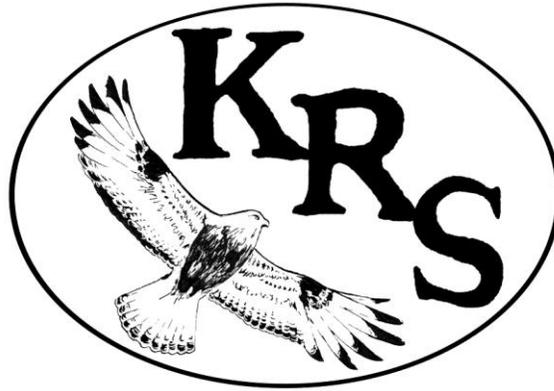


Keweenaw Raptor Survey



End-of-Season Summary for Spring 2012

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Introduction

In 2010, Copper Country Audubon and Laughing Whitefish Audubon launched the Keweenaw Raptor Survey, a three-year survey at Brockway Mountain (Copper Harbor, Michigan) to study spring raptor migration in the Keweenaw Peninsula (Haas & Gayk 2010). Results from the 2010 and 2011 surveys have been published in previous reports (Henschell 2010, Green 2011). This summary will report the results from the third and final survey at Brockway Mountain under the KRS banner in 2012.

The Count

Systematic counts were conducted daily from 15 March to 15 June, 2012 (the “count season”) from West Bluff (the “count site”), a vantage point on Brockway Mountain located at N47.46399, W87.96954¹ (approximately 4 miles west of the town of Copper Harbor) and stationed 1328 feet above mean sea-level and approximately 728 above the average surface elevation of Lake Superior. The defined survey count period each day (the “survey period”) is as follows: 15 March thru 31 March, 0900 – 1500 EST (Eastern Standard Time); 1 April thru 31 May, 0800 – 1600 EST; 1 June thru 15 June, 0800 – 1400 EST. Migration for many raptor species started early in spring 2012; on 18 March, the survey switched to the same survey period (per protocol) used in April and May (0800 – 1600 EST). Observers were also instructed to reduce count periods or cancel count days if weather should prove inclement or unsafe. As with the previous surveys, a count shelter was erected on-site for temporary relief from cold & rainy weather conditions, but the shelter was damaged by heavy winds on 27 March and was not reinstalled.

Surveys were conducted on 92 of the 93 possible count days in the count season, accounting for a total of 666.3 count hours; only 1 count day (16 April) was cancelled completely due to inclement weather and poor visibility. Arthur Green served as the primary counter/observer in spring 2012, recording 571.2 count hours. Substitute counters Joseph Youngman recorded 24.0 count hours, Max Henschell 8.0 count hours, Louie Dombroski 20.0 count hours, Zach Gayk 15.92 count hours, Karen Lund 4.0 count hours, Janice Sweet 4.0 count hours, Greg Cleary 19.25 count hours.

Raptors

A standardized hourly count for all species of diurnal raptors (i.e., birds belonging to orders *Accipitriformes* and *Falconiformes*) was conducted in accordance with protocols defined by HMANA 2006 and Haas & Gayk 2010. Where any potential ambiguity existed between protocols, Haas & Gayk 2010 was used. For field identification of all raptor species, we consulted Sibley 2000, Liguori 2005, Wheeler 2003, and Clark 2001 (for aging Bald Eagles). Eastbound and westbound raptor flights were recorded on separate data forms.

Over the course of the spring 2012 survey, 19,907 eastbound raptors of 16 species (including 45 birds identifiable only to genus or order) and 4078 westbound raptors of 14 species (including 23 birds

¹ WGS 84

identifiable only to genus or order) were observed migrating past the count site. This report will try to avoid duplicating reports from prior surveys, so treatment for each species will be brief: common and scientific name, the two-letter HMANA designation (HMANA 2006), and pertinent notes about this season's count. Survey results for 2010 and 2011 were taken from Henschell 2010 and Green 2011, respectively, unless otherwise stated. A condensed count season summary is presented at the end of this summary in Table I (which is duplicated in Appendix A). Daily totals for all raptor species are presented in Appendix B.1 (eastbound flight) and Appendix B.2 (westbound flight).

Turkey Vulture (*Cathartes aura*) "TV"

285 eastbound migrant TV were recorded in 2012 (1.4% of the eastbound season total). This represents 59.7% of 2011's total of 477, and only 37.6% of 2010's total of 758. First observed during the 2012 survey on 19 March, handily acing the SEAD (Spring Earliest Arrival Date) in Binford 2006 by two weeks.

