

MOUNT LORETTE AND VICKI RIDGE, ALBERTA FALL 2017

With notes on the extended reconnaissance count at Steeples, BC

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Summary and highlights

This was the 26th consecutive year that some form of fall count has been conducted by RMERF observers at Mount Lorette, it was the 4th consecutive count at Vicki Ridge which was the first complete count there, and the 9th consecutive reconnaissance count at the Steeples site in BC. All three counts experienced cooler weather than in recent years as La Niña oceanic conditions prevailed, and November was particularly cold and snowy.

At Mount Lorette the combined species total of 3672 was 8.9% below the long-term average for valid counts and the Golden Eagle count of 3233 was 6% below the long-term average. Sixteen raptor species were recorded, but only 5 occurred in above average numbers. The high single-day Golden Eagle count of 426 on October 6 is the highest since 2013 and was 7.1% above average. The Golden Eagle immature:adult ratio of 0.49 is the highest ever and indicates a successful breeding season and the probable culmination of the current boreal Snowshoe Hare cycle. Seven species moved later than normal and 5 moved earlier, and the combined-species median passage date of October 14 was 2 days later than average.

The first complete Vicki Ridge count in SW Alberta produced a record 4237 migrants of 17 species in 52 days, including record counts of 16 raptor species, most notably 515 Rough-legged Hawks which is a new record for any RMERF count. The Golden Eagle immature:adult ratio was 0.59 and the median passage date was October 15, 1 day later than at Mount Lorette. The complete count at the site now makes such comparisons possible.

The Steeples site on the western flanks of the Rocky Mountains near Cranbrook, BC produced 629 birds of 14 species over 41 days and a record 185 hours, 6 of which occurred in record numbers including 276 Bald Eagles and the first ever fall records of Broad-winged Hawk at the site. The Golden Eagle immature:adult ratio of 0.44 again indicated an excellent breeding season for the species

Introduction

The Mount Lorette site is located in the Kananaskis Valley in the Front Ranges of the Rocky Mountains (50°58'N 115°8'W) 70 km due west of Calgary and immediately north-east of the Nakiska Ski Hill on Mount Allan. At this point the valley trends north-south and cuts obliquely across the NW-SE oriented trend of the Front Ranges. To the east of the observation site the Fisher Range has an average elevation of about 2500 m with Mount McDougall rising to 2726 m. Mount Lorette itself is 2487 m and is a geological continuation of the Fisher Range across the Kananaskis Valley to the NW. To the west the mountains of the Kananaskis Range are somewhat higher and include Mount Kidd (2958 m), Mount Bogart (3144 m) and Mount Allan (2819 m). The observation site is in a cleared area on the valley floor known as the Hay Meadow at about 1433 m. The site allows 360° views of the surrounding mountains and allows monitoring of raptors moving along the mountain ridges to the east and west, and especially those crossing the valley between Mount Lorette and the north end of the Fisher Range. The site is unique in that it allows observation of approximately the same high percentage of a population of migratory Golden Eagles both in spring and fall at exactly the same site, which has in the past been occupied for up to 190 days in a year. When downslope cloud obscures these mountains an alternate site at Lusk Creek, 13 km NE of the Hay Meadow site, is used to observe birds moving along the westernmost foothills ridge that have been displaced to the east from the Front Ranges. Birds seen here when active observation is occurring at Hay Meadow are not included in the official count.

Table 1A summarizes the fall counts from 1992 to 2016 at the principal observation counts for each year, while **Table 1B** summarizes the counts conducted solely at the Mount Lorette site. Migrating Golden Eagles were first seen moving to the NW over Mount Lorette on March 20, 1992, and the first extended (33 day, 280 hour) count was conducted there the following fall that yielded 2661 migrant raptors of which 2044 were Golden Eagles¹. Subsequently full-season fall counts (averaging 88 days, 865 hours) were conducted annually at Mount Lorette to 2005 with the exceptions of 1997 when a full count was conducted at Plateau Mountain and 2002 when serious illness to a key member of the team reduced the count to just 14 days. From 2006 to 2009 the principal fall observation site was moved to the Piitaistakis-South Livingstone location close to Frank in the Municipality of Crownsnest Pass in SW Alberta, during which time extended comparison counts were conducted at Mount Lorette during the main period of Golden Eagle migration. The Lorette counts in 2006, 2007 and 2008 lasted for 32 days, 25 days and 30 days respectively and are considered to be too short for statistical comparison with previous counts from which data from a standard 57-day count period September 20 to November 15 have been

recalculated. The only exception is 2009 where a 46-day count from September 20 to November 9 has been included. The period September 20 to November 15 captured an average of 97% of the total Golden Eagle count at Mount Lorette between 1992 and 2005. Long-term averages of several other raptor species, however, will differ more widely from full count statistics where significant movement usually occurs before September 20 (e.g. Red-tailed Hawk) or after November 15 (e.g. Bald Eagle). In this report data variances (number, median passage dates, age ratios) are given for the period September 20 to November 15 for averages of the 18 years 1993-1996, 1998-2001, 2003-2005 and 2009-15.

At Mount Lorette this season observers spent a total of 51 days (532.7 hours) of a possible 57 days at the site between September 20 and November 15 (**Table 2**), the days and hours being 6.6% and 5.4% below average respectively. Again no systematic daily count was held this season at the Piitaistakis-South Livingstone site, but a first full count of 52 days (418.9 hours) was conducted on Vicki Ridge near Beaver Mines, Alberta between September 23 and November 15 (**Table 8**). Vicki Ridge is located 17 km SSE of the Piitaistakis-South Livingstone site and monitors some of the birds that would have passed south along the Livingstone Range over that site. The Steeples site on the western flanks of the Rocky Mountains near Cranbrook, BC, was occupied for 41 days (185 hours) between September 20 and November 15 (**Table 11**). The 41-day count equals the previous highest number of days in 2009 and is 39.6% above average and the 185 hours is a new high and is 72.6% above average.

Table 14 summarizes the results from all three counts. **Table 15A** compares median passage and age ratio data between Mount Lorette and Vicki Ridge and **Table 15B** compares the percentages of raptor groups between the 3 sites.

Detailed daily summaries of these counts and counts from past years can be accessed on a blog published on the RMERF website at www.eaglewatch.ca.

Mount Lorette, Alberta

Weather

Table 3 summarizes the season's weather. This is the first count in several years conducted under the influence of cooler La Niña oceanic conditions. Six days, (September 21: snow and rain, October 2, 19, November 1, 2 and 3: all heavy snow) were lost because of the weather. This equals the highest number of full days lost (with 2013) and is 140% above the average for 2011-2016. Only one other day, October 11, was significantly shortened because of snow and November 4 was slightly curtailed resulting from the heavy snow of the previous three days. Only 4 other active days saw periods of rain and only 9.8% of active days saw precipitation which is 63.5% below the average of the previous five years. The overall average daily maximum temperature was 7.1 °C which is 19.8% lower than the average of the last five years. The average high temperature in September was 14.5 °C (10.2% below average), in October it

was a cool 8.3°C (-7.1%) and in November it was a cold -1.9 °C (-145.1%). The highest maximum temperature was 21 °C on September 28 and 29, the lowest minimum temperature was -23 °C on Nov 4, and on 5 active days, November 4-8, the temperature failed to rise above freezing, which is 6.1% above the average of the last 5 years. Five days (9.8%, which is 39.7% above average) were either completely cloudless or had a maximum cloud cover of up to 20%, and 7 days (13.7%, 28.4% above average) experienced a cloud cover that was between 80 and 100%. Most other days saw wide diurnal variation in percentage cloud cover with 28 days (54.91%, 7.3% above average) of days reaching a maximum cover of 100%. Generally on most active days the cloud cover produced good observing conditions. The eastern ridges were 40-100% occluded on 4 active days (9.8%, 37.7% below average) and the western ridges were 40-100% occluded on 10 days (19.6%, 32.5% below average). Hourly data from the Environment Canada weather station (Nakiska Ridgetop) situated 4 km west of the Hay Meadow site on Olympic Summit (Mount Allan) at 2543 m has not been available since 2011 so ridge wind information had to be estimated by observers. It should be noted that experience has demonstrated that wind velocities tend to be underestimated by observers located in the valley, and on cloudless days or when the ridges were cloaked in cloud estimating wind direction and velocity proved to be impossible. Observers assessed ridge winds to be from the SSW-W 62.7% (14% below average), WNW-NW 11.8% (17% above average), NW-NE 15.7% (366.3% above average), NE-S 2% (25% below average) and variable 7.8% of the time (135.2% above average). Most of the time, as usual, wind directions favourable to migration prevailed. Observers assessed these winds as calm to light (0-10 km/h) 19.6% of the time (24.8% above average), as light to moderate (1-40 km/h) 29.4% of the time (65.9% above average), as moderate (11-40 km/h) 11.8% (19.7% below average), as moderate to strong (11-100 km/h) 25.5% (6.3% below average), and as strong to very strong (40-100+ km/h) 13.7% (30.9% below average).

In summary the La Niña climatic conditions produced below-average temperatures throughout and especially in November when November 1 to 8 saw the coldest period of the whole count and November 1-3 the highest snowfall. Apart from the 6 completely lost days and the one severely curtailed day, however, observing and migration conditions were generally good with little precipitation, favourable sky conditions, clear ridges and significantly fewer strong to very strong winds.

General flight dynamics *September 20 to November 15*

The combined species total of 3672 is 8.9% below the long-term average for valid counts. (**Table 4**). The September count of 400 (**Table 5A**) was 20.9% below average; the October count of 3167 (**Table 5B**) was very close to average (+0.69%), and the November count of 105 (**Table 5C**) was the second lowest ever and 68.7% below average. Migrant raptors were recorded on 49 of the 51 active days between September 20 and November 15 which is the second lowest ever and 8.9% below average, although September 20 was the only zero count that was not weather related (**Table 2**). A total of 11 days (21.6%) had a passage of at least 100 migrants that occurred between September 30 and October 28, and the highest single-day count was 430 on October 6 which is close to the average (+1.2%) fall high count. The most persistent movement was 1324 birds on 7 days between October 4 and 10, of which 1244 (94%) were Golden Eagles.

