Aerial Surveys for Harlequin Ducks in Northern Labrador

August 1987

R. I. Goudie

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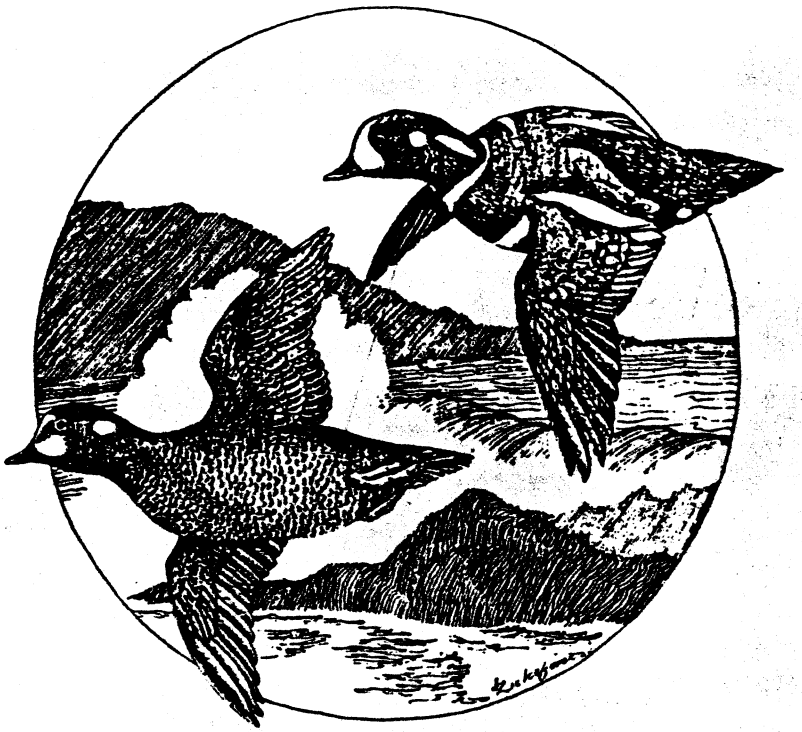

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Newfoundland
October 1987

Methods

Surveys were conducted using a Jet Long Ranger helicopter with fuel extender, and encompassed areas from Nachvak Fiord south to Nain area. Areas were selected within this zone based on historical evidence of the presence of species of primary concern as well as topographical and habitat features that were deemed potentially suitable.

Surveys often involved the examination of south-facing precipitous slopes in river valleys with coverage of rivers/streams subsequently. Harlequin Ducks were easily observed from helicopter when passing over center of water course at 15-25 m altitude at ~~reduced~~ speeds of 110 kph. Based on historical data on broods of Harlequin Ducks in northern Labrador, the survey in early August was felt suitable timing to detect broods in the mid-developmental stages (Class 2a - 2c; after Gollop and Marshall, 1954). Females without broods were found to flush readily on close approach by helicopter whereas ~~hens~~ birds with broods generally exhibited distraction behaviors.

Results

A total of 81 female (or subadult?) Harlequin Ducks was observed during coverage of 474 km of rivers and streams [Figure 1] (lakes and ponds excluded) [Table 1]. Only 4 broods were observed, ~~and these were~~ all in mid-developmental stages. The data suggested extensive non-breeding in northern Labrador this year.

There was no clear pattern of river use by Harlequin Ducks as some seemingly suitable rivers were lacking birds whereas other seemingly minor streams supported birds. Observations of singles or small assemblages of 1 to 5 female Harlequin Ducks occurred near river mouths and up to 60 km inland. Some groups of 4 to 5 were associated with smooth meandering estuaries atypical of the expected habitat of breeders along rapids and riffles. Two particularly large groups of 11 and 13, respectively, were located near the mouths of rivers and typical of concentrations of immatures and/or non-breeders noted in other studies (e.g. Bengtson, 1972).

Considerable numbers of other waterfowl were observed, especially noteworthy were molt concentrations of Canada Geese, Black Ducks, eiders and scoters (Table 2). Raptor observations were highlighted by Peregrine Falcons and Golden Eagles (Table 3).