Green 2011 remarked on the "remarkable" disparity between the counts of immature TV recorded during the pilot 1992 survey at Brockway Mountain (see: Binford 2006) and those recorded by KRS in 2010 and 2011. This disparity deserves more scrutiny. KRS recorded 10 eastbound immature TV in 2012, a figure consistent at first glance with the totals for both 2011 (6) and 2010 (none).

132 westbound TV were recorded in 2012 (2.7% of the westbound seasonal total); 79.0% of 2011's total of 167, and 30.6% of 2010's total of 432.

Osprey (*Pandion haliaetus*) "OS"

62 eastbound OS were recorded in 2012; nearly three times 2011's total of 21, and a more modest gain from 2010's total of 47. Date of first observation 13 April.

6 westbound OS were recorded in 2012; two more than the 4 seen in 2011, and just under half the 2010 total of 13.

Bald Eagle (*Haliaeetus leucocephalus*) "BE"

1155 eastbound migrant BE were recorded in 2012 (5.8% of the eastbound total), a dramatic increase of 211.9% over 2011's total of 545, and standing at 139.5% of 2010's total of 828. Both resident and migrant Bald Eagle were observed regularly throughout the count season. Date of first observation 15 March.

Of the 1155 eastbound birds recorded in 2012, 1071 birds were identifiable to age class (92.7%): there were 364 juveniles (31.5%), 279 subadult birds (24.1%), and 428 adults (37.1%).

383 westbound BE were recorded in 2012 (8.0% of the westbound season total); 120.8% of 2011's total of 317, and 75.8% of 2010's total of 505.

Northern Harrier (*Circus cyaneus*) "NH"

175 eastbound NH were recorded in 2012; more than twice the 2011 count of 80, and a more modest increase from 2010's total of 145. Date of first observation 17 March.

12 westbound NH were recorded in 2012; two more than 10 seen in 2011, and 66.7% of 2010's total of 18.

Sharp-shinned Hawk (*Accipiter striatus*) "SS"

1923 eastbound SS were recorded in 2012 (9.7% of the eastbound season total); 79.3% of 2011's total of 2425, 121.4% of 2010's total of 1584. Notably early first observation 17 March (see: Binford 2006).

230 westbound SS were recorded in 2012 (5.6% of the westbound season total); 54.4% of 2011's total of 423, 95.0% of 2010's total of 242.

Cooper's Hawk (*Accipiter cooperii*) "CH"

14 eastbound CH were recorded in 2012; twice as many as 2011's total of 7, and 60.9% of 2010's total of 23. Date of first observation 17 April.

3 westbound CH were recorded in 2012; 2 were seen in 2011, and only 1 in 2010.

Northern Goshawk (*Accipiter gentilis*) "NG"

23 eastbound NG were recorded in 2012; the same total was recorded in 2011, just 79.3% of 2010's total of 29. Date of first observation 19 March.

Only 3 westbound NG were recorded in 2012; one more than the 2 seen in 2011, and 27.3% of 2010's total of 11.

Red-shouldered Hawk (*Buteo lineatus*) "RS"

17 eastbound RS were recorded in 2012; more than three times than 2011's total of 5, and nearly twice 2010's total of 9. Dates of first and last observation 16 March and 28 April, respectively.