The combined species median passage date of October 14 is 2 days later than the average for the count period September 20-November 15. Of the 11 species that occurred in sufficient numbers to calculate median passage dates (**Table 7**), 5 were earlier than average: Cooper's Hawk (1 day early), Northern Harrier and Sharp-shinned Hawk (2 days early), Northern Goshawk (3 days early) and Rough-legged Hawk (5 days early); and 7 were later than average: Red-tailed Hawk (1 day late), Golden Eagle and Merlin (2 days late), Bald Eagle (4 days late), Peregrine Falcon (5 days late) and Gyrfalcon (6 days late).

Of the 16 species recorded (**Table 4**), only 5 occurred in above average numbers and all only ever occur in low numbers at the site: Ferruginous Hawk 1 (+171.4%), American Kestrel 3 (+18.8%). Gyrfalcon 4 (+43.4%), Peregrine Falcon 7 (+17.7%) and Prairie Falcon 6 (+200%). Eleven species occurred in below average numbers: Osprey 2 (-26.9%), Bald Eagle 190 (-20.6%), Northern Harrier 6 (-43%), Sharp-shinned Hawk 82 (-40.4%), Cooper's Hawk 18 (-52.9%), Northern Goshawk 32 (-29%), Broad-winged Hawk 5 (-21.1%), Red-tailed Hawk 29 (-13.5%), Rough-legged Hawk 29 (-43.9%), Golden Eagle 3233 (-6%), and Merlin -35.8%. Turkey Vulture and Swainson's Hawk were not recorded having occurred previously on 1 and 6 previous counts within the current period respectively.

The final count was Turkey Vulture 0, Osprey 2, Bald Eagle 190, Northern Harrier 6, Sharp-shinned Hawk 82, Cooper's Hawk 18, Northern Goshawk 30, *Accipiter* sp. 3, Broad-winged Hawk 1, Swainson's Hawk 0, Red-tailed Hawk 29, Ferruginous Hawk 1, Rough-legged Hawk 29, *Buteo* sp. 10, Golden Eagle 3233, eagle sp. 8, American Kestrel 3, Merlin 5, Gyrfalcon 4, Peregrine Falcon 7, Prairie Falcon 6, *Falco* sp. 3, and indeterminate raptor 2, for a total of 3672 migrant raptors of 16 species.

Golden Eagle

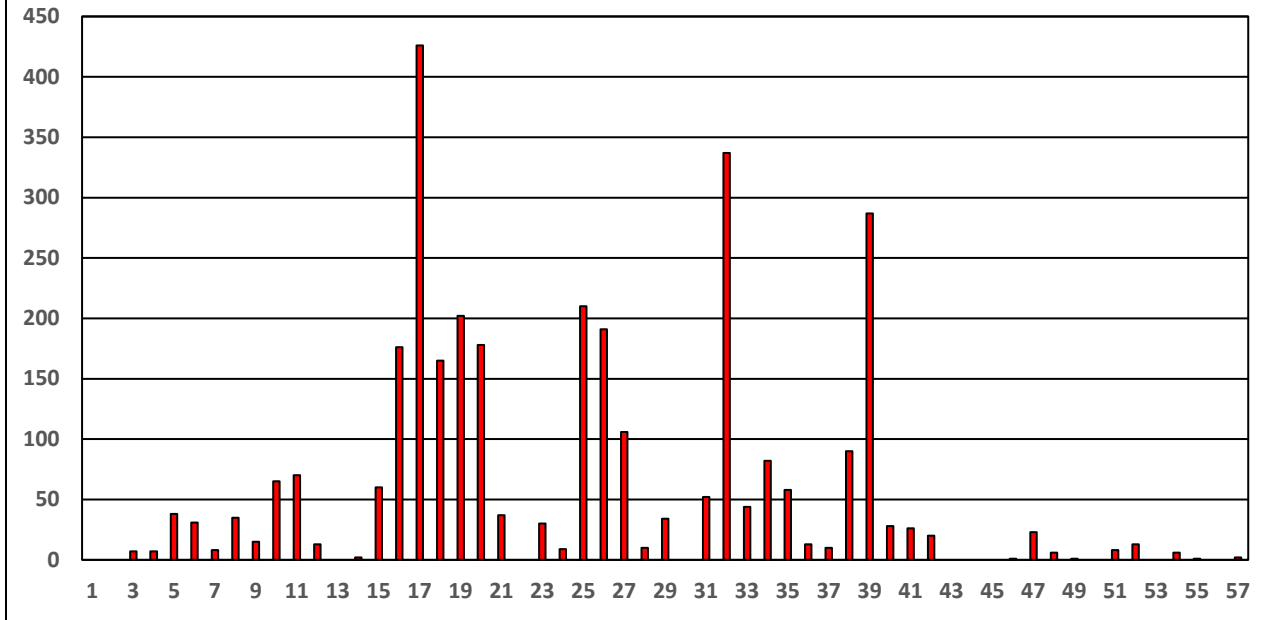
Observers counted a total of 3233 migrating Golden Eagles on 46 days between September 22 and November 15 (**Table 2** and **Figure 1**). The count is 6% below the long-term average of counts that are considered valid, and the number of days on which they occurred is 10.1% below average. The highest single-day count was 426 on October 6, which is 7.1% above the average maximum count. There were 10 days between October 5 and October 28 which saw movement in excess of 100 birds, 5 of which occurred between October 5 and 9 and involved 986 birds. As last year the migration was, with the exception of the low November count, reasonably evenly paced (**Figure 1**) and shows a distribution pattern close to those regularly recorded in the complete counts conducted at the site up to 2005. Birds moved in 6 waves each terminated by 1 to 3 days of bad weather that generally stopped all migration. Wave 1 of 289 birds was September 20-October 10, wave 2 which saw the peak movement of 1246 birds was October 3-October 10, wave 3 of 590 birds was October 12 to October 18, wave 4 of 596 birds was October 20 to October 26, wave 5 was October 27 to October 31, and wave 6 following 3 days of very

severe weather was November 4 to the end of the count on November 15 (**Figure 1** and **Figure 9**). The monthly counts (**Table 5**) show that 276 birds moved in September, which is 25% below average; 2896 moved in October (+3.5%) which is the highest October count since 2011, but only 61 birds were seen in November, which is the second lowest November count ever and 74.3% below average. Golden Eagles comprised 88% of the total count this season which, as last year, probably results from below-average counts of most of the other more common raptor species. The flight comprised 1344 adults, 132 subadults, 518 juveniles, 14 undifferentiated immature bird and 1225 birds of unknown age yielding an immature:adult ratio of 0.49 that is 69% above average and is the highest ever recorded at the site. The ratio of juvenile birds to subadults and adults was 0.35 which is 163.7% above average and is also the highest ever recorded at the site. Both ratios indicate a very productive breeding season.

The highest cumulative hourly counts were 408 (1000-1100), 362 (1100-1200), 356 (1200-1300, and 1300-1400) and 328 (1600-1700) MST. Ten birds were recorded between 0600 and 0700 and 29 birds occurred after 1800. (**Figure 2** and **Table 6**). The 5 highest single hour counts were 101 (October 28, 1000-1100), 74 (October 6, 1100-1200), 72 (October 6, 1400-1500), 72 (October 28, 1100-1200) and 67 (October 21, 1100-1200). Four of the highest 5 hourly counts occurred before 1200 and for the first time has produced a positively skewed distribution curve for a valid spring count (**Figure 2**) and very different from the almost perfect negatively skewed distribution curve peaking at 1500-1600 (MST) that was the cumulative hourly counts at the site between 1992 and 2005 (**Figure 3**).

The species median passage date of October 14 was 2 days later than the average date, adult birds were 1 day later than average on October 15, while immature birds were 1 day earlier than average on October 8.

**MOUNT LORETTE, GOLDEN EAGLE n = 3233 FALL 2017,
September 20 to November 15**



(1 = September 20, 12 = October 1, 43 = November 1)

