

STATUS AND DISTRIBUTION
OF HARLEQUIN DUCKS (Histrionicus histrionicus)
IN NORTHERN IDAHO

by

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TABLE OF CONTENTS

ABSTRACT	iii
INTRODUCTION	1
STATEMENT OF THE PROBLEM	6
METHODS	9
RESULTS AND DISCUSSION	11
MANAGEMENT CONSIDERATIONS	16
ACKNOWLEDGEMENTS	18
LITERATURE CITED	19
APPENDICES	22
Appendix A - Harlequin duck sightings compiled by Reese and Melquist (1985) for Northern Idaho	23
Appendix B - Poster used to advertise the research effort	26
Appendix C - Special Animal Field Survey Form	28
Appendix D - Location of sites surveyed during 1987	32

ABSTRACT

A survey of 30 streams was undertaken to determine the status and distribution of harlequin ducks in northern Idaho. Six sightings were recorded during the survey and 14 additional reports by other observers were noted. These mountain ducks arrived in Idaho in early May. Drakes and nonbreeding females remained in Idaho until mid-June. The young were born in June. By mid-August the breeding adult females and juveniles had departed the study area. Suitability of habitat for harlequin ducks in northern Idaho was investigated. Additional quantitative data are necessary to determine the success of breeding attempts and production of young throughout the study area. Recommendations are presented for the timing and location of future surveys.

INTRODUCTION

Harlequin ducks (Histrionicus histrionicus) are more closely related to fast moving water than any other species of waterfowl in the northern hemisphere (Bengtson 1966). Their winter range corresponds to nutrient-rich, rocky, ocean shorelines, while breeding takes place along clear mountain streams removed from human disturbance. Harlequins are considered abundant only in the northern portion of their range where up to one million birds have been noted to winter on the Aleutian Islands (Bellrose 1980).

The species is currently grouped into two populations based on the ocean in which they winter (Pacific or Atlantic). The Pacific population is by far the largest (Palmer 1976, Todd 1979, Bellrose 1980). The western North American breeding distribution (Figure 1) extends from NW Wyoming northward through the Rocky Mountains into northern Canada and Alaska, and from the northern Sierra Nevadas of California through the Cascade and Coastal ranges of Oregon, Washington and British Columbia. Breeding also occurs in Newfoundland, Greenland and Iceland.

Numerous sightings of harlequins have been documented from throughout their summer range. A lack of quantitative data though, has given the impression that these birds are rare breeders south of Canada.



Figure 1. Breeding distribution of harlequin ducks in North America (from Bellrose 1980).

The historic distribution in the United States is poorly understood. Harlequins were once thought to breed as far south as central Colorado (Bent 1962). A specimen collected in 1868 indicates that harlequins did breed in SW Colorado but have since vacated this portion of their breeding range (Parkes and Nelson 1976). The Hayden expedition of 1860 reported seeing harlequins in northwest Wyoming (McCreary 1937). Very little development has occurred in this portion of Wyoming and harlequins have continued to return and breed annually. In the 19th century harlequins were known to be common winter birds on the coast of New England and were occasionally seen in the Boston markets prior to 1840. However, by the turn of the 20th century these birds were considered as "formerly occurring and likely to become extinct" (Forbush 1912).

Harlequin breeding habitat has been studied at few locations (Bengtson 1966, Kuchel 1977, Dzinbal 1982, Wallen 1987). In Iceland, where breeding densities are greater than in the Rocky Mountains, harlequins prefer to nest on islands in the larger rivers (Bengtson 1966). Two studies have been done to assess breeding chronology and habitat use in the Rocky Mountains (Kuchel 1976, Wallen 1987). These studies noted that brood rearing activities were associated with low gradient stream sections with dense vegetation lining the streambanks. The locations where harlequins breed most successfully are removed from concentrated human activities (Kuchel 1977, Wallen 1987).

Harlequin ducks spend only a short time on their summer range. They begin arriving at their breeding areas from April to mid-May, depending on how far they have to migrate (Michael and

Michael 1922, Bengtson 1966, Kuchel 1977, Wallen 1987). Males and non-breeding females stay less than eight weeks while nesting hens will remain for 16-18 weeks.

Birds distribute themselves along streams where pairs tend to show mutual avoidance of adjacent pairs. Bachelor drakes will often follow a pair around attempting to court the female. Groups larger than three are usually all nonbreeding birds. Nonbreeding hens comprise from 15% to 90% **of** the females on the breeding grounds (Bengtson 1972, Dzinbal 1982, Wallen 1987).