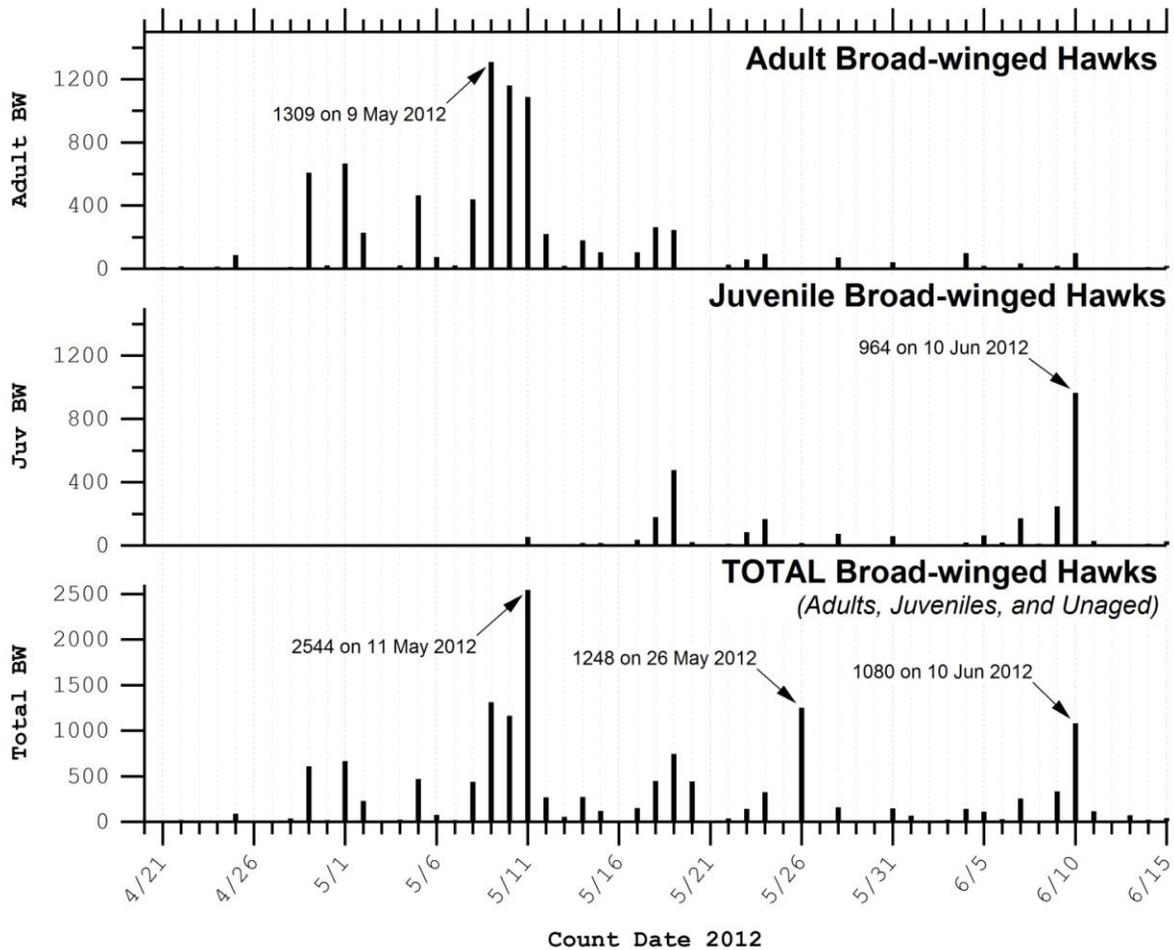
2 westbound RS were recorded in 2012; only 1 was observed in both 2011 and 2010.

Broad-winged Hawk (*Buteo platypterus*) "BW"

14,754 eastbound BW were recorded in 2012 (74.1% of the eastbound season total raptors); 157.9% of 2011's total of 9346, and more than *three times* (300.8%) 2010's total of 4905. Date of first observation 20 April.

There appears to be enough extant data suggesting that BW migration in the Keweenaw might be regularly protracted into the summer months (Binford 2006, J. Youngman pers. comm., Green 2011). Flights of "several hundred" BW were observed at Brockway Mountain even after the formal end of the survey in 2012 (D. Mues pers. comm.). This behavior deserves further study.

Of 14,754 eastbound birds recorded in 2012, 10,767 were distinguishable to age class (72.8%): there were 2783 juveniles (18.9%) and 7984 adults (54.1%). Plotting daily counts of BW by age class shows that adult BWs peaked roughly one month before juvenile BWs, suggesting a similar “bi-modal” distribution to the BW flight in 2011 (Green 2011).



3098 westbound BW were recorded in 2012 (80.0% of the westbound season total); 287.9% of 2011’s total of 1076, and more than three times (312%) of 2010’s total of 993.

Swainson’s Hawk (*Buteo swainsoni*) “SW”

6 eastbound SW were recorded in 2012; two more than the 4 recorded in 2011, and one shy of the 7 recorded in 2010. Date of first observation 22 April, with notably late observation 12 June (see: Binford 2006).

No westbound SW were recorded in 2012; this is consistent with the 2011 and 2010 surveys which also did not record any westbound SW.

Red-tailed Hawk (*Buteo jamaicensis*) "RT"

1254 eastbound RT were recorded in 2012 (6.3% of the eastbound season total); 168.3% of 2011's total of 745, and 167.6% of 2010's total of 748. Notably early observation 17 March (see: Binford 2006).

A light morph "Western" RT (*B. j. calurus*) was observed on both 20 March and 21 March. No dark morph "Western" birds were recorded in 2012.

145 westbound RT were recorded in 2012 (3.6% of the westbound season total); 98.6% of 2011's total of 147, and 81.5% of 2010's total of 178.

Rough-legged Hawk (*Buteo lagopus*) "RL"

238 eastbound RL were recorded in 2012 (1.2% of the eastbound season total); 242.9% of 2011's total of 98, and exactly twice 2010's total of 119. Dates of first and last observation 15 March and 24 May, respectively.