Figure 1

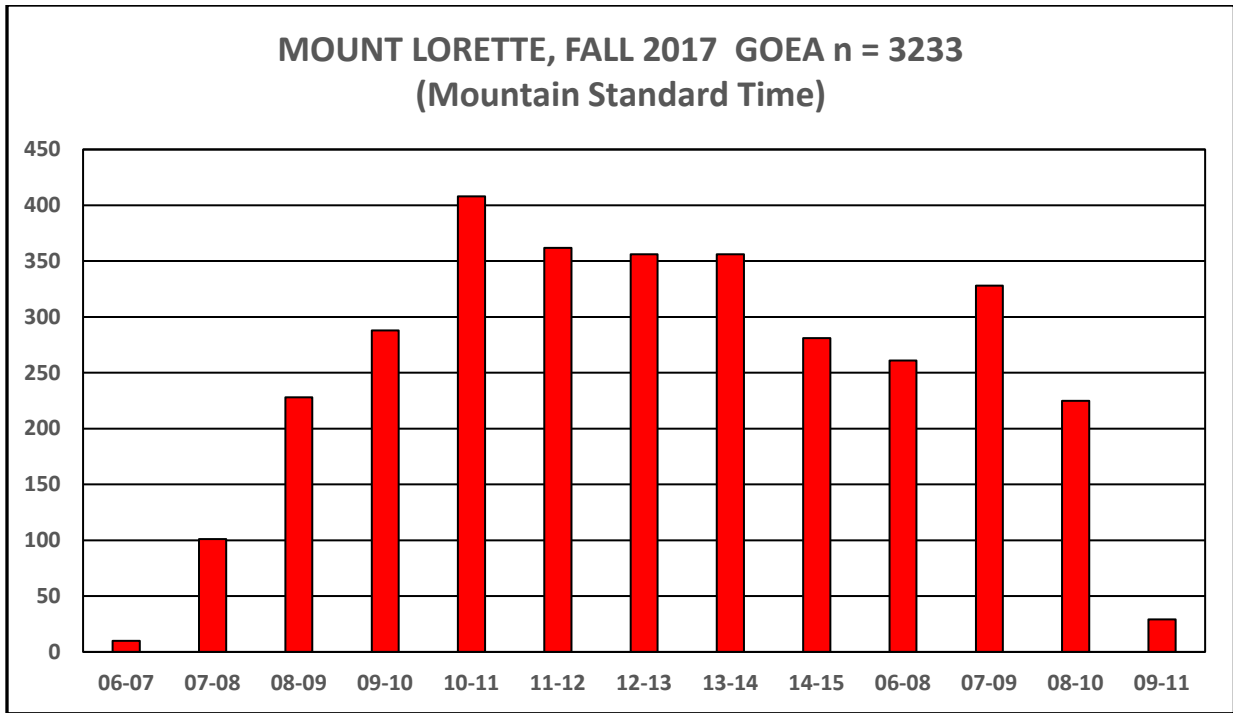


Figure 2

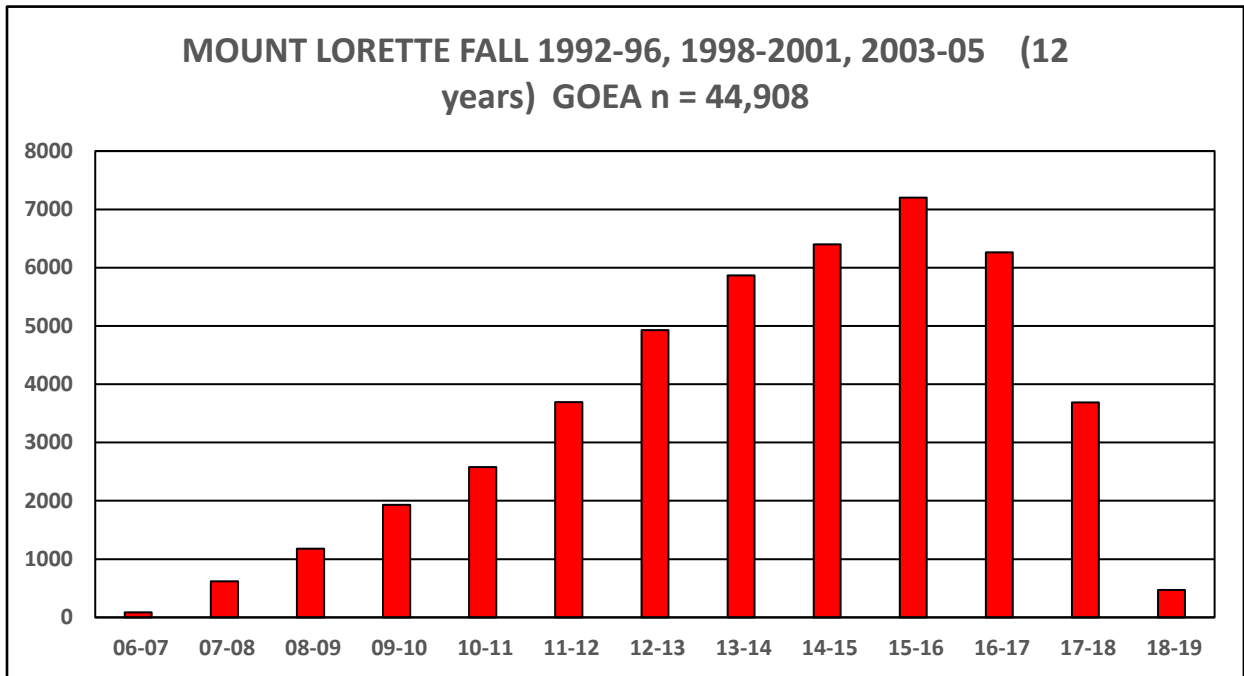


Figure 3

Fall Golden Eagle Trend

Figure 4 shows the linear trend of all counts at the site from 1993-2017 excluding 2002 when no count was possible, while **Figure 5** shows the trend excluding 2002 and the short counts of 2006, 2007 and 2008. Both show a clear diminishing trend with the removal of the short counts ameliorating but not significantly altering the trend. A similar trend is also seen in spring counts at the site after 1995. After a three-year increasing trend to 2015 and a slight decrease in 2016 this season's count marks a slight increase but does not alter the overall declining trend for the species at the site seen since 1993. This declining fall trend was also seen at a number of other sites in western North America up to 2005². In the Rocky Mountains region, both Mount Lorette (1993-2005), and the Bridger Mountains (Montana) (1992-2005) showed marginally significant declining trends, the Manzano Mountains (New Mexico) (1983-2005) showed a significant decline (especially since 1996), and the Wellsville Mountains (Utah) showed a significant decline since 1993. In the Intermountain Basin region the Goshute Mountains (Idaho) (1983-2005), Lipan Point (Arizona) (1991-2005) and the Grand Canyon combined count (Arizona) (1997-2005) all showed significant declines, while Boise Ridge (Idaho) (1993-2005) showed a non-significant increasing trend. With the exception of Boise Ridge (which has an average count of only 52 birds) the declines at all sites started in the early to mid-1990s.