Discussion

Our surveys confirmed the presence of significant numbers of Harlequin Ducks along rivers and streams in northeast Labrador. Coverage within surveyed water systems was felt to be (reasonably?) complete as Harlequin Ducks were readily observed. The observations indicated a density of approximately 0.1 indicated breeding pairs per km of river which is considerably lower than reported

~~densities~~ in the other disjunct areas of the species' ~~subarctic~~ range where 1 pair/km of river is an average density, ~~with~~ over 7 pairs/km of river being the largest reported concentration (See Bengtson, 1972; Dzinbal 1982; Kochel, 1977; Kistschinsky, 1968). Obviously, the reported present scarcity of this sea duck on its northwest Atlantic wintering grounds (Vickery, 1988) is also reflected in its uncommon occurrence on the breeding grounds.

The Harlequin Duck exhibits extensive non-breeding, apparently attributed to frequent scarcity of available foods on the breeding grounds (Bengtson 1972; Bengtson and Ulfstrand, 1971; Dzinbal, 1982, i.e., average of 44% non-breeding annually), Only four broods of Harlequin Ducks were observed in the surveys of northern Labrador. These broods were in the mid-developmental stages, i.e., class 2 after Gollop and Marshall 1954, so it is unlikely that many Harlequin Ducks had not completed incubation or juveniles had fledged. Rather, it indicated a year of extensive non-breeding by adult females (~90%) in northern Labrador, a level also reported for some years in Iceland exceptionally early spring and lack of rainfall (Labrador Inuit Association, pers. comm.) This may have reduced available foods for Harlequin Ducks.

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The 1987 aerial surveys of northern Labrador provided the first systematic data on the distribution of the eastern North American population of Harlequin Ducks breeding in northern

Labrador. The low overall abundance recorded here is reason for concern because it supports the corresponding scarcity of this species on the winter grounds where it was far more numerous in the past (Phillips, 1925). The deferred maturity (2-3 years) and extensive non-breeding by this sea duck results in its increased susceptibility to population declines if high adult survival rates are not assured.

The success of theses aerial surveys supports the feasibility of expanded surveys of the Harlequin Duck's breeding range in eastern North America. Future efforts can develop a systematic survey to monitor representative sectors of its range.

Acknowledgements

Special thanks to Dave Lemon for ~~avidly~~ pursuing funding for this study, and to ~~the support of~~ World Wildlife Fund, ~~which~~ made possible this cost-shared survey. Further appreciation to World Wildlife Fund for their foresight in taking an interest in the status of Harlequin Ducks in eastern North America.

(Bengtson and Ulfstrand, 1971; A. Gardarsson, pers. comm). Water levels were extremely low in this area apparently because of an

This survey was ~~especially~~ successful because of the expert flying skills and keen eye of Geoff Goodyear, air pilot for Universal Helicopters. Those cliffs and deep ravines certainly test the middle ear of the most experienced flyers!

Further thanks to Stu Luttich for great hospitality and conversation at the old "Primogenitor Camp", Hebron Fiord.

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Table 1 - Observations of Female Harlequin Ducks in Northern Labrador, 30 July - 6 August 1987