Females select their nest site from mid-May to late June and once incubation begins the pair bonds are broken. The incubation period is 29-30 days (Todd 1979). Clutch sizes range from 3-8 downy young (Bengtson 1972, Kuchel 1977, Wallen 1987). Hatching occurs from mid-June to late July. Young birds are flightless for about **six** weeks, at which time they begin departing the breeding grounds. Variations in weather, particularly during spring runoff, play an important role in the timing and success of any breeding season (Kuchel 1977, Wallen 1987).

Harlequins show a high degree of homing to the breeding grounds (Bengtson 1966, Kuchel 1977, Dzinbal 1982, Wallen 1987). In Wyoming, 50% of the marked adults returned to the same stream sections in successive years, and one young of the year banded in 1985 returned the following summer to raise a brood (Wallen 1987).

Harlequins have adapted very efficient methods for diving and feeding in swift currents (Pool 1962, Bengtson 1966). They also frequent shallow riffles where they probe among the stones

For food, these ducks feed on benthic insects on their breeding grounds (Bengtson and Ulfstrand 1971, Palmer 1976, Wallen 1987). Cottam (1939) found that stoneflies comprised 90% of two stomach contents taken in Wyoming.

STATEMENT OF THE PROBLEM

The needs of waterfowl often conflict with the interests of man. Declining waterfowl populations have been partially attributed to loss of habitat on the breeding grounds. Species with restricted habitat requirements or low reproductive potential have been the first to disappear (Delacour 1964). Frequently, areas which harbor harlequin ducks are also popular recreation areas.

Harlequin ducks in northern Idaho have been reported as uncommon summer occupants of remote headwater streams (Larrison et. al 1967, Burleigh 1972). Rust (1915) reported harlequins as rare in Kootenai County where a single specimen was taken on the St. Joe marshes at the head of Chatcolet Lake. He indicated that waterfowl numbers were lessened by the development of that area after 1906. Hand (1932) noted that harlequins were seen occasionally in May and June on the upper Lochsa but were not present every year. He felt they probably did breed in the area but had no record. Breeding harlequins have been documented on the St. Joe National Forest (Hand 1941), where they were considered rare summer residents on the upper St. Joe. Hand spent two summers in the upper reaches of the St. Joe and Little North Fork of the Clearwater but never saw any harlequins on the latter stream. These early reports can account for the presence of harlequins between May and early July, but exclude the brood rearing season and fledging portions of the

life cycle. No winter sightings of harlequins in northern Idaho have been reported.

Reese and Melquist (1985) compiled 52 records of harlequins sighted in Idaho. Sixty percent of those sightings were from northern Idaho (Appendix A). Several of these sightings were of breeding pairs during the nesting season.

Because of its apparent rarity and undisturbed habitat requirements, the harlequin duck is listed as a Sensitive Species by the Forest Service in Region 1. The purpose of this study was to determine the status and distribution of harlequin ducks on the Clearwater and Idaho Panhandle National Forests. The study area extended from the Canadian border south to the Lochsa River (Figure 2). The goal was to provide a better understanding of harlequin duck breeding habitat in northern Idaho. The objectives were as follows:

1. Attempt to locate harlequin ducks in the Selkirk Mountains, Cabinet Mountains, North Fork of the Clearwater drainage and the St. Joe drainage via field surveys.
2. Identify threats to continued harlequin existence in northern Idaho.
3. Determine management procedures necessary to protect harlequin duck habitat.
4. Validate previous sightings of harlequin ducks in northern Idaho.