Of 238 eastbound birds recorded in 2012, 229 birds were distinguishable to color morph (96.2%): 186 light (78.2%) and 43 dark (18.0%); a dark to light morph ratio of roughly 1:4.3.

14 westbound RL were recorded in 2012; one more than 2011's total of 13, and exactly half 2010's total of 28.

Golden Eagle (*Aquila chryaetos*) "GE"

30 eastbound GE were recorded in 2012; an increase from 2011's total of 23, and just shy of 2010's total of 31. Dates of first and last observation 16 March and 11 May, respectively.

14 westbound GE were recorded in 2012; 87.5% of 2011's total of 16, and 58.3% of 2010's total of 24.

American Kestrel (*Falco sparverius*) "AK"

67 eastbound AK were recorded in 2012; 58.8% of 2011's total of 114, and 72.8% of 2010's total. Notably early first observation 17 March (see: Binford 2006); a nesting pair was regularly observed making the rounds past West Bluff by the first week of April.

No westbound AK were recorded in 2012; 12 were recorded in 2011, and 9 were recorded in 2010.

Merlin (*Falco columbarius*) "ML"

13 eastbound ML were recorded in 2012; just under half of 2011's total of 28, and just 31.0% of 2010's total of 42. Notably early first observation 17 March (see: Binford 2006).

These migration totals belie this species' conspicuousness as a resident breeder in nearby Copper Harbor, where several individuals could be easily seen & heard by the first week of April.

Just 1 westbound ML was recorded in 2012; 2 were recorded in 2011, whereas 9 were recorded in 2010.

Peregrine Falcon (*Falco peregrinus*) “PG”

26 eastbound PG were recorded in 2012; 76.5% of 2011’s total of 34, and 130.0% of 2010’s total of 20. First observation a *westbound* bird on 17 April, the same SEAD in Binford 2006; first eastbound observation 21 April.

7 westbound PG were recorded in 2012; 6 were recorded in 2011, and 5 were recorded in 2010.

Unidentified Accipiter (*Accipiter sp.*) “UA”

Unidentified Buteo (*Buteo sp.*) “UB”

Unidentified Falcon (*Falcon sp.*) “UF”

Unidentified Eagle (eagles of *Accipitriformes sp.*) “UE”

Unidentified Raptor (*Accipitriformes sp.*) “UR”

Not all birds can be identified comfortably to genus or even order. These “Unidentified” categories provide some recourse for the counter (and the day’s raptor count) when viewing conditions or relative inexperience with certain species leaves the counter with some doubt as to what he is looking at. That said, 45 eastbound raptors (2 UA, 13 UB, 1 UF, 14 UE, 15 UR; and 23 westbound raptors (1 UB, 12 UE, 10 UR; were placed in these categories.

As suggested by Green 2011, the sparseness of Cooper’s Hawk in the Keweenaw may explain why UA counts during the 2012 survey were much lower than most count sites in the northeastern United States (HMANA 2012), as these are widely considered a common source of confusion (particularly with Sharp-shinned Hawk) where present in number.

Golden Eagle can also pose difficulty, and distinguishing them (especially at distance) from Bald Eagle is another common source of confusion for many observers. This confusion seems to bear out for both the eastbound and westbound counts in the relatively large percentage of UE in the total “Unidentifieds” for the 2012 survey. Because GE, while relatively scarce, are a winter fixture in the Keweenaw, we recommend that future surveys at Brockway Mountain brush up on their eagle identification to minimize UE numbers.

Non-raptors

In addition to the standardized raptor counts, daily simultaneous counts were conducted for *all bird species* that were detected visually or aurally (including raptors, waterbirds, and passerines) during the count season in accordance with KRS protocol (Haas & Gayk 2010). A tabulation of the first and last observation for 102 non-raptor species recorded at West Bluff during the survey period is presented in Appendix C. Where appropriate, the maximum daily count with date of first occurrence of this count is supplied in this table. Dates and values in **boldface** indicate observations that would be considered notable by Binford 2006. Season totals are provided for all species, but it is important to use discretion in interpreting them: with only some exceptions (e.g., waterbirds), detected individuals are not

necessarily unique and there is no guarantee that they were not observed again (i.e., “double counted”) later during the count season.

Weather

Weather measurements, including wind speed, wind direction, temperature, barometric pressure, percentage of sky covered by cloud-form, visibility, and precipitation type (e.g., haze, rain, snow) were taken at the top of each count hour throughout the count season. These measurements provide atmospheric context for the migration observed each count day. A table of count period lows and highs for temperature, barometric pressure, and wind speed are presented in Appendix D.

