

## Introduction

The first waterbird counts in the Keweenaw were conducted by the late Laurence Binford at Agate Harbor (between Eagle Harbor and Copper Harbor). The vast majority of ducks, loons and grebes passing his count site were moving east. At Binford's suggestion I started doing short counts at sites farther SW along the Keweenaw shoreline and a site I soon visited was the Freda site. The count at Freda this year is largely the result of those sporadic counts I've done at Freda since the year 2001. As early as 2004 it was clear that there were significant numbers of birds passing SW at Freda while the majority went NE. The goal of this year's ambitious count program was twofold: one – to get a full season of migration data from Freda to enable comparison to the full season count done at Hebard Park in 2014, and two – to compare day to day counts between Freda and Hebard by having a second count of approximately one month conducted at Hebard. Hopefully the simultaneous counts would help us get a clearer understanding of the complexities of waterbird migration along the Keweenaw shoreline.

## Methods

A three-month count was conducted at the old Champion Stamp Mill site at Freda approx. 11 miles west of Houghton, Michigan. The count was conducted for 8 hours each day beginning at sunrise. The count ran from 15 August through the 15<sup>th</sup> of November. The hired counter was Louie Dombroski who counted six days each week with the seventh day being covered by Joseph Youngman. Binoculars and spotting scope were used to help identification. The total count hours were 714.5 with an average of 7.68 per day. Several days shortened by bad weather were almost made up for by Louie counting extra hours on days with good movement. For strictly comparing this count to other 8 hour counts it needs to be pointed out that on 11 days the official count at Freda went over 8 hours.

The priority of the count was to census migrating waterbirds but all species were recorded. The count was paperless, with all data being recorded on a Samsung tablet computer using software from Dunkadoo. Using this system, we recorded the following weather data hourly: wind speed, wind direction, temperature, Percent of cloud cover, visibility, precipitation and barometric pressure. Bird data recorded included: numbers, species and flight direction. If flocks of migrants seemed to change direction while in sight both the initial and final flight directions were recorded. Land birds observed at the sight were listed with a direction given as "other." An attempt was made to make judgements about land birds that seemed to have crossed Lake Superior from the N and NW. If the observer felt that the birds were initially seen far enough out the birds were given a flight direction (East, Southeast or South) and are listed in our data using the qualitative designation "Lake Crossers". Clearly there is no proof that these birds crossed Lake Superior but it seemed more likely than not and these numbers must be used with caution.

A count was also conducted at Hebard Park (three miles west of Copper Harbor) from the 26<sup>th</sup> of September through the 21<sup>st</sup> of October. The count was conducted by Gary Palmer (with assistance some days by Skye Haas) and the same protocol was used as at Freda, including digital data entry.

We used the same basic protocol as is used at Whitefish Point (WPBO) for their fall waterbird count and comparisons will be made with WPBO as well.

**Results and Discussion**

*Waterbird Movement*

The Freda count (93 days) recorded a total of 32,756 migrating ducks, loons and grebes. Of these 21,283 were passing NE, 11,251 were going SW, 189 were flying SE and 33 were moving S. A total of 8,343 Canada Geese passed going S, SE or SW. The vast majority were going S. Four Snow Geese, two Tundra Swans and three unidentified Swan were seen. A total of 73 Double-crested Cormorants passed S, SE or SW. Total duck, loon and grebe numbers for the Freda count are listed in Table 2.

The Hebard Park count (26 days) had a total of 32,299 migrating ducks, loons and grebes. Of these 31,839 were going E and 460 were going W. Hebard had 2,229 Canada Geese go past and two Cackling Geese. Canada Goose counts between the two Keweenaw sites were very similar in magnitude. Freda had 1,853 pass during the Hebard count period. Hebard had a single Swan Species going E on 29 Sept and 4 Swan species going W on 16 October. Only two Double-crested Cormorants were recorded at Hebard.

The only rare duck seen at either site was a single Harlequin Duck flying east past Hebard on 28 September.