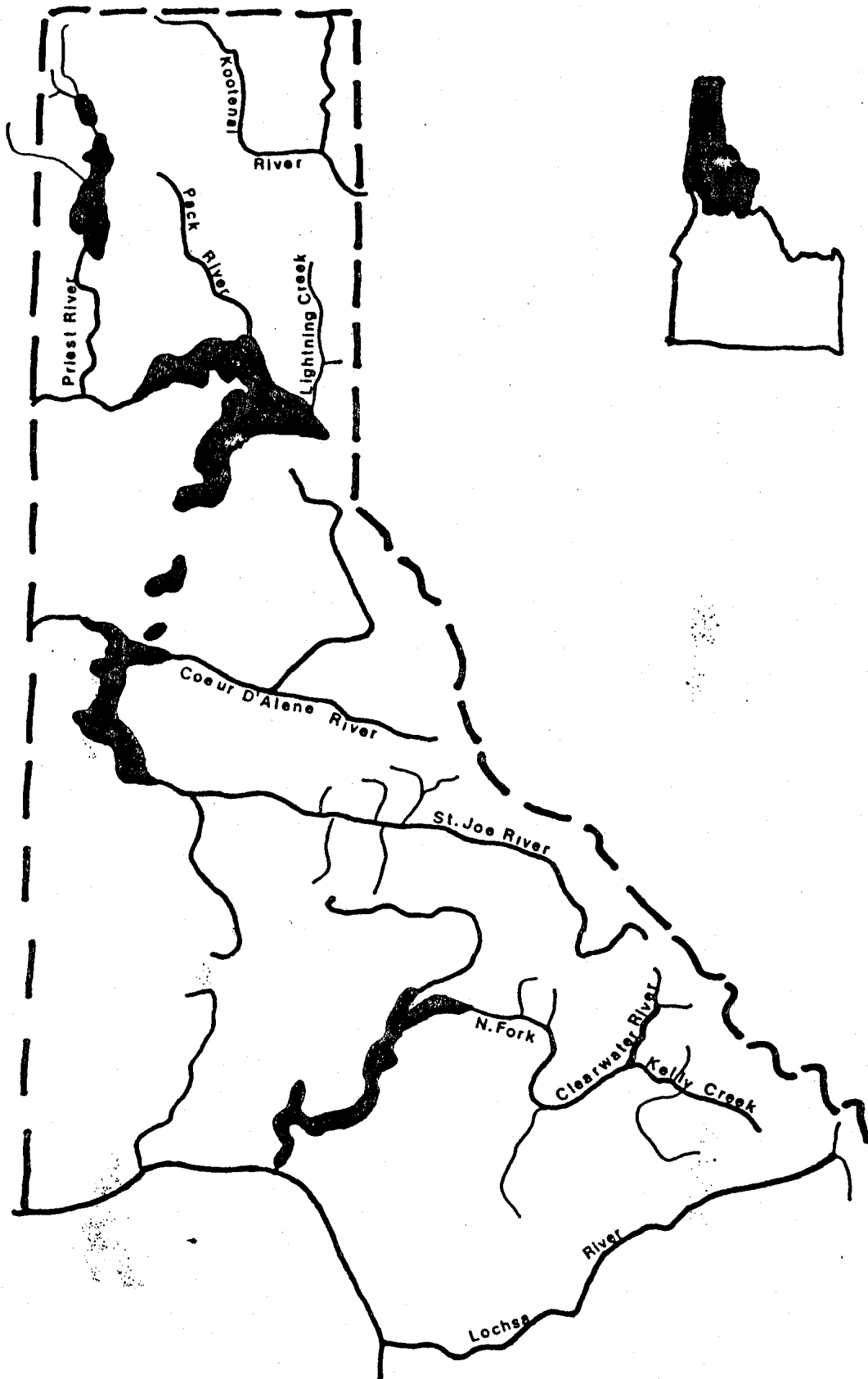


Figure 2. The major streams of the study area.

METHODS

During April 1987 an information seeking poster was distributed to U.S. Forest Service and Idaho Department of Fish and Game biologists throughout the study area. The poster described the purpose of the project and who to contact if any harlequin sightings were made (Appendix B). After distribution of the poster, a follow-up contact was made with Forest Service biologists throughout the study area. The timing of the field survey was planned using breeding season chronologies of harlequin ducks in Glacier and Grand Teton National Parks (Kuchel 1977, Wallen 1987).

Forest Service personnel provided lists of streams on the Clearwater and Idaho Panhandle National Forests that fit the habitat criteria necessary for nesting harlequin ducks. During the field survey, each of these streams were surveyed and evaluated for suitability using the following criteria:

- a) Low gradient stream sections (< 2 % slope) for nesting and brood rearing areas.
- b) Dense shrub vegetation lining the banks.
- c) Limited human activities.
- d) Stream channel braided.
- e) Water quality sufficient to support aquatic insects (especially Plecopterans).

During May and June, streams were surveyed by hiking or driving along the banks and searching for ducks with binoculars. In August, water levels allowed for hiking in the streambed.

Observations of harlequins were recorded on Special Animal Field Survey Forms (Appendix C). All sightings gathered were incorporated into the database of the Idaho Natural Heritage Program. Photographs were taken when conditions allowed.

RESULTS AND DISCUSSION

Thirty streams were surveyed for harlequin ducks (Appendix D). Six sightings of harlequin ducks were compiled during these surveys (Table 1). In addition, 14 sightings were reported to the Idaho Natural Heritage Program as a result of the poster (Table 2). Sightings occurred along eight different streams in Idaho and on one stream in Washington adjacent to the border (Figure 3). Young of the year birds were found only along the Lochsa and North Fork of the Clearwater Rivers.