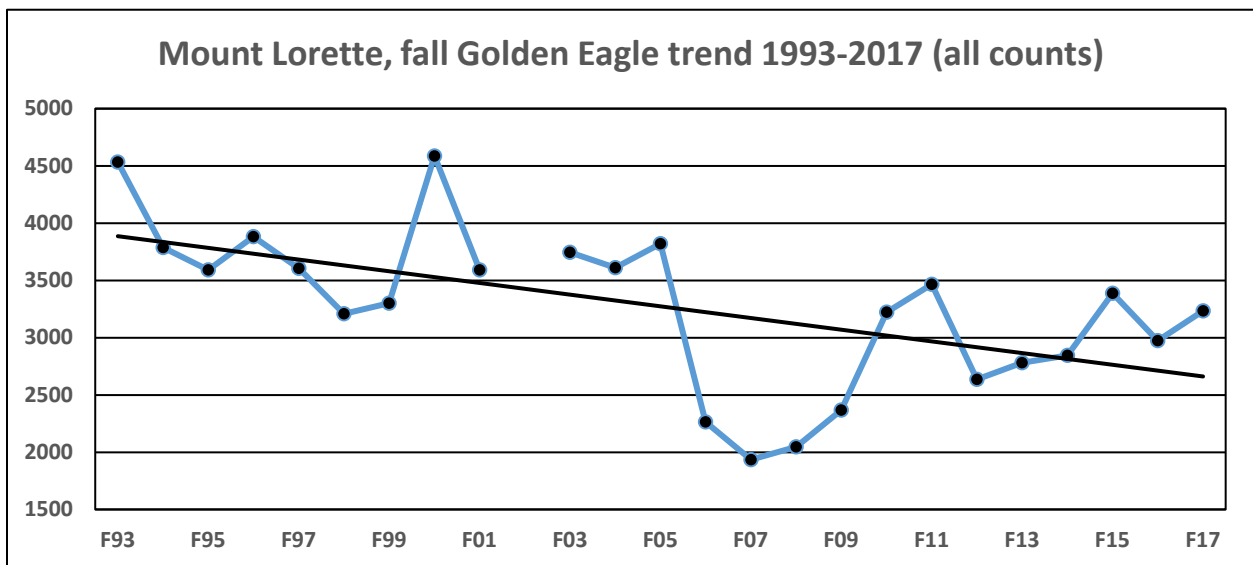


Figure 4

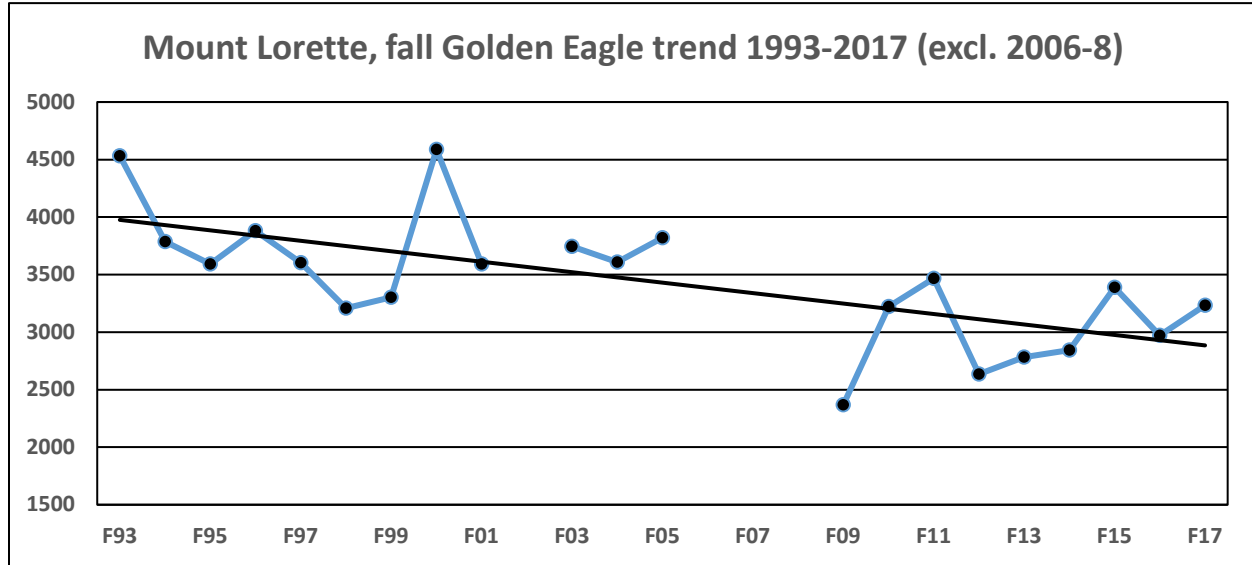


Figure 5

Golden Eagle Age Analysis

Figure 6 shows the trend of fall immature:adult ratios since 1994. Note that the 1997 count was at Plateau Mountain and the 2006-9 counts were at Piitaistakis-South Livingstone with the rest conducted at Mount Lorette. As the age ratios were found to be very similar between counts at Plateau Mountain, Piitaistakis-South Livingstone and Lorette, it is reasonable to combine data from three sites along the migration trend: when plotted, the points form a consistent trend pattern. There is a generally increasing trend to 1999, followed by a decrease to 2002, then a steady increase to 2007 followed by a decrease to 2012. The 2013 count showed the start of the next rising trend the ratio and, after a slight decline in 2015, the 2017 ratio continues and probably represents the height of the current rising trend. It is interesting to note that the 2017 ratio of 0.49 is only slightly lower than the culmination of the previous cycle in 2007 that was observed on the Piitaistakis-South Livingstone count. This trend (which is weakly paralleled by the spring trend) almost certainly reflects the reproduction cycles of the northern Snowshoe Hare population^(3, 4, 5). It is interesting to note that the fall 2000 spike in numbers (Figures 4 and 5) occurred a year after the apparent peak in the snowshoe hare cycle and may represent a more complete southward movement of a population at its peak resulting from an increasing dearth of a fall and winter prey species. This also raises the possibility that part of the apparent overall decline in the species seen at the site may result from progressively more birds wintering north of the counting sites as hare numbers recover (“shortstopping”), but even allowing for this it appears that numbers counted during the second cycle (i.e. after 2000) are significantly lower than the first (<1993-1999). It is unlikely that the current rising trend will continue and 2017 will probably mark the peak of the cycle, exactly 10 years after the previous peak in 2007. If so the

cycle peaks seen during the 26 years of Alberta Front Ranges counts will be 1999, 2007 and 2017 with 8 and 10 years respectively between the peaks.

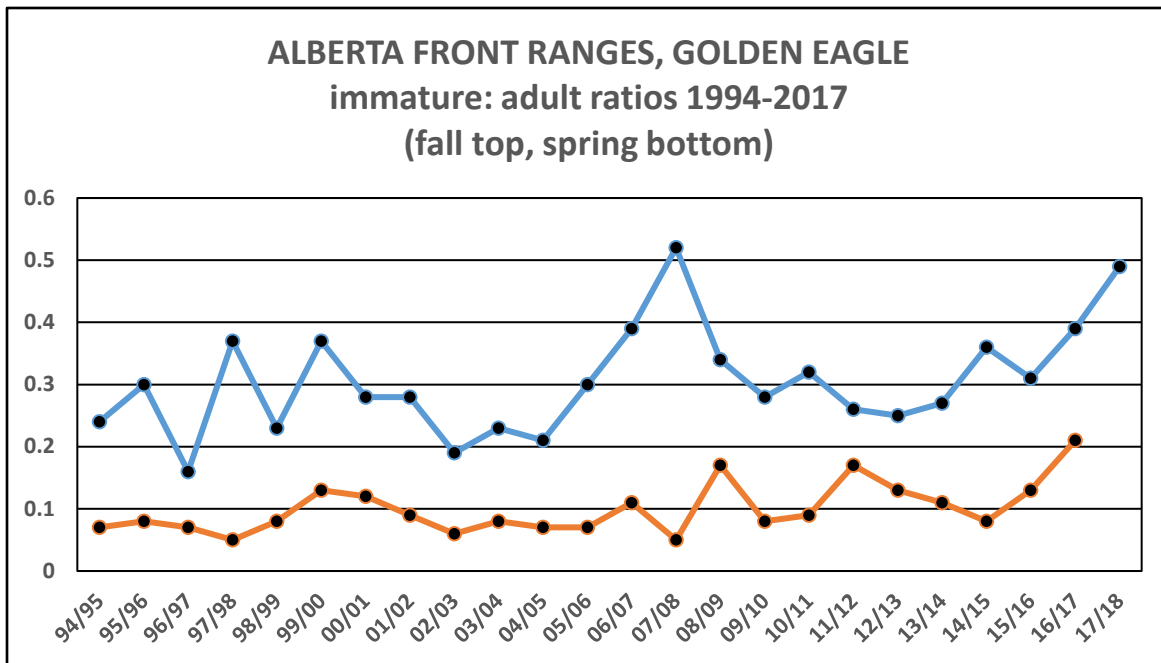


Figure 6

Bald Eagle

The count of 190 birds seen on 41 days between September 23 and November 14 was 20.6% below average (**Figure 7**). The 9 counts since 2009 have all been lower than those of 1993-2005 with the exception of 1999 (193 birds), and it is possible that increasingly warm autumns have resulted in water bodies to the north remaining ice-free later in the year resulting in delayed southward migration of the species. The idea that on mild years the species migrates later appears to be borne out by the high number of south-bound Bald Eagles seen after November 25 at the Beauvais Ridge count in 2011 and early 2012 documented in the fall 2011 report.

The monthly counts (**Table 5**) were 28 in September which is the highest count for the month since 2010 and 54.2% above average, 126 in October (-12.01%), and only 36 in November (-53.2%) which equals the second lowest November count ever at the site. Fifty-four birds (28.4%

of the total count) moved between October 27 and 29 culminating in the highest single-day count of 22 on October 29, 3.7% below the average high count. It is probable that the birds were moving ahead of a northern front that brought the most severe weather of the season during the first three days of November. The only other double figure counts were 12 on September 30 and 10 on November 11. The flight comprised 110 adults, 25 subadults, 47 juveniles, 5 undifferentiated immature birds and 3 birds of indeterminate age giving an immature:adult ratio of 0.41. The number of juvenile birds is the same as last year and again suggests a successful breeding season. The median passage dates for the species was October 27, for adults it was October 28, both of which were 4 days later than average, and for immature birds it was October 20 which was coincident with the average median passage date.

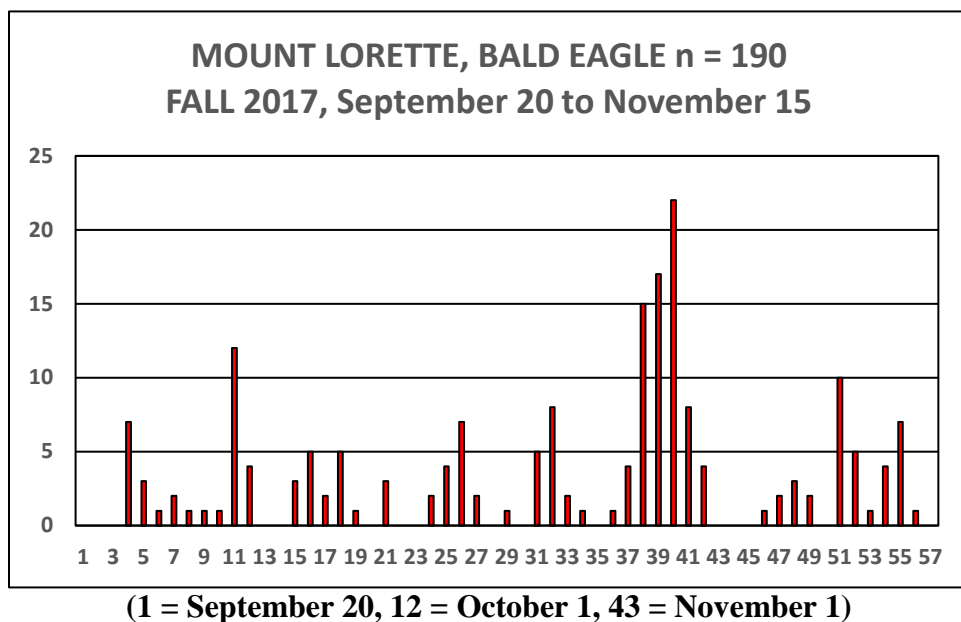


Figure 7

Other Species

Turkey Vulture Not recorded. A single bird seen on September 20, 1998 remains the only fall record of the species at the site during the current count period.

Osprey Two single birds were counted on September 22 and the relatively late date of October 28. The count is 26.9% below average.

Northern Harrier A total of 6 birds were seen on 5 days between September 23 and October 27, which is 43% below average. The highest daily count was 2 on October 8, and the median

passage date for the species was October 1 which was 2 days earlier than the long-term average date. The flight comprised 2 adult males, 2 undifferentiated female/juveniles and 2 juveniles).

Sharp-shinned Hawk The total of 82 birds were counted on 23 days between September 22 and November 10. The count is 40.4% below average and the number of days on which it occurred is 20.3% below average. The highest single-day count was 12 on September 30, which is 53.1% below the average maximum count, and was coincident with the species median passage date which was 2 days earlier than average. Adult birds were 4 days earlier than average on September 30 and juveniles were 7 days early on September 23. The flight comprised 21 adults, 4 juveniles and 57 birds of unknown age that gives an immature:adult ratio of 0.19 which is 52.8% below average although, as usual, the high percentage of unaged birds means that this figure should be treated with caution. The monthly counts were 44 in September (-23%), 37 in October (-51.1%), and 1 in November (-55%).

Cooper's Hawk A total of 18 birds moved on 12 days between September 25 and October 23, with a maximum passage of 3 birds on September 30. The count was 20.6% below average. The September count of 9 birds was 20.8% below average, the October count of 9 birds was 13.9% below average and no birds were seen in November. The flight comprised 1 adult, 5 juveniles and 12 birds of indeterminate age. As last year the median passage date for the species was September 30, 1 day earlier than average.