*Comparing the Freda and Hebard Counts*

There seem to be two main points of comparison between the two Keweenaw count sites that can be learned from this years' 26 days of simultaneous counts (and the smaller counts done in previous years). One - Hebard Park – ie any location near the tip of the Keweenaw – has vastly more eastbound birds than Freda. The table below shows that. But Freda (and other locations west of Houghton) have vastly greater numbers of westbound birds that locations closer to the tip of the peninsula. Two – the total from Freda's three month count this year (32,756) comes close to the total from the three-month count from Hebard in 2014 – 35,001 (East 34,431 + West 570). With the large number of SW bound birds mostly making up for the much smaller number of E bound birds compared to Hebard.

Table 1

Eastbound birds during 26 Sept through 21 Oct 2017 at Whitefish Point, Hebard Park and Freda

	WPBO	Hebard	Freda		WPBO	Hebard	Freda
GADW	306	185	118	SUSC	976	371	344
AMWI	2028	1285	399	WWSC	1181	400	72
MALL	973	575	277	BLSC	31	6	16
BWTE	74	24	4	LTDU	3556	104	31
NSHO	25	19	25	RBME	3441	2160	160
NOPI	330	131	19	unDUCK	1611	6608	3695
GWTE	231	98	55	RTLO	338	105	89
REDH	4446	7147	3144	COLO	1110	589	200
GRSC	6098	2976	809	HOGR	235	592	94
LESC	783	413	59	RNGR	3653	1321	372
unSCAU	2702	1041	1854				
unAythya	1888	5223	1440		36479	31839	13328

Totals include some species not shown in this table.

WPBO had the highest count with Hebard's count at approx. 87% of that. Freda's count was approx. 36% of WPBO and approx. 42% of Hebard. Remember, the comparisons in the chart are only for Eastbound birds.

Several points need to be made:

Within the Keweenaw, Hebard clearly has a much higher number of eastbound birds than Freda, indicating that a large number (18,511) of waterbirds must hit the Keweenaw shoreline somewhat N of Freda and follow the shoreline NE and E to be counted at Hebard (see map below). Virtually all species had higher eastbound numbers at Hebard.

The total at Hebard Park is a very high percentage of the total at WPBO. This was not the case during the full three-month count at Hebard Park in 2014 when the Hebard total was slightly more than half of the WPBO total. The lower percentage in 2014 was likely the result of the much larger numbers of Long-tailed Duck that pass WPBO compared to the Keweenaw. The one-month count at Hebard ended just as the major movement of LTDU began.

Table 1 does not show the 7,243 waterbirds that passed Freda flying SW during the period. The total of westbound birds at Hebard Park in the period was 460. Meaning that at least 6,783 waterbirds hit the shoreline between the two sites and followed the shoreline going SW to be counted at Freda.

Our counts this year provide data to support a statement by the late Laurence Binford's in his 2005 book, *Birds of the Keweenaw*. Referring to the Keweenaw shoreline he said, ". . . it also provides an aiming point for birds migrating southward, southeastward and southwestward from Canada." The 25,294 ducks, loons and grebes that appeared between our two count sites during the simultaneous count period testify to that fact.