Table 1. Sightings of harlequin ducks in northern Idaho by this study team in 1987

Date	Stream	Observation
5 May	Kelly Creek	Saw 2 pairs (possibly the same pair) T39N,R12E,Sec27,NW1/4
9 May	Crooked Fork	Saw 2-4 drakes. These birds were moving up and down the stream feeding. T37N,R14E,Sec11,SE1/4 and T37N,R14E,Sec14,NW1/4
7 Jun	Granite Creek	Saw a single hen drifting and feeding in the current. T37N,R45E,Sec12,SW1/4 (Washington)
10 Jun	Lochsa River	Saw one drake loafing on an island downstream of Wendover C.G. T37N,R13E,Sec35,NW1/4
29 Jul	Lochsa River	Saw an adult female and one young of the year feeding about 40m. apart. T37N,R13E,Sec35,NW1/4
1 Aug	N. Fork of Clearwater River	Saw two young of the year birds unattended by an adult. These birds were loafing on the downstream end of a gravel bar in an area where the stream was braided. T40N,R11E,Sec5,NE1/4

Table 2. Sightings of harlequin ducks in N. Idaho in 1987
turned in via the poster.

Date	Stream	Observation
2 May	Crooked Fork	Dick Kramer reported one drake at T37N,R15E,Sec6,SW1/4
	Crooked Fork	Dick Kramer reported a second drake at T37N,R14E,Sec14,NW1/4
7 May	St. Joe River	Craig Norris reported a pair downstream from Avery near the 2.5 mile mark on the road. T45N,R4E,Sec17,NW1/4
13 May	Squaw Creek	Dick Kramer reported a pair feeding in a pool. T37N,R13E,Sec31,NE1/4
14 May	Lochsa River	Dick Kramer reported a pair loafing on a gravel bar 4 miles downstream of Powell R.S. T37N,R13E,Sec35,NW1/4
14 May	St. Joe River	Craig Norris reported a lone drake downstream from Avery near the 2.5 mile mark. T45N,R4E,Sec17,NW1/4
16 May	Huff Lake	John Murnane and Bart Schleyer reported a pair on Huff Lake adjacent to Granite Creek. This sighting was in Washington near the Idaho border. T37N,R45E,Sec2
22 May	Hughes Fork	John Murnane and Bart Schleyer reported
23 May		a pair at Hughes Meadow.
26 May		T64N,R5W,Sec33
23 May	Coeur d' Alene River	Ned Horner reported a pair northeast of Cathedral Peak. T53N,R3E,Sec7
28 May	St. Joe River	Joel Okula reported a lone drake downstream from Avery near the 2.5 mile mark. T45N,R4E,Sec17,NW1/4
8 Jun	Gold Creek	Mark Engler and Dave Thorson reported a lone drake on Pend Oreille Lake at the mouth of Gold Creek. T53N,R1W,Sec3
Jun	Lochsa River	Dwight Kilgore reported a pair upstream of Wendover C.G. near milepost 159. T37N,R13E,Sec36