Northern Goshawk A total of 30 goshawks migrated on 16 days between September 22 and October 28, a total which is 32.4% below average for the site. The highest single-day count was 5 on October 8 which is 11.2% below the average high count. The September count was 10 (+31%), the October count was 17 (-42.3%) and the November count of 3 was 53.4% below average. The flight comprised 15 adults, 6 juveniles and 9 birds of unknown age giving an age ratio of 0.4 which is 52.5% above average. The median passage date for the species was October 8, 3 days earlier than average, adults were 3 days later than average on October 14 and juvenile birds were 4 days later than average on October 7.

Broad-winged Hawk Just 1 adult light morph Broad-winged Hawk was seen on September 30, a count that is 84% below average.

Swainson's Hawk The species was unrecorded this year. It has only occurred on six previous years within the present count period.

Red-tailed Hawk The count of 29 birds on 16 days between September 22 and October 23 was 13.5% below average. The highest daily count was 4 on October 7, which is 44.5% below average. The September count of 15 was 17.2% below average, the October count of 14 was close to average (-0.4%) and no birds were seen in November. The median passage date for the species and for adult birds were both 1 day later than average on September 30. The flight comprised 27 birds of the race *B.j.calurus*, 2 of which were light morphs (15 adults, 3 juveniles and 4 indeterminate birds) and 5 were dark morph birds (2 adults, 3 indeterminate); 1 very light indeterminate bird was considered to be a "Kridler's Hawk" (*B.j. borealis* var *krideri*) and there was 1 adult dark morph "Harlan's Hawk" (*B.j. harlani*). The overall immature:adult ratio was 0.17 which is 63.5% below average.

Ferruginous Hawk An adult light morph bird was recorded on October 7. Single birds have been recorded on seven previous counts.

Rough-legged Hawk A total of 29 birds moved on 18 days between September 29 and November 11, which is 43.9% below average and the 4rd lowest ever fall count at the site. The single-day high count was 6 on October 8 which is 39% below the average high count. The September count of 3 was 67.6% above average, the October count of 24 was 43% below average and the November count of 2 was 68.4% below average. The median passage date for the species was 5 days earlier than average on October 13. Sixteen birds were identified as light morphs and 13 as dark morphs giving a dark:light ratio of 0.81, which is ostensibly 190% above the average ratio but is clearly wrong and probably results from distant silhouetted birds being erroneously identified as dark morph birds. By comparison the 515 Rough-legged Hawks counted on Vicki Ridge yielded a dark:light ratio of 0.08.

American Kestrel Three birds, 2 males and 1 female, were seen on 2 days between October 10 and the relatively late date of October 21 when 2 birds (1 male and 1 female) were seen. The total is 18.8% above average.

Merlin The total of 5 Merlins occurred on 5 days between September 23 and October 21 was 35.8% below average. Two birds moved in September (-30.9%) and 3 in October (-34.1%). The median passage date for the species was October 7, 2 days later than average. The flight comprised 3 birds ascribed to the race *F.c.columbarius* (1 female/juvenile bird and 2 of indeterminate sex or age), 1 indeterminate bird of the race *F.c.richardsonii*, and 1 bird of indeterminate race, age or sex.

Gyrfalcon A total of 4 grey morph birds were seen on 3 days between October 10 and October 28 when 2 birds occurred. The total is 43.4% above average. The median passage date was October 23, 6 days later than average.

Peregrine Falcon A total of 7 birds was counted on 5 days between September 23 and October 27, with 2 birds seen on both September 23 and October 10. The count is 17.7% above average. Three birds moved in September (+72.7%) and 4 in October (+17.6%). The flight comprised 2 adults, 2 juveniles and 3 birds of indeterminate age, giving an age ratio of 1.0 (22.4% above average). The species median passage date of October 10 was 5 days later than the long-term average date.

Prairie Falcon The total of 6 Prairie Falcons seen on 4 days between October 1 and 24 was the highest count ever for the site and 200% above average. Two birds were seen on both October 1 and 24. The median passage date was October 14.

Observers at Mount Lorette

Principal Observers Blake Weis (12 days), Joel Duncan (10 days), Jim Davis (8.5 days), Bill Wilson (8.5 days), Caroline Lambert (7 days), George Halmazna (6 days) and Cliff Hansen (3 days)

Assistants Lori Anderson (10 days), Dan Parliament (9 days), Ruth Morrow (7 days), Rick Robb (7 days), Caroline Lambert (5 days), Patrick Farley (3 days), Cliff Hansen (3 days), Chris Hunt (2 days), Joel Duncan (1 day), Heinz Unger (1 day), Cindy Parliament (1 day), Blake Weis (1 day), Michael Woertman (1 day).

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Vicki Ridge, Alberta (Peter Sherrington)

Introduction

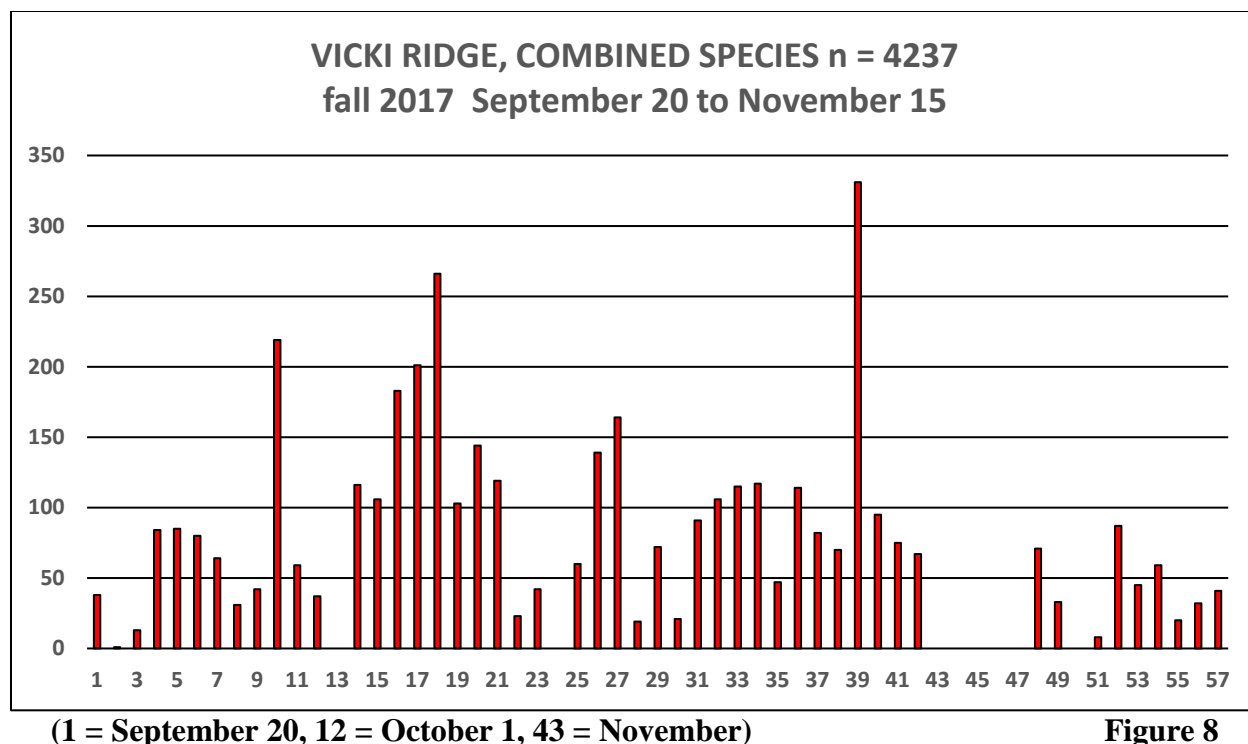
Vicki Ridge is a NNW-SSE oriented foothills ridge located 4.5 km WNW of the Hamlet of Beaver Mines in SW Alberta. It is 17 km SSE of the Piitaistakis-South Livingstone site and monitors some of the birds that would have passed south along the Livingstone Range in the fall. The high point of the ridge is 1670 m and most observation was conducted near the south end of the ridge at 1533 m (49° 27' 59" N 114° 15' 13" W). On very windy or other adverse weather days observation is conducted from the end of a well-site access road about 400 m immediately west of the southern end of the ridge at 1418 m. Access to the ridge is from the Seven-Gates Road which goes west from Highway 507 1 km NW of Beaver Mines. The ridge top is a very easy climb from the road and affords excellent 360° views. The ridge has been well-known to locals for a number of years as a good place to observe raptors but no systematic counts had previously been conducted there. In 2014 the site was sporadically occupied on 11 days between October 5 and November 8 for a total of 37.28 hours at an average of 3.39 hours a day. The count yielded a total of 405 migrants of 13 species at an average rate of 10.87/hour (**Table 10**). In 2015 a second count was conducted on the ridge with a fairly continuous coverage of 32 days (134.8 hours) between September 22 and November 15 during which time 1340 raptors of 15 species were counted at a rate of 9.94 raptors/hour (**Table 10**). In 2016 a full (September 20-November 15) was planned but because of an unexpected but important circumstance I had to be away for 12 days between September 29 and October 10 and only 1 day's count was conducted during this period. The final count comprised 43 days (282.5 hours) between September 23 and November 15 but because of the aforementioned gap the statistical usefulness of the count was limited but it served as a useful extended reconnaissance and yielded 2868 migrant raptors of 18 species at a rate of 10.15 raptors/hour (**Table 10**). The fall 2017 count of 52 days (418.9 hours) was the first "complete" count at the site. Birds migrating south above the eastern edge of Kyllö ridge which runs parallel to and west of Vicki Ridge can be monitored both from the ridge-top

and from the well-site, but birds moving along the western edge of Kyllø Ridge cannot be seen. This season the western edge of Kyllø Ridge near or north of the Waterton 68 well (about 2 km W of Vicki Ridge) was monitored on 12 days (mainly between October 16 and 30) by Raymond Toal and Denise Cocciolone-Amatto, and by Gord Petersen and the results were combined with those from Vicki Ridge in order to get a clearer picture of fall movement along the complete ridge system (**Table 8**).