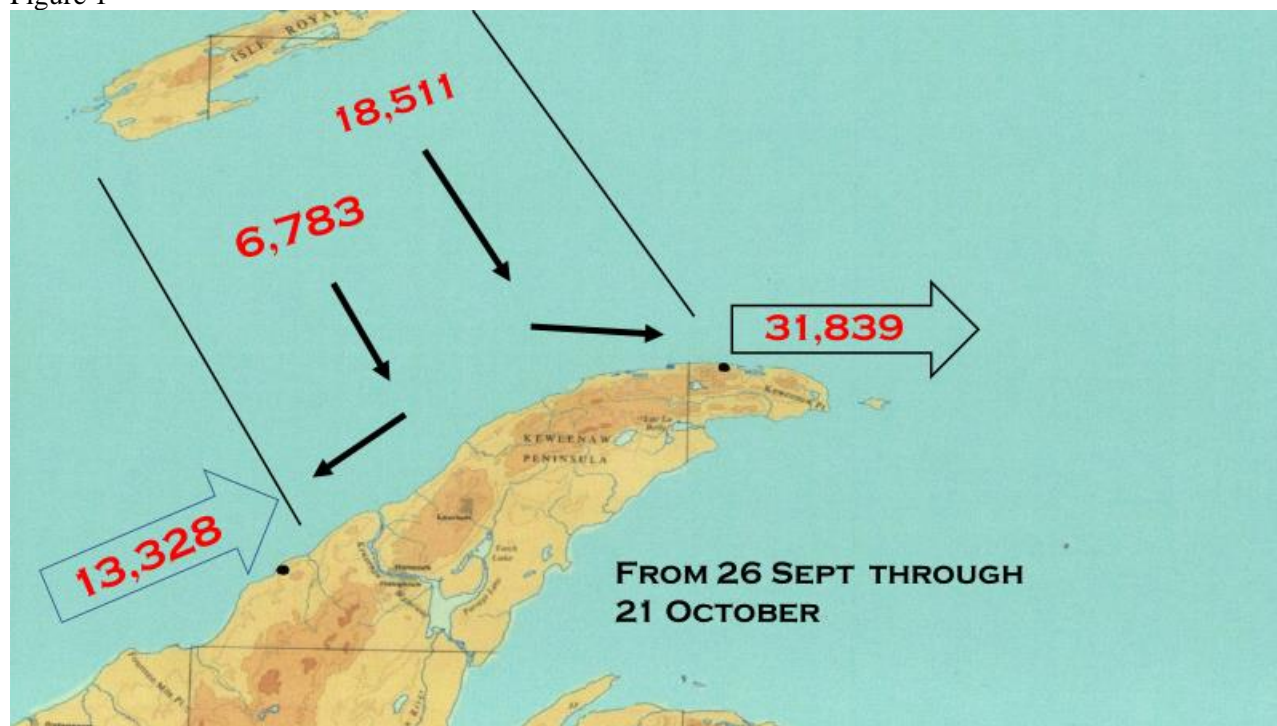
Common Loon followed three general flight paths at Freda. Most flew parallel to the shore heading NE while lesser numbers flew SW and quite a few flew SE. These last birds were first seen out over the lake to either the NW or W and had a SE flight path that they maintained, just gaining altitude and flying inland. A modest number of COLO were first seen coming SE across the lake but turned NE as they neared the shore. Hebard had a few COLO angling in from the NW all of which seemed to turn and head E. Hebard did have 3 COLO that came south and seemed to fly inland continuing the southward flight path.

Figure 1 is a map showing the Keweenaw peninsula and part of Isle Royale

The two count sites are marked by black dots. The large arrows contain numbers indicating numbers of ducks, loons and grebes moving NE and E past the two sites. The number '6,783' represents the difference between the westbound birds at the two sites. The number '18,511' is the difference between the eastbound birds at each site. A starting assumption here is that birds moving NE past Freda are quite likely to continue following the shore and get counted going E at Hebard. Also, birds flying west past Hebard are likely to continue SW past Freda. Since Hebard had 31,839 eastbound birds and Freda's contribution to that count was only 13,328, then 18,511 had to appear between the two sites and follow the shore eastward past Hebard. The westbound numbers for each site are not given in the figure to avoid clutter. But Hebard had 460 westbound ducks, loons and grebes and Freda had 7,243. The 6,783 on the map is the difference between the two. Those birds had to have entered the flight path between the two sites and turned SW passing Freda but not Hebard.

The most likely path for these incoming birds was flying SE from the Minnesota shore and Isle Royale. The black arrows in the map are not meant to be precise depictions of the flight direction. Some truly do seem to come from NW to SE but many others seem to be flying east when first seen and some seem to be going SSE. This phenomenon was witnessed significantly at Freda, less often at Hebard. I described those birds as "angling in", compared to the 'normal' flight path which just parallels the shoreline. The two counters tried to keep a count of the flocks whose flight direction when initially seen was approaching the shore at an angle but then turned to follow the shore either east or west.