R. Name (area surveyed-Waterfowl)	Drainage area (km²)	mean width	axial length	Basin Relief	Length Meander Main Stem	Tributaries Total Length	Tributaries No. of	Cover-age	Geol. Form.	Distance to first Barrier (km)	pH	Specific Conductivity	Alk. (PPM)	Turbidity (JTU)	Harlequin Duck Observ No.	
Hebron Fiord River #104 Black Bark R.	1461	16	73	671	37	444	16	10	Gneiss	33.8 (11,345)	6.2	17.0	3.0	0.7	3♀	Smooth, very few boulder little veg.
Primogenitor R. River #105	1347	21	73	763	76	481	54	18	Gneiss	43.5 (1,556)	6.4	20.0	4.0	0.4	nil	relatively smooth with few boulders
Ikarut R. River #106	474	13	40	458	37	140	11	35	Gneiss	33.8 (2,675)	nil	nil	nil	nil	nil	very braided
Golden Eagle Br. River #103	790	11	73	793	81	269	22	8	Gneiss	30.6 (2,420)	6.0 6.6	19.0 22.0	3.0 4.5	0.9 1.0	nil	
Saddle Br. (Little Ikarut R.)	-	-	-	-	-	-	-	7	-	-	-	-	-	-	1♀	
Winnie Bay Br.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	nil	
Kameplain Br.	-	-	-	-	-	-	-	10	-	-	-	-	-	-	nil	
Saglek Fiord Kiyuktok River #107	86	5	16	305	16	32	4	5	Gneiss	n/a	-	-	-	-	1♀, 1♀	
Pangertok Inlet Br. River #108	278	10	27	458	21	71	7	1	Precambrian sediments & volcanics		-	-	-	-	2♀	
S. Ugjuktok F.R.	212	11	27	763	37	94	9	10	Gneiss	20.9 (8,279)	6.4	20.0	4.0	0.9	nil	

Table 1 - Observation of Female Harlequin Duck in Northern Labrador, 30 July - 6 August

R. Name (area surveyed-Waterfowl)	Drainage area (km)	mean width	axial length	Basin Relief	Length Meander Main Stem	Tributaries Total L.	No. of	Cover-age	Geo. Form.	Distance to first Barrier (km)	Ph	Specific Conductivity	Alk. (PPM)	Turbidity (JTU)	Harlequin Duck Observ No. Comments
N. Ugjuktok F.R. River #10	168	10	21	763	26	68	9	12	Gneiss	16.1 (1,098)	-	-	-	-	nil
S. West Arm R. River #111	707	11	48	915	58	280	33	3	Gneiss	35.4 (15,308)	5.6	5.0	<1.0	0.4	4♀
Nakvak Br. River #113	844	16	48	915	64	219	39	18	Gneiss	17.7 (2,678)	6.1 6.6 6.6	16.0 26.0 18.0	2.0 7.0 3.0	0.2 3.0 0.3	nil excellent
Kangalasoirvik Br.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2♀ on coast off mouth
East Pangertok Inlet Br.	-	-	-	-	-	-	-	6	-	-	-	-	-	-	nil
Little Ramah Br.	-	-	-	-	-	-	-	10.5	-	-	-	-	-	-	2♀
Rowsell Harbour Br.	-	-	-	-	-	-	-	6	-	-	-	-	-	-	nil
Delabarre Br.	-	-	-	-	-	-	-	4.5	-	-	-	-	-	-	nil
Cladonia Br.	-	-	-	-	-	-	-	2.75	-	-	-	-	-	-	nil
Takkutat R.	-	-	-	-	-	-	-	7	-	-	-	-	-	-	nil
North Napaktok Br.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1♀
South Napaktok R.	-	-	-	-	-	-	-	11	-	-	-	-	-	-	nil
Lost Chan Br.	-	-	-	-	-	-	-	3	-	-	-	-	-	-	nil

Table 1 - Observation[2] of Female Harlequin Duck[2] in Northern Labrador, 30 July - 6 August

R. Name (area surveyed-Waterfowl)	Drainage area (km)	mean width	axial length	Basin Relief	Length Meander Main Stem	Tributaries Total L.	No. of	Cover-age	Geo. Form.	Distance to first Barrier (km)	Ph	Spec-ific Conduct-ivity	Alk. (PPM)	Turb-idity (JTU)	Harlequin Duck Observ No. Comments
OKAY BAY Siuqak Br.	-	-	-	-	-	-	-	40	-	-	-	-	-	-	4♀ (estuary) 1♂,5♂,1♀,1♂,2♂
Sipukat Lake Inlet Br.	-	small, marshy, and shallow				-	-	8	-	-	-	-	-	-	-
Sipukat Outlet Br.	-	-	-	-	-	-	-	2.5	-	-	-	-	-	-	1♀ (estuary)
North River	-	-	-	-	-	-	-	21	-	-	-	-	-	silty	2♀
Falsa Br. (Tributary off N. River)	-	-	-	-	-	-	-	13	-	-	-	-	-	-	nil very smooth
-															
Avakutak Bay Avakutak R.	-	-	-	-	-	-	-	20	-	-	-	-	-	-	excellent habitat 1♀
-															
Tasiuyak Bay Tasiuyak R.	-	-	-	-	-	-	-	21	-	-	-	-	-	-	11♀ estuary, 1♀ 1+ 5class2(b),3♀
Port Manvers Run N. Man of War Br.	-	-	-	-	-	-	-	6	-	-	-	-	-	-	2♀
Webb Bay Webb Br.	-	-	-	-	-	-	-	17	-	-	-	-	-	-	nil, relatively smooth
Lister Br.	-	-	-	-	-	-	-	1.5	-	-	-	-	-	-	nil