Weather and count summary

Table 9 summarizes the weather at the site. A total of 5 days were completely lost to poor weather conditions: October 2 and 13, and November 1, 2 and 3. On active days rain and snow fell on 1.5 days (28.8%), snow on 5 days (9.6%), and rain on 1 day (1.9%) and in the morning of 1 day it was also foggy, so 22 days (42.3%) experienced some form of precipitation, but it rarely interrupted observation. September high temperatures averaged 13.1 °C (range 22 to 4), October averaged 9.1 °C (range 16 to 3) and November was cold averaging -2.9 °C (range -15 to 6). The most common wind direction was WSW-W on 35 days (68.6%) followed by W-NW on 6 days (11.5%), and winds gusted to at least 40 km/h on 35 days (67.3%). The 20 days between October 9 and 28 saw winds constantly gusting above 40 km/h that peaked at 110 km/h on October 25. Conditions were therefore generally favourable for migration even though observing the migrants was often uncomfortable. Despite no birds being seen for the first 5 days of November because of the weather, movement recovered and 396 migrants were counted during the month including 153 Bald Eagles and 195 Golden Eagles. The daily observation locations are noted on **Table 9**.

The final count was a record 4237 migrant raptors of 17 species at an average rate of 10.2 raptors/hour (**Tables 8 and 10**), with high daily counts for each month of 219 birds on September 29, 331 on October 28, and 87 on November 10. All but 2 active viewing days (November 4 and 8) produced migrant raptors with an average daily count throughout the season of 81.5 birds. September produced 716 migrants, October 3125 and November 396 and the combined-species median passage date was October 15, one day later than at Mount Lorette. The final count of 4237 migrants of 17 species was 0 Turkey Vultures, **11** Ospreys, **350** Bald Eagles, **19** Northern Harriers, **751** Sharp-shinned Hawks, **94** Cooper's Hawks, **109** Northern Goshawks, 6 unidentified *Accipiters*, **33** Broad-winged Hawks, **1** Swainson's Hawk, **234** Red-tailed Hawks, **6** Ferruginous Hawks, **515** Rough-legged Hawks, 19 unidentified *Buteos*, **2001** Golden Eagles, 18 unidentified eagles, **21** American Kestrels, 20 Merlins, **5** Gyrfalcons, **17** Peregrine Falcons, **5** Prairie Falcons and 2 unidentified falcons. New high counts for the site were established for 16 species (in bold above), and the count of 515 Rough-legged Hawks was a new high for any RMERF site.

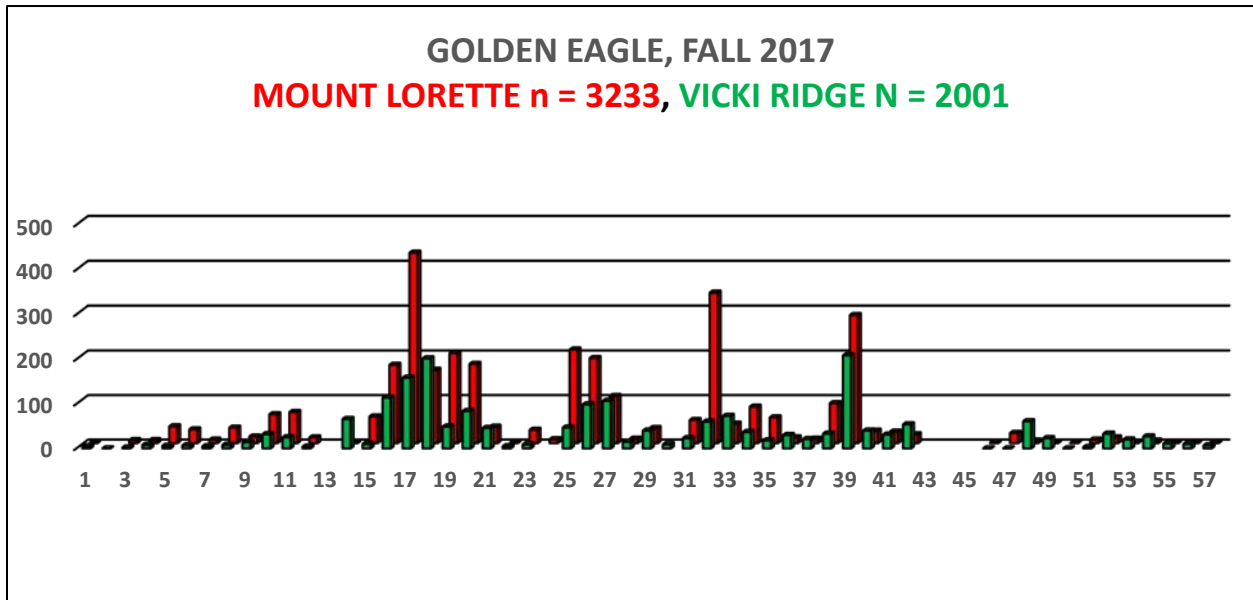


Comparison of Eagle Species at Vicki Ridge and Mount Lorette

At Mount Lorette birds moved in 6 waves each terminated by 1 to 3 days of bad weather that generally stopped all migration. Wave 1 of 289 birds was September 20-October 10, wave 2 which saw the peak movement of 1246 birds was October 3-October 10, wave 3 of 590 birds was October 12 to October 18, wave 4 of 596 birds was October 20 to October 26, wave 5 was October 27 to October 31, and wave 6 following 3 days of very severe weather was November 4 to the end of the count on November 15 (**Figure 1** and **Figure 9**). The equivalent counts for Vicki Ridge where essentially the same waves were experienced over slightly different time periods were wave 1 116 (-40.1%), wave 2 (October 3-12) 744 (-59.7%), wave 3 (October 14-19) 317 (-53.7), wave 4 (October 20-27) 295 (-49.5%), wave 5 (October 28-31) 334 (-74.1%) and wave 6 (November 6-15) 195 (+319.7%). **Figure 9** clearly shows the coincidence of the waves at both sites but shows consistently lower numbers at Vicki Ridge in September and October, but higher numbers throughout November. The “missing” Golden Eagles are presumed to have moved south on ridges west of the Vicki and Kylo Ridges, which includes Carbondale Ridge that can be seen from the west Kylo Ridge site but distance prevents consistent counting of the birds from there.

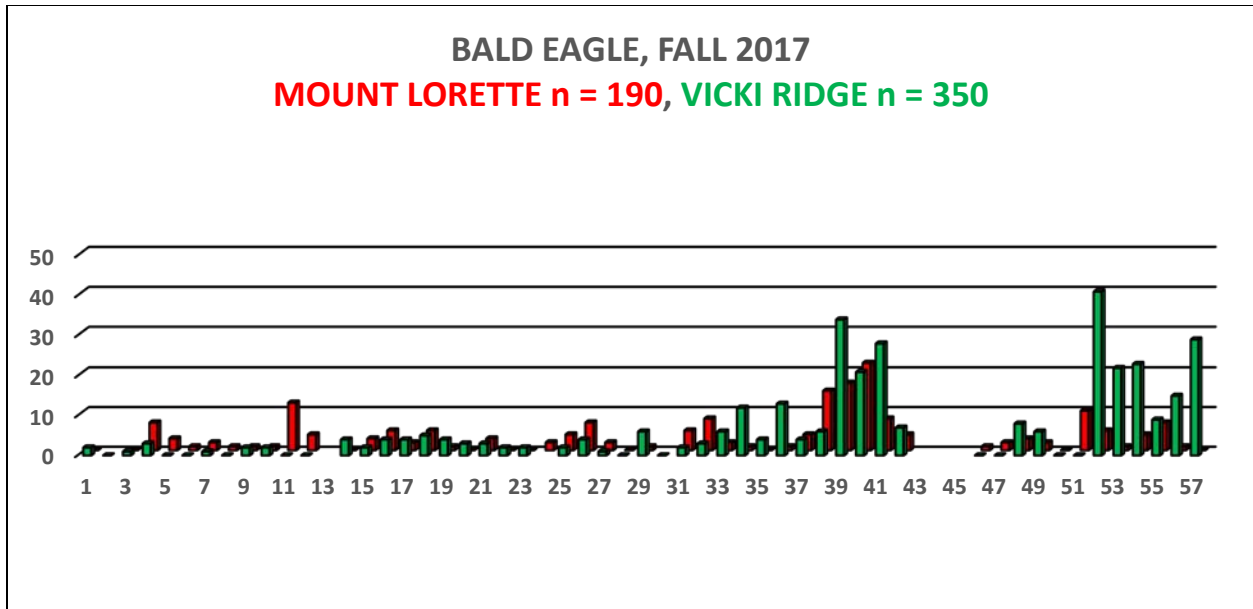
By contrast over twice as many Bald Eagles were counted at Vicki Ridge (350) than at Mount Lorette (190). Figure 10 shows a persistent migration of low numbers of Bald Eagles at both sites up to the end of October when there is a more-or less coincident peak at both sites with 129

birds moving between October 23 and 31 at Vicki Ridge and 70 birds seen between October 26 and 31 at Mount Lorette. It is probable that these birds were moving ahead of a slow-moving northern front that brought the severe weather that closed down both sites for the first three days of November. Movement only recovered slowly after November 3, but the strongest movement of the season involving 139 birds occurred between November 10 and November 15 at Vicki Ridge, which started with the season-high count of 41 birds on November 10. At Mount Lorette, birds continued to move in low numbers throughout November with only one day (November 11) reaching 10 birds. It is probable that the low temperatures at the beginning of November froze much of the open water on lakes and rivers to the north of the sites and triggered an exodus of Bald Eagles as waterfowl moved south in huge numbers and fish became safe from predation under ice-layers. It is also likely that this movement was largely along the foothills ridges and therefore passed to the east of the Mount Lorette site.



(1 = September 20, 12 = October 1, 43 = November 1)

Figure 9



(1 = September 20, 12 = October 1, 43 = November 1)

Figure 10

Species Accounts

Turkey Vulture The species was not recorded this year.