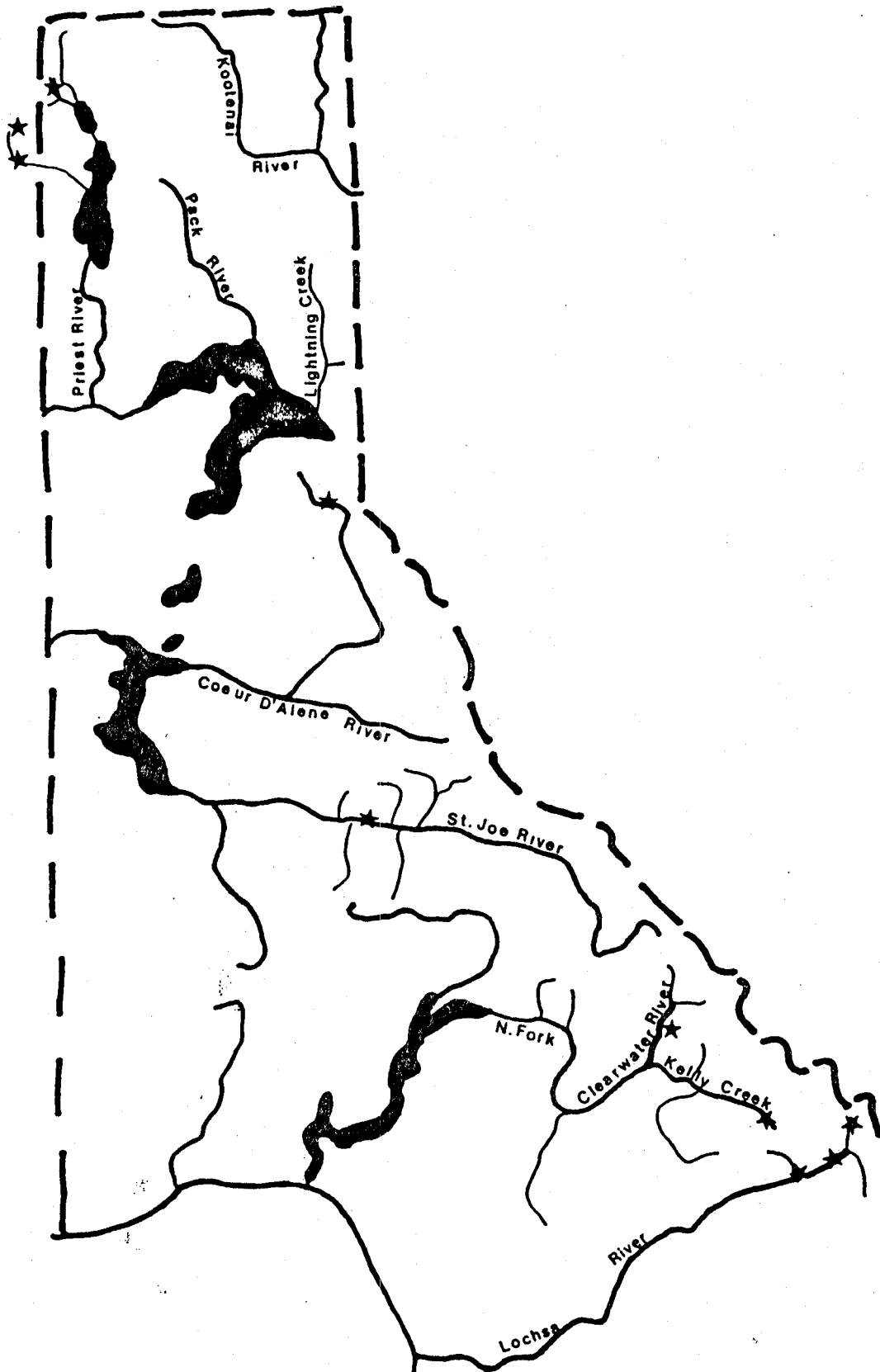


Figure 3. Harlequin duck sightings in northern Idaho for 1987. Stars indicate location of observations.

The timing of the field search is very important in determining the success of any survey for harlequin ducks. Sightings of harlequins in northern Idaho peaked in mid-May, with the latest observation of a drake occurring on 10 Jun. Two sightings of young of the year birds were made at the beginning of the brood survey in late July and early August. Observations on the Clearwater National Forest occurred at elevations greater than 985 meters above sea level. Harlequin duck sightings at the north end of the study area were at elevations less than 985 meters.

The timing of this survey, while producing only six observations, gathered valuable information about the chronology of harlequin duck activities in northern Idaho. Birds were observed on the Clearwater National Forest during the first week of May. Drakes and non-breeding hens probably departed the summer range by 15 Jun. Back-dating from estimated ages of juvenile birds, egg-laying occurred between 10-16 May and hatching occurred from 9-15 June. Young of the year birds were learning to fly during the first week of August.

It appears that egg-laying began shortly after breeding hens arrived on their summer range. Stream discharge was earlier in 1987 than in most years and probably caused the egg-laying activities to begin earlier. Wallen (1987) noted that egg laying began shortly after the peak of spring snowmelt in Grand Teton National Park.

Harlequin duck nesting habitat is scattered throughout northern Idaho. Fifty percent (15 of 30) of the streams surveyed in 1987 offered all four of the physical features of suitable

nesting habitat (low gradient, dense shrubs, braided channel and plecopteran aquatic insects). Forty-seven percent of these streams (7 of 15) were in areas where human disturbances were minimal. Two streams where harlequins are regularly sighted, the Lochsa River and Lightning Creek, are adjacent to well traveled roads. This makes it appear that driving along the banks might be less disturbing than water pollution or recreational activities which involve the human presence in the stream channel.

The St. Joe River drainage has many tributaries, which offer all four of the physical features of suitable nesting habitat. The St. Joe itself has historically supported nesting activities. This drainage has been heavily impacted by stream bank road construction, mining and recreational pressure (fishing, floating and swimming).

MANAGEMENT CONSIDERATIONS

Results of this preliminary survey suggest that harlequin ducks in northern Idaho nest in habitat similar to that found in Glacier and Grand Teton National Parks - relatively undisturbed, low-gradient, mountain streams with a healthy riparian component. This survey located sites where harlequin ducks are nesting and other sites where nesting is suspected. However, much remains to be learned about this species' status in northern Idaho.