Figure 1



**“Angling In’**

At Freda a total of 156 “flocks” of ducks, loons or grebes were seen to be angling in, with 1007 individuals in those flocks. Unidentified duck had 38 flocks and 525 birds. The *Aythya* group (including unidentified *Aythya*, unidentified scaup, Lesser Scaup, Greater Scaup and Redhead) totaled 22 flocks and 225 individuals. The apparent initial flight direction of these flocks varied mostly from E through SE and some were S. These birds would have all changed to either SW or NE following the shore. Common Loon had the most ‘flocks’ with 59 but only 84 birds. Common Loon also had a further 162 individuals that came in heading SE and continued SE overland without changing directions. Common Loon are usually the only species that will fly over land during daylight hours. But on 3 November, Louie had two flocks of Common Goldeneye, totaling 11 birds, flying south off the lake and inland.

At Hebard, Gary had 132 birds angling in with COLO leading at 49, GRSC at 34, unduck at 24, HOGR – 8, RBME – 8, SUSC – 7, and 2 MALL. Of course, the Hebard season was only 26 days compared to 93 at Freda.

**Intentions of SW bound ducks / Turnarounds**

If eastbound birds are assumed to follow the Keweenaw shoreline and pass into the eastern half of Lake Superior and then out through Whitefish Bay or other exits to the lower lakes, what the heck are the SW bound birds doing? Where are they going? If it was a small number compared to the NE bound it wouldn’t be a big thing. But the SW bound birds this season represented almost 53% of the NE bounds. I assume that the SW birds really do intend to move SW away from the Keweenaw and perhaps leave Lake Superior somewhere near Ashland, heading further SW into the Mississippi flyway. But it is possible that many of the SW bound birds are simply confused and are only temporarily moving SW and might turn around out of sight of the Freda count and return going NE. During the

count at Freda 24 flocks of ducks were seen to change their flight directions 180 degrees. These flocks totaled 299 birds and the great majority of those flocks made a change from SW to NE. If almost 300 birds were actually observed reversing their direction it must be seen as possible that a much larger number actually do so and are just not observed doing it because it takes place out of sight of the Freda observer.

**Comparing the Keweenaw to Whitefish Point**

In general, WPBO clearly has a much greater number of ducks, loons and grebes pass than the Keweenaw and this years’ counts reinforce that perception. In 2017 WPBO had 95,764 eastbound ducks, loons and grebes pass and Freda had 21,283. If you assume that the whole season at Freda represents 42% of what would have been counted at Hebard (the percentage tallied from Table 1), that gives an estimate for a three-month count at Hebard this year, of around 45,000. That number would match well with the ratio of eastbound birds between the two sites found in 2014 (WPBO 84,858 Hebard 34,431). In other words, our counts this year seem to reinforce the general comparisons of numbers of ducks, loons and grebes seen at WPBO and the Keweenaw given in Youngman et al. (2017).

In the three-month fall count at Hebard Park conducted by CCA / Louie Dombroski in 2014 only 418 Long-tailed Ducks passed compared to 27,396 at WPBO. This year Freda tallied 1,567 and WPBO had 35,003. As is fitting for Freda the LTDU went both SW(741) and NE(826). But clearly the Keweenaw doesn’t get anywhere near the LTDU that WPBO does.

In 2014 Hebard had 2144 Redhead and WPBO had 1612. This year Freda had 3187 and WPBO had 4724. Though clearly Freda misses a lot of the total Keweenaw Redheads (see table above). During the 26 days of counts at all three sites Hebard had 7,147 and WPBO had 4,446. The Keweenaw still clearly leads in Redheads which means thousands must be leaving Lake Superior between the tip of the Keweenaw and Whitefish Point.