Osprey A count high total of 11 birds were counted on 10 days between September 22 and October 28, with 2 occurring on September 23. The median passage date was September 28.

Bald Eagle A count high total of 350 birds moved on 40 days between September 20 and November 15, with 153 of the birds (43.7%) recorded in November including a single-day high count of 41 on November 10, and 243 birds (69.4%) migrated between October 28 and November 15. The flight comprised 206 adults, 54 subadults, 62 juveniles, 1 undifferentiated immature bird and 27 indeterminate birds giving an immature:adult ratio of 0.57 (compared to 0.41 at Mount Lorette). The median passage date for the species and for immature birds was October 30, and was October 29 for adult birds.

Northern Harrier A count high total of 16 birds occurred on 15 days between September 22 and October 30, with a single-day high count of 5 on September 29. The flight comprised 9 adults (3 males, 6 females), 9 juvenile birds (4 males, 3 females and 2 of undetermined sex), and 1 unaged male bird, giving an overall age ratio of 1. The species median passage date was October 1, adults were October 7 and juveniles were September 29.

Sharp-shinned Hawk A count high total of 751 birds occurred on 37 days between September 20 and November 12, with a single-day high count of 133 on September 29. A total of 368 birds were counted in September, 382 in October and only 1 in November. The count comprised 438 adults, 29 juveniles and 284 indeterminate birds, giving an immature:adult ratio of 0.07 although the high number of unaged birds means that the figure should be used with caution. The median passage date for the species and for adults was October 1, and for immature birds it was September 24.

Cooper's Hawk A count high total of 94 birds occurred on 31 days between September 20 and October 29, with a single-day high count of 9 on September 29. The flight comprised 62 adults, 10 juveniles and 22 indeterminate birds, which gives an immature:adult ratio of 0.16. The species median passage date was September 29, adults were October 1 and immature birds were September 24.

Northern Goshawk A count high total of 109 birds occurred on 42 days between September 20 and November 14, with a single-day high count of 8 on October 28. The flight comprised 77 adults, 19 juveniles and 13 indeterminate birds, which gives an immature:adult ratio of 0.33 (compared to 0.4 at Mount Lorette). The species and adult median passage dates were October 12, and immature birds was October 4.

Broad-winged Hawk A count high total of 33 birds occurred on 13 days between September 23 and October 23, with a single-day high count of 6 on October 5. The flight comprised 29 light morph birds (16 adults, 10 juveniles and 3 indeterminate) and 4 dark morphs (1 adult and 3 juveniles), giving an immature:adult ratio of 0.76. The species and adult median passage dates were October 3, and that for immature birds was September 29.

Swainson's Hawk The only record, which was the first for the site, was an adult light morph bird on September 20.

Red-tailed Hawk A count high total of 234 birds occurred on 33 days between September 20 and October 31, with a single-day high count of 43 on October 4. The flight comprised 194 birds of the race *B.j.calurus*, 136 of which were light morphs (119 adults, 12 juveniles and 5 indeterminate birds), 2 rufous (intermediate) morphs (1 adult, 1 juvenile), and 56 dark morphs (42 adults, 9 juveniles and 5 indeterminate birds); 39 birds were of the race *B.j.harlandi*, 37 of which were dark morphs (26 adults and 11 juveniles) and 2 were adult light morph birds; and 1 bird was of indeterminate race, morph or age. The overall immature:adult ratio was 0.17. The species and adult median passage dates were October 4, and that for immature birds was October 1.

Ferruginous Hawk A count high total of 6 birds occurred on 5 days between September 20 and October 25, with a single-day high count of 2 on September 29. The flight comprised 2 light morphs (1 adult, 1 juvenile), 1 adult intermediate morph and 3 adult dark morph adults, giving an immature:adult ratio of 0.2. The species and adult median passage dates were both September 29.

Rough-legged Hawk A count high total of 515 birds were observed on 36 days between September 26 and November 15, and the highest single-day count was 63 on October 28. The flight consisted of 457 light morphs, 35 dark morphs and 23 undetermined morphs giving a light:dark ratio of 0.08. The total is also the highest ever for a RMERF count.

Golden Eagle A count high total of 2001 birds occurred on 47 days between September 20 and November 15, with a single-day high count of 209 on October 28. Other three-figure counts were 114 on September 5, 159 on September 6, 202 on September 7 and 107 on September 16. The September count was 112, October yielded 1694 birds and 195 moved in November. The flight comprised 1095 adults, 154 subadults, 494 juveniles and 258 indeterminate birds, which gives an immature:adult ratio of 0.59 and a juvenile: adult/subadult ratio of 0.32 compared to ratios of 0.49 and 0.35 respectively at Mount Lorette. The species median passage date was October 15, the adult median passage dates was October 21, and that for immature birds was October 8.

American Kestrel A count high total of 21 birds occurred on 11 days between September 20 and October 24, with a single-day high count of 5 on September 29. The flight comprised 8 males, 9 females and 6 birds of undetermined sex giving a female:male ratio of 0.88. The median passage date for the species was September 28.

Merlin Twenty Merlins were seen on 14 days between September 20 and October 21 with single-day high counts of 3 birds on September 25, October 10 and October 21. The flight comprised 17 birds ascribed to the race *F.c.columbarius* (7 adult males, 9 adult females, 1 undifferentiated female/juvenile and 1 bird of unknown age or sex) and 2 birds of the race *F.c.richardsonii* (1 adult male and 1 undifferentiated female/juvenile bird). The median passage date for the species was September 28.

Gyr Falcon A count high total of 5 birds occurred on 5 days between the very early date of September 22 and November 12. The flight comprised 4 grey morphs (1 adult male, 1 adult female and 2 indeterminate birds) and 1 indeterminate black morph bird. The species median passage date was October 29.

Peregrine Falcon A count high total of 17 birds occurred on 5 days between September 22 and October 21. The flight comprised 10 males (8 adults, 2 juveniles) and 6 females (4 adults, 1 juvenile and 1 indeterminate) and 1 bird of indeterminate sex or age, giving an immature:adult ratio of 0.25. The median passage date for the species was October 7.

Prairie Falcon A count high total of 5 birds occurred on 5 days between October 6 and November 7. The species median passage date was October 25.

Also recorded were 6 undifferentiated *Accipiters*, 19 undifferentiated *Buteos* (2 light, 10 dark and 7 of undetermined morph), 18 undifferentiated eagles and 2 undifferentiated Falcons.

Observers at Vicki Ridge and Waterton 61 Wellsite

Principal Observers Peter Sherrington (50.5 days), Denise Cocciolone-Amatto and Raymond Toal (1 day), Gord Petersen and Raymond Toal (0.5 days),

Assisted by Raymond Toal (14 Days), Denise Cocciolone-Amatto (7 days), Gord Petersen (5 days), Trevor Lewis (3 days), Mark Sherrington (2 days), Doug and Teresa Dolmen (2 days), Klaus Exener (1 day), Pat Lucas (1 day), Connie Simmons and Phil Hazelton (1 day).

Observers at Kylo Ridge and Waterton 68 Wellsite

Raymond Toal (7 days), Gord Petersen (3 days), Raymond Toal and Denise Cocciolone-Amatto (2 days)

Steeple Ridge extended reconnaissance count, British Columbia (Vance Mattson)

Introduction

In the fall of 2009 Vance Mattson conducted the first extended reconnaissance count at or near the Steeples Ridge which is located on the east side of the Kootenay Valley that forms part of the Rocky Mountain Trench 25 km NE of Cranbrook, British Columbia. Three sites were used to monitor raptor movement along, or just north of, the NNW-SSE oriented Steeples ridge which forms the southern part of the Hughes Range on the western flank of the Rocky Mountains. Of potential significance is that it is located about 80 km almost due west of the Piitaistakis-South Livingstone site giving the possibility of simultaneously monitoring movement along the eastern and western flanks of the Rocky Mountains at the same latitude. This year, 31 of the 41 days in the field were spent at the Bill Nye site (49° 45' 11.10"N, 115° 38' 49.14"W, at 1041m). The site, located beneath a prominent 'scar' on the face of the mountain) can be accessed from Wasa Lake by following Lazy Lake Road east toward Lazy Lake. It is located south of an unmarked back road approximately 10km from the Lazy Lake Road turn off on Wasa Lake Park Drive on the southern edge of Wasa Lake. The site is located about 5 km southeast from the back road turnoff, although it may require detailed instructions to arrive there. The site offers views of the birds as they pass over, or in front of, the ridge. 'Scarface Peak' (2400m) is the most westerly and visibly craggy peak of Mount Bill Nye (2600m). Two days (October 7 and November 11) were spent at the Bull Mountain site, 3 days (October 16, 26 and 30) were at the South Lakit site, 4 days were spent near the Kootenay River during periods of very poor weather when the

mountains were obscured, and 1 day (November 6) was spent at Lone Peak which is about 1 km south of the South Lakit site.

The fall 2017 season is the ninth reconnaissance count at the site (**Table 13**), and comprised 41 days and 185 hours of observation. The days in the field equaled the previous high effort in 2009 and is 36.9% above the average count, and the hours are the longest fall effort and are 72.6% above average.