Table 1 - Observations of Female Harlequin Ducks in Northern Labrador, 30 July - 6 August

R. Name (area surveyed-Waterfowl)	Drainage area (km)	mean width	axial length	Basin Relief	Length Meander Main Stem	Tributaries Total L.	No. of	Cover-age	Geo. Form.	Distance to first Barrier (km)	Ph	Spec-ific Conduct-ivity	Alk. (PPM)	Turb-idity (JT4)	Harlequin Duck Observ No.	Comments
Tikkoatokak Bay - Tikkoatokak Rapids	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	13♀, 3♀	
Kingurutik R.	-	-	-	-	-	-	-	55	-	-	-	-	-	-	1♀, 5♀	
Little Kingurutik-Br.	-	-	-	-	-	-	-	6.5	-	-	-	-	-	-	2♀ + 2 Class 2(b)	
Anatalik R.	-	-	-	-	-	-	-	61.5	-	-	-	-	-	-	1♀ + 4 class 2(a)	
Kamanatsuk R.	-	-	-	-	-	-	-	10	-	-	-	-	-	-	2♀ + 4 class 1(c) 1♀	
TOTAL	Coverage: 474.3 km; Observations: 81 females + 4 broods, as 12 singles + 6 with 4 broods, 6 groups of 2,3 groups of 3, 2 groups of 4, 2 groups of 5, 1 @ 11, 1 @ 13.															

Table 2 - Other Waterfowl Observations, Northern Labrador - 30 July - 5 August 1987

Route	Coverage	Canada Geese	Golden-eye	Others	Group	Black Duck	Green-winged	Coverage	Old Squaw	Common Loon	Red-breasted Merganser	Other
Goose Bay enroute Hebron Fiord via Moon Base Alpha 30 July 1987	not surveyed per se	12 (no prim dev) 4 class 2a (S. of North R.)	5,5	40 (south of Kanairiktok River)	-	24 (south of Lameplain R.)	-	not surveyed per se	1♀ + 4 (class3) 3	1 pair 1 pair 1 pair	1♀,1♀,1♀ 1♀,1♀,1♀ 1♀ 14	2 herring gulls
Hebron Camp Area 30 July 1987	-	-	-	-	-	2 (30-07-87) 24 (Black Bark R. delta) 70 (Ikarut estuary)	-	-	-	-	1♀,1♀(8-2b)	1 herring gull
Saglek Area	-	-	-	-	-	-	-	-	-	1 pair + young	-	-
Kijuktok	-	8+10 class 2	-	-	1♂ (lesser)	1,1 + 2 class 2a	2,2,1	-	-	-	-	-
Estuary	-	2, (13+16) +16-1c) 3,9+16)(2b)	-	-	-	-	-	-	-	-	-	
Kijuktok Cove	-	6, 30, 1	-	-	-	12	-	-	-	-	-	-
Pangertok Inlet	-	55,(5%flightless) 17 (f)		-	-	14, 11 (molt) 12, 5		-	-	-	-	-
Pangertok R. (east)	-	24 (some (f)) 20 (prim 2/3)	-	-	-	-	-	-	-	-	-	-
Pangertok Inlet (west)	-	50, 35 (near flying)	-	-	-	-	-	-	-	-	1♀	
Ujoktok Fiord W. Arm	-	-	-	-	-	-	-	-	-	-	6, 6, 1♀, 3,	-
Little Jens Haven Island	-	-	-	400 scoters molt-mostly surf+some WW 200,100 eiders molt	-	-	-	-	-	-	20	30 herring gulls
Shuldham I.	-	-	-	70, 3(m) eiders 85(f) eiders(80%)	-	40(f)	-	-	-		5, 8	