Due to the small numbers of breeding harlequin ducks located and the scarcity of nesting habitat remaining in northern Idaho, we recommend that the harlequin duck remain as a Forest Service Sensitive Species. More information is needed to better identify nesting season chronology, and to quantify breeding success, production of young and amount of suitable habitat occupied. Once this information is gathered, management recommendations can be proposed.

Twelve stream sections were located during 1987 as valuable habitat to monitor for harlequin ducks (Table 3). It appears from the 1987 breeding chronology that the best time to survey for adult birds is from early May through the first week of June. Brood surveys should be most successful during the month of July. The northern portion of the study area should be surveyed earlier than the higher elevations in the south. Additional locations not surveyed in 1987 which should be evaluated for inclusion in Table 3 are:

- a) The upper meadows of Weitas Creek (CNF)
- b) Gold Creek (IPNF, Sandpoint District)
- c) North Fork of the Coeur D' Alene River
- d) Coeur d' Alene River downstream of Jordan Creek.
- e) Mica Creek (St. Joe River drainage)

Table 3. Locations to monitor for harlequin ducks.

CLEARWATER RIVER DRAINAGE	
Lochsa River	Upstream of Squaw Creek confluence
Kelly Creek	Upstream of Cayuse Creek confluence Between the old and newer Ranger Stations
N. Fork Clearwater River	Between the Hidden Creek Campground and the Diamond Camp
Little North Fork Clearwater River	Between the confluence with Canyon Creek and the confluence with Foehl Creek
ST. JOE RIVER DRAINAGE	
St. Joe River	Upstream of the Red Ives Ranger Station
N. Fork St. Joe	Upstream of Loop Creek
Marble Creek	Upstream of the Hobo hill bridge
PEND ORILLE LAKE DRAINAGE	
Lightning Creek	At the confluence of Strong Creek Near the confluence with East Lightning Creek
COEUR D' ALENE RIVER DRAINAGE	
Coeur d' Alene River	Upstream of Jordan Creek confluence
PRIEST RIVER DRAINAGE	
Granite Creek	Downstream of Huff Lake
Hughes Fork	Hughes Meadow
Upper Priest River	First two kilometers upstream of Upper Priest Lake

ACKNOWLEDGEMENTS

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APPENDICES

APPENDIX A

HARLEQUIN DUCK SIGHTINGS COMPILED BY REESE AND MELQUIST (1985)
FOR NORTHERN IDAHO

Month	Location	Observation
Spring	M. Gold Creek	Bill Davidson reported a breeding pair seen in late 1960's.
None	Gold Creek	P.A. Printz reported a breeding pair and 4-6 young in 1974, 1975 & 1977.
May 83 Fork May 84	Hughes	Jon Almack reported seeing a drake in the area until July each year.
Jul 72	Soldier Creek	Wayne Weseman reported a female.
None	Lion Creek	Wayne Weseman reported a female seen in the summer of 1977.
Jul 80	Priest Lake	Wayne Weseman reported 2 drakes.
None	Priest Lake	Mike McElhatton reported an individual bird on the lake in 1978.
Jun 82	Tepee Creek	Doyle Reynolds reported a drake and hen.
Fall	Coeur D' Alene River	Dwain Lowry reported seeing 1 pair in 1978 and 4 in a group in 1983.
May 85	Lightning Creek	Kathleen Fulmer reported a breeding pair in the turbulent water.
May	Lightning Creek	Earl Chapin reported seeing harlequins annually at confluence with Strong Creek.
Apr 82	Spring Creek	Paul Hanna reported a pair near the fish hatchery.
	Clark Fork River	Paul Hanna reported a pair in the Corp of Engineers drift yard on the north channel near Clark Fork, Id.
May 84	Lightning Creek	Paul Hanna reported a pair upstream of Clark Fork, Id.
None	E. Fork Lightning Creek	Dave Thorson reported seeing a breeding pair on several occasions over the years.
May 76	E. Fork Lightning Creek	Jack McNeel reported a pair on the rocks in mid-stream.