Weather and count summary

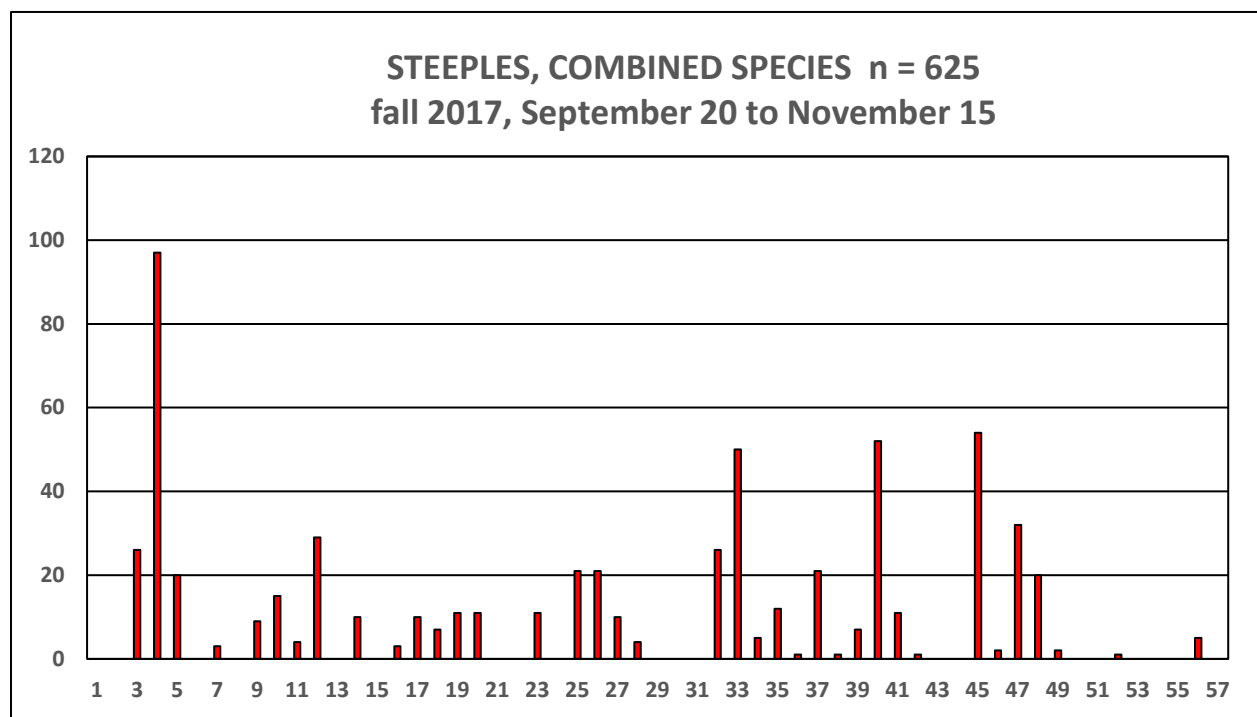
The fall 2017 season is the ninth reconnaissance count at the site (**Table 13**), and comprised 41 days and 185 hours of observation between September 22 and November 15. The days in the field equaled the previous high effort in 2009 and is 36.9% above the average count, and the hours are the longest fall effort and are 72.6% above average. A total of 7 days were lost because of inclement weather (September 21, October 13, 19, November 2, 9, 12, 15), and another 9 days (September 20, 25, 27, October 2, 4, 11, 18, November 1, 8) were missed due to the teaching commitments of the Principal Observer. **Table 12** summarizes the weather at the site. The mountains were obscured during all the days lost to weather, and 2 were accompanied by rain and snow, 2 by snow and 1 by persistent rain. Rain fell on 7 active days, but was usually light and not persistent, and snow fell on 3 days mainly in the form of flurries. The average high temperature for September was 14.9 °C (range 10 to 24 °C), for October it was 11.56 °C (range 5 to 18 °C) and November was much cooler with an average of -0.4 °C (range 5 to -6 °C). Conditions were assessed as calm 41.5% of the time, W-SW winds 29.3%, S-W winds 19.5%, NE-E 7.3% and NW 2.4%. Wind velocity were assessed as calm to light 53.7% of the time, light to moderate 12.2%, moderate 7.3%, moderate to strong 19.5%, and strong to very strong 7.3%. The mountain ridges on active days were assessed as clear 63.4% of the time, mainly clear 4.9%, partially obscured 19.5% and obscured 12.2% mostly in November when most of the migrants were seen in the centre of the valley near the Kootenay River.

A total of 625 raptors were counted which is just 4 less than last year's fall record and is 87.5% above average, but the passage rate of 3.38/ hour is only 7.75% above average reflecting the higher number of hours spent in the field this season (**Table 13**). The highest daily count was 97 on September 23 that included 34 Sharp-shinned Hawks and 35 Red-tailed Hawks, and was a new record high count for September. The peak migration period occurred between October 21 and November 6 when 296 migrants were counted that made up 47.4% of the total. This is generally later than in previous years, and in each of the previous three counts October 11 was the highest single-day total and consisted primarily of eagles (**Figure 11**). In 2016 the period October 6-17 saw a total of 336 migrants or 53.4% of the total count.

As usual eagles again dominated the count (68%) comprising 276 Bald Eagles (44.2%), 146 Golden Eagles (23.4%) and 3 unidentified eagles, which is the same percentage as last year. Both are lower than the previous average of 82% largely resulting from the higher numbers of Sharp-

shinned Hawks and Red-tailed Hawks seen in the last two counts. The Bald Eagle count is the highest ever at the site and there were also record counts for Northern Harrier (16), Northern Goshawk (13), Broad-winged Hawk (5), Red-tailed Hawk (51), Rough-legged Hawk (15) and American Kestrel (8), while Osprey (7), Merlin (2) and Peregrine Falcon (2) equaled high totals for the site.

The final count of 625 raptors of 14 species was 1 Turkey Vulture, 7 Ospreys, 276 Bald Eagles, 16 Northern Harriers, 78 Sharp-shinned Hawks, 1 Cooper’s Hawk, 13 Northern Goshawks, 5 Broad-winged Hawks, 51 Red-tailed Hawks, 15 Rough-legged Hawks, 1 unidentified *Buteo*, 146 Golden Eagles, 3 unidentified eagles, 8 American Kestrels, 2 Merlins and 2 Peregrine Falcons.



(1 = September 20, 12 = October 1, 43 = November 1)

Figure 11

Turkey Vulture The only record was a single bird on September 26.

Osprey Seven single birds moved between September 23 and the late date of November 3 The total equals last year’s record count and is 250% above average.

Bald Eagle The 276 birds counted between September 23 and November 14 is a new high count at the site and is 93.3% above average. The highest single-day counts were 38 on November 3

and 29 on October 22. The flight comprised 155 adults, 16 subadults, 101 juveniles and 4 indeterminate birds giving an immature:adult ratio of 0.82, double that of the ratio of 0.41 at Mount Lorette.

Northern Harrier The total of 16 birds counted between September 22 and November 3 was a new high for the count and 433% above average. The highest single-day count was 4 on September 23 but 3 late birds on November 3 was notable. The flight comprised 6 adult females, 10 unsexed juveniles.

Sharp-shinned Hawk The total of 78 birds seen between September 22 and October 26 was the second highest ever count for the site and 146% above average. The highest single-day count was 34 on September 23, and the September count of 61 birds comprised 78.2% of the total. The flight comprised 27 adults, 6 juveniles and 45 indeterminate birds.

Cooper's Hawk A single juvenile bird occurred on September 29. This is only the fourth count on which they have been recorded: 4 were seen in 2009, 2 in 2015 and 2 in 2016.

Northern Goshawk A count high total of 13 birds moved between September 22 and November 5, with a single-day high count of 3 on October 29. The total is 259% above average. The flight comprised 9 adults and 4 juveniles.

Broad-winged Hawk The 4 single birds counted between September 23 and September 29 and the single bird seen on October 22 were new to the count. The flight comprised 4 light morphs (2 adults and 2 juveniles) and 1 unaged dark morph bird.

Swainson's Hawk Never recorded on the count.

Red-tailed Hawk A record total of 51 birds (194% above average) occurred between September 23 and November 5 and comprised 46 birds of the race *B.j.calurus* (39 light morphs: 23 adults, 8 juveniles, 8 unaged; 4 dark morphs: 3 adults, 1 juvenile and 3 rufous (intermediate) morphs (2 adults, 1 juvenile); 4 adult dark morph *B.j.harlani*, and 1 bird of unknown race, morph or age. The highest single-day count was 35 on September 23 that comprised 68.6% of the total count.

Ferruginous Hawk Never recorded on the count.

Rough-legged Hawk A count high total of 15 birds (161% above average) moved between October 1 and November 10, with a single-day high count of 3 on October 22. The total comprised 12 light morph and 3 dark morph birds.

Golden Eagle The total of 146 birds counted between September 22 and November 14 comprised 99 adults, 7 subadults, 37 juveniles and 3 indeterminate birds giving an immature:adult ratio of 0.44, compared to a ratio of 0.49 at Mount Lorette. The highest single-day count was 21 on October 10. The total is the fourth highest at the site and is 19.8% above average.

American Kestrel A record count of 8 birds was made between September 22 and October 11, with 5 birds occurring on September 22. The count is 392% above average and comprised 4 females, 3 male and 1 indeterminate bird.

Merlin Single unaged and unsexed birds of the race *columbarius* were seen on September 24 and October 1 equaling last year's record. The species had only been recorded once before 2016.

Gyrfalcon Never recorded on the count.

Peregrine Falcon Two birds, 1 adult and 1 juvenile also equaled last year's record count the only previous record being a single bird seen in 2011. The juvenile bird was seen on September 22 and the adult on October 25.

Prairie Falcon Not recorded this year. The first ever record of the species at the site occurred on October 14 last year.

Observers

Vance Mattson (41 days), assisted by Virginia Rasch (2 days: October 14 and 22), Gaby Zezulka (1 day: October 14).

Appendix (separate attachment)

List of Tables

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Table 6 Mount Lorette, Golden Eagle passage by hour, fall 2017.

Table 7 Median passage dates and age ratios, Mount Lorette fall 2017.

Table 8 Vicki Ridge daily counts September 22 to November 15, fall 2017.

Table 9 Vicki Ridge summary weather, fall 2017.

Table 10 Vicki Ridge summary fall counts 2014-2017.

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Table 15A Comparison of fall 2017 median passage dates and age ratios, Mount Lorette and Vicki Ridge.

Table 15B Percentage of raptor groups at the 3 sites, fall 2017