Table 2 - Other waterfowl observations, Northern Labrador - 30 July - 6 August 1987

Route	Cover-age	Canada Geese	Red-breasted Merganser	Golden-eye	Eider, Scoter Other	Black Duck	Teal	Common Loon	Black Guille-mot	Great Black-backed Gull	Herring Gull	Iceland Gull	Large Gull	Other
Nachvak Brook Delta	-	-	12(molt)	-	-	5	-	-	-	-	-	-	-	-
Upper L. Raman Brook Water Shed 31 July 1987	-	45(late molt)-6,11+14(2a)	-	-	-	-	-	-	-	-	-	-	-	-
Little Raman Bay	-	-	-	50(molt)	-	-	-	-	-	-	-	-	-	-
Raman Bay	delta not surveyed		1 pair		10, 3 eider 30(f mostly)	-	-	-	-	-	-	-	-	-
Reddick Bight	-	-	-	-	120(f mostly)	-	-	-	1	-	-	-	-	-
Rowsell Hr.	-	40(molt)	1	25(molt) 8	-	12(f)	-	-	-	-	-	-	-	-
Nachvak Fiord (small portion)	-	-	20(molt)	-	-	12	-	-	-	-	-	-	-	-
Mouth of Raman to Duckin Point	-	-	-	-	70(f)eider 20,5(f) 150(f)	-	-	-	-	-	-	-	-	-
Rachad Head	-	-	-	-	250, 150, 600, 120, 250, 1200	-	-	-	-	-	-	-	-	-
to Bear Gut	-	-	-	-	25, 25, 25, 1, 8, 15, 30, 500	-	-	-	-	-	-	-	-	-
to Saglek	-	-	-	-	500, 50, 175, 100, 6, 50, 100, 10, 150, 70, 15, 15	-	-	-	-	-	-	-	-	-
Saglek to Hebron	-	25(late molt)		-	37 eider scoter-200, 125	- 4	-	-	8,1, 6,8,	-	-	-	-	Rock Ptarmigan
Hebron(Jerusalem Cove)		75(25%flying)		-	scoter-5,20,	-	-	-	-	-	-	-	-	-
Hebron Proper	-	3(molt)	-	-	eider-7 7,40,8, scoter-4 70,3(m) eiders 40(f)	-	-	-	-	-	-	-	-	-

Table 2 - Other Waterfowl Observations, Northern Labrador - 30 July - 6 August 1987

Route	Coverage	Canada Geese	Red-Breasted Merganser	Golden-eye	Eider, Scoter Other	Black Duck	Teal	Common Loon	Black Guillemot	Great Black-Backed Gull	Herring Gull	Iceland Gull	Large Gull	Other
Minnie Bay Hebron	-	70(60%flying) 8	-	-	-	-	-	-	-	-	-	-	-	-
Takutat Inlet	-	10, 12	-	-	-	7	-	-	-	-	-	-	-	-
Illuverkalik I.	-	-	-	-	1, 10(9)	-	-	-	-	-	-	-	10,2	-
White Bear I.	-	-	-	-	-	-	-	-	15	-	1	-	1,1,1	-
Hugford Bay	-	-	-	-	50	-	-	-	50	-	-	-	-	-
Ringnetuk I.	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Okak Island	-	-	-	-	-	-	-	-	2	2	-	-	2 42	-
Cutthroat I. (off Okak I.	-	20(f)	-	-	-	3,2	-	-	250	-	-	-	1	-
Moose I. Tickle	-	-	-	-	-	25	-	-	-	-	-	-	2	-
Nutak Tickle	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Siugak Brook	-	8,3,10(all molt) one with yellow neck collar	3,1,1	-	-	9	-	-	-	-	-	-	-	-
Sipukat Lake Inlet Brook	-	-	5	1+4(2c)	-	-	-	-	-	-	-	-	-	-
Inner Okak Bay	-	70,100,12 (mostly(f))	3,1	8,1	-	125(molt-adjacent pond) 20,1,7,30		5	-	-	-	-	-	-
North River	-	12(m)	5,4(m) 13,1	-	-	2(m)	-	-	-	-	-	-	-	-
Upper Suigak River		42(late molt) 22,75(m)	2,2	-	-		1♂(m) 2♀(m)	-	-	-	-	-	-	-