Month	Location	Observation
May 77 May 78	Lake Pend Oreille	Ward Tollbom reported a pair loafing in the open water and another pair swimming near shore.
None	Lower St. Joe River	Mike Gertsch reported seeing 2-3 pairs annually.
Jun 78	St. Joe River	Tracey Trent reported one adult.
Jul 82	St. Joe River	Wayne Weseman reported a hen. Don Johnson reported a pair.
None	N. Fork Clearwater River	Bob Jones reported a female with a brood of 5, but was unsure of the species.
None	N. Fork Clearwater River	Dwight Kilgore reported 1 bird near confluence with Washington Creek seen in spring 1977.
None	Kelly Creek	Dan Davis reported seeing harlequins annually near the old Kelly Creek Ranger Station.
Jun 84	Kelly Creek	W. Melquist reported a single drake on a sand bar near the Grasser Creek meadow.
None	Clearwater River	Mark Orme reported 2 individual birds between Orofino and Lewiston.
None	Dworshak Reservoir	Mark Orme reported 2 individuals.
Mar 73	Lochsa River	Mike Schlegel reported a pair near the nine mile rest area.
Mar 73	Lochsa River	W. Mullins reported a pair midway from Lowell and Lolo Pass.
None	Lochsa River	Paul Sommerfeld reported an unknown number of birds on the White Sand
None	Lochsa River	Tom Leege reported seeing a single bird on two occasions in his life.
May 85	Lochsa River	Jim Unsworth reported six individuals.

APPENDIX B

POSTER USED TO ADVERTISE THE RESEARCH EFFORT

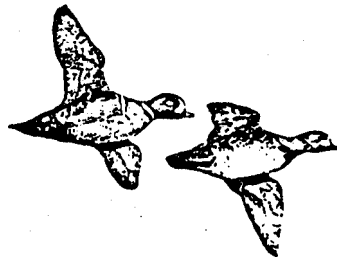


ATTENTION

WILDLIFE OBSERVERS

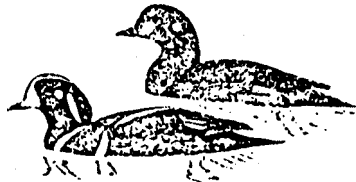
We need your help!

A field survey for **HARLEQUIN DUCKS** is being conducted in northern Idaho during the summer of 1987. This research is sponsored by the U.S. Forest Service in an attempt to determine the status and distribution of this uncommon species.

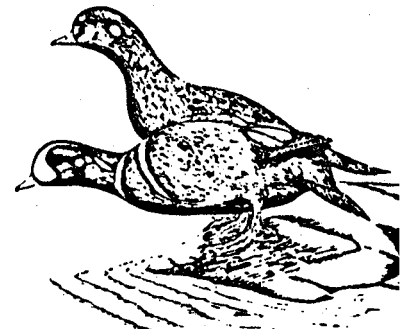


- Description:** Harlequin ducks are small sea ducks with rather bizarre plumage.-The drake is blueish-gray with rusty sides and various shaped white patches on the head and back. The hen is cryptic in color with a distinct white spot behind the eye.
- Habitat:** Harlequins breed along isolated mountain streams. They focus their breeding activities on low gradient stream sections (<5%) with perennial shrubs lining the banks. High gradient stream sections are used during migration because they offer security and a stable food source.
- Season of Use:** Drakes are most abundant in Idaho in May and June while breeding hens can be found here until mid September. Sporadic sightings do occur outside these dates.
- Sightings:** Report any current or past sightings to Craig Groves, Idaho Natural Heritage Program:

c/o Idaho Department of Fish and Game
4696 Overland Rd., suite 576
Boise, Idaho 83705
phone number 334-3402



harlequin ducks



APPENDIX C
SPECIAL ANIMAL FIELD SURVEY FORM

Map Code

Source Code

A. ANIMAL FIELD SURVEY FORM

Element Name: _____ Element Code: _____ Occ #:

Surveyor(s): _____ Date: _____ Time: _____ to

Weather: _____

State: _____ County: _____ Quad Name: _____ Quad code:

Repeat visit: Y,N Repeat visit needed: Y,N when:

EO Boundaries mapped: Y,N

Biology

Element Found? Y,N If not found, why?

Nature of observation: sight record; tracks; song; road kill;
collected specimen; other

Numbers observed: Numbers estimated: _____

Basis for estimate:

Age and Sex of individuals

Population trends from previous visit: more same fewer

Is species year-round resident on site?
breeding season resident only?
nonbreeding season resident only?
in passage on site only?

Evidences of reproduction at site:

Behavioral notes on observation:

Suggestions for what to look for on next site visit:

Habitat

Describe habitat:

Extent of this habitat in immediate area (approx. size):

Proportion of this habitat in immediate area apparently occupied by element:

Associated Natural Community/Plant Community:

Characteristic Associated species:

Conservation

Owner awareness of EO: Y,N Owner protecting EO: Y,N

Is this a site that will sustain the species more than a few years?

Evidence of disturbance to population and habitat:

Threats to EO:

How large an area is needed to provide species survival here?