**Comparing Freda 2017 to Hebard Park 2014**

Comparing Freda 2017 to Hebard Park 2014			
Freda both ways		Hebard E only	
unDUCK	6693	unDUCK	7188
REDH	4633	RNGR	7183
unSCAU	4221	RBME	5686
RBME	2769	unAyth	3402
RNGR	2739	REDH	2144
unAythya	2673	COLO	1580
GRSC	1918	GRSC	1276
LTDU	1567	unSCAU	1243
COLO*	732	WWSC	972
AMWI	612	COGO	490
MALL	587	MALL	419
WWSC	560	LTDU	418
SUSC	505	HOGR	395
COGO	443	AMWI	390
GWTE	379	BWTE	381
LESC	241	unDABB	170
HOGR	207	SUSC	165
BWTE	183	dwSCOT	141
NOPI	163	BUFF	132
GADW	161	unTEAL	124
COLO totals include 162 SE bound			

Table 2 (to left) gives the top twenty “species” seen during the three-month counts conducted at Hebard Park in 2014 and at Freda in 2017. One would expect great similarity in species rank, but total numbers would be harder to understand due to the clear difference shown between total birds at Hebard and Freda during this years 26 day simultaneous count. Hebard should show significantly higher numbers due to its greater eastbound flow, but how much do the southeastbound birds seen only at Freda bring the Freda total up to the Hebard total?

One species that has almost no west or southwest bound movement, RNGR, clearly drops in total and ranking, as would be expected. The lesser eastbound count to be had at Freda is not replaced by southwest bounds for RNGR. The situation for COLO is probably similar.

Clearly 2017 had more Redheads moving through the Keweenaw than 2014 did (see Hebard’s REDH numbers in Table1 as well as Table 2).

It seems likely that the much higher LTDU total for 2017 is not a location based difference but is probably just a greater movement of LTDU through the Keweenaw this year compared to 2014.

But perhaps it is foolish to look for any patterns when comparing only two seasons from two different sites.

### ***Gull and Tern Migration***

Bonaparte Gulls passing Freda totaled 1,594 of which 1,453 passed going NE. Terns passing Freda totaled 539 of which 506 were going NE.

Hebard had vastly fewer Bonapartes and terns: only 272 eastbound Bonaparte and 3 eastbound terns. During that same period Freda had 579 Bonaparte's and 89 terns going NE. This difference seems quite strange. Does this mean that large numbers of Bonaparte and terns are turning eastward across the peninsula somewhere between Freda and Hebard? They could be flying farther out and unseen at Hebard but that seems highly unlikely. In the three month count conducted at Hebard in 2014 only 15 Bonaparte's Gulls passed going east and 8 going west.

A few rare gulls and Jaegers did pass by Freda. Eight Jaegers were seen there: 3 unidentifieds each, going both NE and SW and two Parasitics were seen going NE. Most jaegers were seen between 24 August and 4 September, with one straggler on 29 September. A Sabine's Gull passed going NE on 13 October and a Black-legged Kittiwake passed SW on 8 November. An adult Iceland Gull passed SW on 6 November. No jaegers or rare gulls were observed at Hebard.

Herring and Ring-billed Gulls were of course seen at both sites and no doubt a significant eastward migration was taking place over the course of the three-month count at Freda, but the virtual impossibility of separating migrants from the daily east and west movement of local birds make the numbers recorded of little use. Another reason gull numbers are untrustworthy is that on days with very heavy duck, loon, grebe movement the counters priority is the ducks, loons and grebes and gull spotting and recording fall by the wayside.

### ***Lake Crossers***

I define "lake crosser" as any land bird that is seen well out over Lake Superior and is seen to come in to shore within sight of the counter. There is no proof that these birds actually crossed the lake. It is a judgment call on the part of the counter. Our observers saw Bald Eagles coming in off the lake many, many times but assumed they were just local birds out foraging. Peregrine Falcon is probably the only other bird that would regularly do the same – so our Peregrine "lake crossers" could well be an inflated number.