Table 2 - Other Waterfowl Observations, Northern Labrador - 30 July - 5 August 1987

Route	W. W. Duck	Canada Geese	Red-breasted Merganser	Golden-eye	Eider, Scoter Other	Black Duck	Teal	Common Loon	Black Guille-mot	Great Black-Backed Gull	Herring Gull	Iceland Gull	Large Gull	Other
Black Duck Br.	-	50(late molt)-13,20,6+2)down)		-	-	-	-	-	-	-	1,1,1 2,1	-	-	-
Seall Brook (sw) from Lake into Napoktok Bay		-	-	1	-	-	-	-	-	-	1	-	-	--
Little Ikarut R.- 3 Aug 87		-	1	-	-	-	-	-	-	-	-	-	-	-
Ujoktok Br.	-	-	1	3	-	150(delta)		-	-	-	-	-	-	-
Ikarut R.(upper)	-	-	-	-	-	20	-	-	-	-	2	-	-	-
Ubivak Point to Nutak 4 Aug 87	4	-	5	-	15,1	8	-	-	1,1	1	1,2,1	-	-	-
to Anakutak R.	-	20,28,42, 6(m) 55(f),75	4 50(m) 40,4	-	surf sc-100-200 50,possibly others eider-25,4,8	1.3,5,2		-	-	1,1	1,1 1,1,3	-	-	2 6ui drs 15ui dks
Avakutak Bay	-	-	-	-	-	10(m),6,2 6(+1 mallard)		-	-	-	-	-	-	1♂ mallard
Avakutak R.	-	12	4,1♀,1♀ 1♀+brood 1♀, 1♀	-	-	3	-	-	-	-	-	-	-	-
Webb Br.	-	5+2gosling	1♀+3(1b) 6	-	-	3♀mallard(m)		4	-	-	1,1,1 2	-	-	2 gr scaup 3♀ mallard
Webb Bay	-	-	-	-	-	25	-	20,1,1	-	-	-	2,1	-	-
Conch Bay 4 Aug 87	-	-	-	-	-	-	-	-	-	-	1 pr	-	-	6 ui dks
Nain Bay	-	-	-	-	-	45,4,2,1,b		-	2,1,1	1,1	1,3,5 2,1,1	-	-	-
Nain	-	-	-	-	-	-	-	-	-	-	3,5	1	-	-
Tikkoatokak Bay	-	-	-	3	-	-	-	-	-	-	1 pr	1	-	-

Table 2 - Other Waterfowl Observations, Northern Labrador - 30 July - 6 August 1987

Route	W. w. Duck	Canada Geese	Red-breasted Merganser	Goldeneye	Eider, Scoter, other	Black Duck	Teal	Common Loon	Black Guillemot	Great Black-backed Gull	Herring Gull	Iceland Gull	Large Gull	Other
Kingurutik R.	-	-	-	-	-	-	-	-		1	-	-	-	-
Little Kingurutik River		-	1♀+brood 1♀	-	-	-	-	-	-	-	3	-	-	pine siskins
Main to Port	-	11(f)	-	-	40(eider)	-	-	-	-	1,2,	1 pr	-	-	-
Manvers Run 5 Aug 87	-	-	-	-	-	-	-	-	-	25	2,75 2,12 6,1,1	-	-	-
To Kiplapait Mtns. to Tasiuyak Bay		-	-	-	30, 100+scoter	31	-	-	-	1,2 1,2	2,1,4 19,3 1,1,2 1,1	-	-	-
Tasuiyak R.	-	3(m)	2♀,3♀, 1♀,2(c) 4♀	1	-	3(m)	-	3 1nest 1 egg	-	-	- 1	-	-	-
Main to Anaktalik River 6 Aug 87		30(f),40(m) 45(f)	-	-	-	3,24,10,5,3		-	-	1,2	12,1	-	-	2♀,yellowleg
Anaktalik R.	-	-	2♂,1♂ 1♀ +2(2b)	1♀+4(2c)	-	1	-	-	-	-	-	-	-	-
Onto plateau then to eeyrie then Moon Base Alpha		7	-	-	-	-	-	-	-	1	-	-	-	-
Grand Total	44	1431 + 64 gosling (late downy stage)	312 + 6 broods (class 1b -2c)	108 + 2 broods (class 2b 2c)	6,199 eider 1,204 scoter (mostly surf some ww)	919 (incl. 4 mallards)	39	14+2nest + 1young		347	54	249	68	-