SPECIAL. ANIMAL FIELD SURVEY FORM – page 3 Conservation/management needs:

Research needs:

Should this site be monitored for this species on a regular (e.g. yearly) **basis?** Why?

Data security: Y,N

Summary

EO Rank

EO **Quality**

EO Condition EO Viability

EO Defensibility

EO Rank

Specimen collection

If specimen(s) collected, how taken? Where deposited? Collection number _____

How familiar is the identifier with this species? (if identifier is someone other than surveyor, give name and affiliation):

Reference used in identification:

Photos taken: (list and describe)

APPENDIX D

LOCATION OF SITES SURVEYED DURING 1987

Name of Stream	Date	Surveyed From	Surveyed To
Fish Creek	1 May	T35N,R9E,Sec32	T35N,R9E,Sec19
Lochsa River	20 Apr T37N,R14E,Sec34 May 9 May* 10 Jun*		T32N,R7E,Sec4 1
	28 Jul* 29 Jul	T37N,R14E,Sec34	T36N,R13E,Sec5
Crooked Fork	20 Apr 1 May 9 May 28 Jul	T38N,R15E,Sec32	T37N,R14E,Sec34
Skull Creek	2 May	T40N,R8E,Sec8	T41N,R9E,Sec20
Weitas Creek	3 May	T38N,R8E,Sec15	T37N,R8E,Sec10
Quartz Creek	4 May	T40N,R8E,Sec16	T40N,R9E,Sec5
Kelly Creek	5 May 7 May 8 May 31 Jul 1 Aug 2 Aug	T39N,R10E,Sec18	T39N,R11E,Sec16
Kelly Creek	5 May* 1 Aug	T39N,R11E,Sec16	T39N,R12E,Sec26
Cayuse Creek	7 May 1 Jul 30 Jul	T39N,R11E,Sec35 T38N,R13E,Sec28	T8N,R11E,Sec18 T37N,R12E,Sec5
Independence Creek	8 May 1 Aug	39N,R11E,Sec16	39N,R11E,Sec16
N. Fork Clearwater River	3 May 4 May 8 May 1 Aug* 2 Aug*	T41N,R6E,Sec27 T39N,R10E,Sec18	T39N,R10E,Sec18 T41N,R11E,Sec28
Long Creek	2 Aug	T41N,R11E,Sec28	T41N,R11E,Sec1
N. Fork St. Joe River	10 Jun 3 Aug	T45N,R5E,Sec11	
Slate Creek	10 Jun	T47N,R4E,Sec28	T47N,R4E,Sec36
Loop Creek	10 Jun	T46N,R6E,Sec8	T46N,R6E,Sec12

Name of Stream	Date	Surveyed From	Surveyed To
Little N. Fork Clearwater River	11 Jun	T42N,R6E,Sec23	T43N,R5E,Sec6
Big Creek	12 Jun	T45N,R3E,Sec5	T46N,R3E,Sec6
Marble Creek	12 Jun	T45N,R3E,Sec13	T44N,R3E,Sec28
Fishhook Creek	11 Jun	T45N,R5E,Sec17	T44N,R5E,Sec19
St. Joe River	9 Jun 13 Jun 14 Jun 15 Jun 2 Aug 3 Aug	T46N,R2W,Sec14	T43N,R10E,Sec21
Coeur D' Alene	7 Aug	T53N,R3E,Sec17	T53N,R2E,Sec4
Lightning Creek	3 Jun 4 Jun 6 Aug	T55N,R2E,Sec3	T58N,R2E,Sec26
East Fork Lightning Creek	3 Jun	T57N,R3E,Sec32	T57N,R3E,Sec27
Pack River	4 Jun	T60N,R2W,Sec34	T60N,R2W,Sec5
Moyie River	5 Jun	T64N,R2E,Sec2	T63N,R2E,Sec13
Granite Creek	6 Jun 7 Jun* 5 Aug	T62N,R5W,Sec33	T37N,R45E,Sec2 (Washington)
Gold Creek	6 Jun	T63N,R5W,Sec17	T63N,R5W,Sec9
Hughes Fork	6 Jun 7 Jun 4 Aug 5 Aug	T64N,R5W,Sec29	T63N,R5W,Sec13
Priest River	7 Jun 5 Aug	T64N,R5W,Sec15 T63N,R5W,Sec2	T65N,R5W,Sec22 T63N,R5W,Sec12
Soldier Creek	8 Jun	T59N,R4W,Sec2	T60N,R3W,Sec31
Middle Fork of East River	8 Jun	T58N,R4W,Sec14	T58N,R3W,Sec10

* - indicates that harlequins were located on these dates

Submitted by:

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