2012 saw low snowfall as a snowmobile was not needed this year. March had two weeks of exceptionally warm weather. The season was particularly interesting in that there were many days of fairly strong North winds in April and early May, and it is possible that this might have both concentrated and changed the distribution of the peak migration period.

The exceptionally mild weather in March 2012 might be the cause for some of the early arrivals, and also the possibility that some species may have been "short stopping" in turn (e.g., juvenile Rough-legged Hawk, counter to convention at most hawkwatches, were among some of the first RL to return this year).

Three years is not very long as migration monitoring goes. It is likely that we do not have a credible baseline (yet) for the migration at Brockway to really say what's normal or not, and this includes the dates for early arrival/late departure for non-raptors as well. Even the seemingly remarkable numbers of Bald Eagle (BE) in March may or may not be so remarkable. In addition, there is reason to suspect that significant BE movements may occur before the formal start of our survey on 15 March some years, further complicating this matter.

Visitors

Brockway Mountain is a popular attraction for tourists, especially when road conditions on Brockway Mountain Drive permit ready access by automobile. KRS counters made a best attempt at counting visitors who came within proximate distance of the watch site during the count period in an attempt to assess the potential exposure our spring surveys have with the general public. Over the course of 2012 survey, **5257 people** stopped by during count hours, a dramatic increase from 2011's visitor total of 2765. Much of this can be attributed to the unseasonably warm weather this winter and early spring, which ensured unseasonably early access to Brockway Mountain Drive by automobiles, motorcycles, and ATVs. Included in the number above, on May 4 visitors included approx. 300 school kids, a project coordinated by Copper Country Audubon and the Lake Superior Stewardship Initiative. This is the third year kids have been introduced to Brockway Mountain and hawk migration. Daily visitor totals are presented in Appendix E.

Acknowledgements

Funding for Keweenaw Raptor Survey in 2012 was provided by the memberships of Copper Country Audubon, Laughing Whitefish Audubon, Michigan Audubon, U.P. Sustainable Forest and Wildlife Fund of the Community Foundation for the Upper Peninsula, as well as numerous individual donors. Thank you.

Special thanks are due to Clyde and Lloyd Wescoat for allowing use of the Brockway Mountain property to conduct the count for all three years of the survey. Ken & Vicky Stigers of the The Pines Resort supplied lodging and other essential support to the KRS counters, including the use of their snowmobiles and ATVs.

Substitute counters included Joseph Youngman, Louie Dombrowski, Zach Gayk, Max Henschell, Karen Lund, Janice Sweet and Greg Cleary. Debra Mues of Copper Country Audubon volunteered nearly 70 count hours assisting KRS counters as an attentive observer in the second half of May and June. Sincere gratitude is extended to the people of Copper Harbor, Michigan, whose genuine interest in this count showed in their warm encouragement of our efforts on the mountain over the past three years.

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Table I – Dates of first and last observation for each species, date and value of maximum daily count, accompanied by eastbound/westbound season totals. Date in **boldface** indicates westbound observation.

SPECIES	FIRST	MAX	MAX DATE	LAST	E. TOTAL	W. TOTAL
Turkey Vulture	19 Mar	39	7 Apr	10 Jun	285	132
Osprey	13 Apr	6	19 May	11 Jun	62	6
Bald Eagle	15 Mar	203	17 Mar	15 Jun	1155	383
Northern Harrier	17 Mar	22	14 Apr	14 Jun	175	12
Sharp-shinned Hawk	17 Mar	240	9 May	15 Jun	1923	230
Cooper's Hawk	17 Apr	2	11 May	4 Jun	14	3
Northern Goshawk	19 Mar	4	2 Apr	19 May	23	9
Red-shouldered Hawk	16 Mar	4	19 Mar	28 Apr	17	2
Broad-winged Hawk	20 Apr	2544	11 May	15 Jun	14574	3098
Swainson's Hawk	22 Apr	1	--	12 Jun	6	0
Red-tailed Hawk	17 Mar	192	11 May	15 Jun	1254	144
Rough-legged Hawk	15 Mar	39	7 Apr	24 May	238	14
Golden Eagle	16 Mar	4	20 Mar	11 May	30	14
American Kestrel	17 Mar	11	7 Apr	23 May	67	0
Merlin	17 Mar	2	18 May	7 Jun	13	1
Peregrine Falcon	11 Apr	5	11 May	10 Jun	26	7
Unidentified Accipiter	--	--	--	--	2	0
Unidentified Buteo	--	--	--	--	13	1
Unidentified Falcon	--	--	--	--	1	0
Unidentified Eagle	--	--	--	--	14	12
Unidentified Raptor	--	--	--	--	15	10
TOTAL					19907	4078