Footnote: (f) - capable of flying
(m) - flightless molt

Table 3 Raptor Observations, Northern Labrador - 30 July - 6 August 1987

Route	Red-tailed Hawk	Rough-legged Hawk	Peregrine Falcon	Gyr-Falcon	Golden Eagle	Raven	Other
Enroute Hebron Fiord via Moon Base Alpha (not survey per se) 30 July 1987	1	1,	1 (Cathedral Hills) Hebron Fiord nest + 3 (<10 days old) male returned Primogenitor Lake delta				
Primogenitor River			nest + 2 (5 weeks old) Iterungnek Fiord				
Saglek Fiord		1,1,1 nest+2 (3.5-4wks old) 1,					
Pangertok River		nest + 2(3wks old)					
Pangertok Inlet (west)				1 (grey ph)			
Little Ramah Brook		1 nest+3(4-5wks old) 1,					
Little Ramah Bay		1 nest + 3(4-5wks old) 1,					
Ramah Bay		nest + 2(4-5wks old)		1 pr(grey ph) North Hd.			
Saglek to Hebron			1 (Mainland adjacent to Maidmonts I.) 1Ad° (near Cape Nuvotannak)				
Hebron Proper		1,1,pr,1					
Winnie Bay, Hebron Fiord 1 August 1987		1					
Grimmington Island		1 (dark)					
White Bear Island		1					
Uyagaksuyulik Bay		1	1 pr.				
Nutak		1	1 pr?				

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Okak Harbour		1					
Kingnetuk Island						2	humpback
Staebang Bay		1 pr					
Nutak Tickle			1 broody ♀ later joined by ♂ also 2 chicks 3-4 wks.				
Ubivak Pt.		1					1 merlin
Sipukat Lake Br. Estuary							
Black Duck Brook		1,1(possible pr) 1 nest @ 2 young					
SW Brook from lake into Napoktok Bay (proper)		1,1		1 adult (grey)		3	
Ikarut River (3 Aug 1987)		1 (upper)			1 pr (lower)		
Nutak to Avakutak R.						5	
Webb Brook							1 osprey
Tikkoatokak Bay						2	
Nain Bay				1 grey phase		1,1,1,2,1	1 goshawk
Tikkoatokak Bay					1 (imm)		1 merlin(o)
Kingurutik Lake							1 merlin
Kingurutik River					1 pr + nest 1 eaglet, 2 imm, 1 imm		1 pr merlin
Little Kingurutik R.		1			nest + 2 eaglet ~9wks, 1 imm, 1 sub		

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Nain to Port Manvers Run (5 August 1987) to Kiplupait Mts. to to Tasiuyak Bay				1 grey phase Island near Nain	1 adult 1 imm	1	
Anaktalik River (6 August 1987)							1 Osprey + nest
Onto Plateau to Eeyrie then moon base alpha (not survey per se)							1 pr merlin
Total	1	23 + 6 nest with young 3-5wks old	9 adults + 3 nest sites with chicks 10 days old to 5 wks old 1 pr very broody but no nest found	1 pair + 4 adults	2 pairs + 2 active nests 6 imm, 1 subadult	28	2 osprey + + nest 1 goshawk 2 pr + 3 merlin