<tr>
<td>Adult female</td>
<td>765-27595</td>
<td>C-red</td>
</tr>
<tr>
<td>Juv. male?</td>
<td>765-27596</td>
<td>C-red</td>
</tr>
</tbody>
</table>
Colored Leg Bands used in Glacier National Park

p = pink
r = red
g = green
b = blue
y = yellow
w = white
o = orange
s = silver (FWS band)

Glacier National Park

<table>
<thead>
<tr>
<th>Site</th>
<th>USFWS Band #</th>
<th>Plastic leg bands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>left</td>
<td>right</td>
</tr>
<tr>
<td>1) 10 Aug 92</td>
<td>Juvenile</td>
<td>755-76021</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76022</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76023</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76024</td>
</tr>
<tr>
<td></td>
<td>Adult Female</td>
<td>755-76025</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76026</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76027</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76028</td>
</tr>
<tr>
<td>(1-2 additional juveniles were present but not captured)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) 10 Aug 92</td>
<td>Juvenile</td>
<td>755-76029</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76030</td>
</tr>
<tr>
<td></td>
<td>Adult Female</td>
<td>755-76031</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76032</td>
</tr>
<tr>
<td>3) 11 Aug 92</td>
<td>Adult Female</td>
<td>755-76033</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76034</td>
</tr>
<tr>
<td>(one additional juvenile was present but not captured)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A) 2 Sept 92</td>
<td>Juvenile</td>
<td>755-76047</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76048</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76049</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>755-76050</td>
</tr>
<tr>
<td></td>
<td>Adult Female</td>
<td>755-76051</td>
</tr>
<tr>
<td>4) 10 Aug 92</td>
<td>Juvenile</td>
<td>765-27568</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>765-27569</td>
</tr>
<tr>
<td></td>
<td>Juvenile</td>
<td>765-27570</td>
</tr>
<tr>
<td></td>
<td>Adult Female</td>
<td>765-27571</td>
</tr>
<tr>
<td>Site</td>
<td>USFWS Band #</td>
<td>Plastic leg bands</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>4A) 2 Sept 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76053</td>
<td>y/g</td>
</tr>
<tr>
<td>5) 11 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27572</td>
<td>w/b</td>
</tr>
<tr>
<td>Adult Female</td>
<td>765-27573</td>
<td>g/w</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27574</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27575</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27576</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27577</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27578</td>
<td>p/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(one additional juvenile was present but not captured)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) 11 Aug 92</td>
<td>(2 groups)</td>
<td></td>
</tr>
<tr>
<td>Adult Female</td>
<td>765-27579</td>
<td>b/w</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27580</td>
<td>w/g</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27581</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27582</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27583</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27584</td>
<td>s</td>
</tr>
<tr>
<td>Adult Female</td>
<td>765-27585</td>
<td>w/s</td>
</tr>
<tr>
<td>7) 11 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Female</td>
<td>765-27586</td>
<td>w/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27587</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>765-27588</td>
<td>o/r</td>
</tr>
<tr>
<td>7A) 2 Sept 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76054</td>
<td>o/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76055</td>
<td>y/y</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76056</td>
<td>y/w</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76057</td>
<td>p/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76058</td>
<td>p/s</td>
</tr>
<tr>
<td>8) 11 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76035</td>
<td>p/s</td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76036</td>
<td>o/w</td>
</tr>
<tr>
<td>9) 11 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76037</td>
<td>y/o</td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76038</td>
<td>o/o</td>
</tr>
<tr>
<td>(two additional unmarked downy young were present)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) 11 Aug 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult Female</td>
<td>755-76039</td>
<td>o/s</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76040</td>
<td>w/o</td>
</tr>
<tr>
<td>Juvenile</td>
<td>755-76041</td>
<td>p/s</td>
</tr>
</tbody>
</table>
Appendix E. Maps of locations of Harlequin Ducks marked in 1992
ROAD CLASSIFICATION

Primary highway, all weather, hard surface
Light-duty road, all weather, improved surface
Secondary highway, all weather, hard surface
Unimproved road, fair or dry weather

NOXON, MONT.

Figure 1. Marten Creek Harlequin Duck marking sites, 1992.

QUAD: Noxon

58
Figure. Marten Creek Harlequin Duck marking site, 1992.  
QUAD: Bloom Peak
Figure 5. Vermilion River Harlequin Duck marking site, 1992.

QUAD: Seven Point Mountain

60
Figure 1. Trail Creek Harlequin Duck marking sites, 1992.
QUAD: Trail Creek
Figure 1. Trail Creek Harlequin Duck marking sites, 1992.

QUAD: Mount Hefty
Figure 1. Spotted Bear River Harlequin Duck marking sites, 1992.

QUAD: Whitcomb Peak
Figure 2. McDonald Creek Harlequin duck marking sites, 1992. QUAD: Mount Cannon
Figure. McDonald Creek Harlequin Duck marking sites, 1992.
QUAD: Mount Cannon
Figure 1. McDonald Creek Harlequin Duck marking sites, 1992.
QUAD: Mount Cannon
Figure 1. Mineral Creek Harlequin Duck marking site, 1992.
QUAD: Ahern Pass