At Freda 256 birds and one bat were judged as lake crossers. Out of the birds seen, unidentified finches were most numerous at 94, unidentified passerine had 77, Pine Siskin had 18, American Crow had 15, Sandhill Crane had 8, unidentified shorebirds had 7, unidentified warbler had 5, Northern Flicker had 4, Peregrine Falcon, Rough-legged Hawk and Great Blue Heron all had 3, Osprey, Short-eared Owl, American Pipit and Lapland Longspur had 2 and Northern Harrier, Sharp-shinned Hawk, unidentified raptor, Long-eared Owl, Asio owl species, Belted Kingfisher, Red-breasted Nuthatch, Palm Warbler, Dark-eyed Junco and unidentified sparrow all had 1.

Hebard Park had 345 birds and one bat seeming to cross the lake. Pine Siskin lead easily with 226, unidentified passerines had 88, Peregrine Falcon had 12, Short-eared Owl had 4, Dark-eyed Junco had 3, Horned Lark, Golden-crowned Kinglet and Rusty Blackbird had 2, Northern Flicker, Fox Sparrow, Mourning Dove and Palm Warbler had 1 each. Remember Hebard had only a 26 day count period.

### **Raptor Migration**

A small amount of raptor migration was observed at Freda. On the 15<sup>th</sup> and 16<sup>th</sup> of August, 28 Broad-winged Hawks, 6 Red-tailed Hawks and 1 Sharp-shinned Hawk were observed moving SW along the shore. A small number of both diurnal and nocturnal raptors were seen apparently completing a migration flight across Lake Superior at both count sites. Those birds are listed above under 'Lake Crossers'.



**Passerine Migration**

**Rarities**

On 21 September, three House Sparrows were seen at Freda. House Sparrows are quite rare in the Keweenaw. On 18 October, one Townsend’s Solitaire was seen at Freda. A single LeConte’s Sparrow was seen at Hebard Park on 7 October.

Table 3 Duck, loon and grebe totals for Freda Count, 15 Aug – 15 Nov 2017

Species		NE Rank		SW Rank	
<b>Rank - Total Both Ways</b>					
unDUCK	6693	unDUCK	4210	unDUCK	2483
REDH	4633	REDH	3187	unSCAU	1707
unSCAU	4221	RNGR	2665	REDH	1446
RBME	2769	unSCAU	2514	RBME	1267
RNGR	2739	unAythya	1721	unAythya	952
unAythya	2673	RBME	1502	GRSC	786
GRSC	1918	GRSC	1132	LTDU	741
LTDU	1567	LTDU	826	COGO	321
AMWI	612	AMWI	514	GWTE	257
MALL	587	WWSC	502	MALL	248
COLO	569	COLO	442	NOPI	138
WWSC	560	SUSC	369	LESC	137
SUSC	505	MALL	339	SUSC	136
COGO	443	BWTE	169	COLO	127
GWTE	379	HOGR	160	AMWI	98
LESC	241	GADW	149	RNGR	74
HOGR	207	RTLO	134	WWSC	58
BWTE	183	GWTE	122	COME	50
NOPI	163	COGO	122	HOGR	47
GADW	161	LESC	104	BUFF	39
RTLO	138	NSHO	103	NSHO	25
NSHO	128	BUFF	80	RNDU	23
BUFF	119	BLSC	50	ABDU	19
COME	84	COME	34	waterbird sp.	17
BLSC	54	unTEAL	27	BWTE	14
ABDU	36	NOPI	25	GADW	12
RNDU	35	dwSCOT	19	dwSCOT	9
unTEAL	28	ABDU	17	BLSC	4
dwSCOT	28	RNDU	12	HOME	4
waterbird	18	UNMERC	11	RTLO	4
UNMERC	14	unLOON	11	UNMERC	3
unLOON	13	HOME	7	WODU	2
HOME	11	CANV	3	unLOON	2
CANV	3	waterbird sp.	1	unTEAL	1
WODU	2	WODU	0	unDABB	0
unDABB	0	unDABB	0	CANV	0