

MOUNT LORETTE, VICKI RIDGE AND STEEPLES FALL 2018

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Summary and highlights

This was the 27th consecutive year that some form of fall count has been conducted by RMERF observers at Mount Lorette, it was the 5th consecutive count and 2nd complete count at Vicki Ridge, and the 10th consecutive extended reconnaissance count at the Steeples site in BC. Because of a mixture of La Niña and weak El Niño oceanic conditions the weather produced regular heavy snowfalls up to around October 10, but subsequently snow events became more sporadic, the temperature remained cool but not particularly cold and winds were more moderate than usual producing generally good observing conditions at all three sites.

At Mount Lorette the combined species total of 3170 was 21% below the long-term average for valid counts and the Golden Eagle count of 2698 was 21.3% below the long-term average. Fifteen raptor species were recorded, but only 3 relatively scarce species occurred in above average numbers. The high single-day Golden Eagle count of 337 on October 5 is 15.6% below average. The Golden Eagle immature:adult ratio of 0.42 indicates another successful breeding season but represents a significant fall from last year's record high ratio and the probable beginning of cyclical declining boreal Snowshoe Hare populations. Four species moved later than normal and 4 moved earlier, and the combined-species median passage date of October 15 was 2 days later than average.

The second complete Vicki Ridge count in SW Alberta produced a record 4755 migrants of 17 species in 50 days, including a record count of Golden Eagle (2735 that included a single day count of 611 on October 15) and a record count of 445 Bald Eagles: numbers of most other

species, however, were significantly lower than last year. The Golden Eagle immature:adult ratio was 0.39 and the median passage date was October 15, the same as at Mount Lorette.

Despite a record number of days (50) and hours (212.5) in the field the Steeples site on the western flanks of the Rocky Mountains near Cranbrook, BC produced only the third highest count there of 486 birds of 15 species. It did produce a record count of 75 Red-tailed Hawks, however and counts of 4 Cooper's Hawks and 3 Broad-winged Hawks that are both relatively scarce species in the Rocky Mountain Trench. The Golden Eagle count of 177 was the third highest for the site and yielded an immature:adult ratio of 0.43, almost identical to that at Mount Lorette.

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 2018 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 20 years 1993-1996, 1998-2001, 2003-2005 and 2009-17.

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 second full count of 50 days (434.9 hours) was conducted on Vicki Ridge near Beaver Mines, Alberta between September 20 and November 15 (**Table 8**). Vicki Ridge is located 17 km SSE of the Piitaistakis-South Livingstone site and monitors many 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 a record 50 days (212.5 hours) between September 20 and November 15 (**Table 11**). The days and hours are 63% and 83.5% above average respectively.

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 percentage occurrences 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. La Niña oceanic conditions appeared to persist for the first 3 weeks of the count bringing cool temperatures and several periods of rain, snow and fog, but subsequently a weak El Niño appeared to prevail that produced slightly higher temperatures, less precipitation and more frequent and stronger W-SW winds. Four days, (September 27: snow rain and fog, October 2: heavy snow, and October 8 and 9: snow with all mountains obscured.) were lost because of the weather. This is 33.3% above the average for 2011-2017. A further 6

days (+75%), were significantly shortened because of the weather. A total of 19 active days saw precipitation (10 snow, 9 rain) which is 46.5% above the average of the previous seven years. The overall average daily maximum temperature was 5.4 °C which is 37.2% lower than the average of the last seven years. The average high temperature in September was 3.8 °C (76.1% below average), in October it was a cool 3.4°C (-61.6%) and in November it was a cold -2 °C (-40.2%). The highest maximum temperature was 19 °C on October 18, the lowest minimum temperature was -14 °C on Nov 7 and 8, and on 6 active days the temperature failed to rise above freezing, which is 21.3% above the average of the last 7 years. Five days (9.4%, 26.8% above average) were either completely cloudless or had a maximum cloud cover of up to 20%, and 10 days (18.9%, 70.3% above average) experienced a cloud cover that was between 80 and 100%. Most other days saw wide diurnal variation in percentage cloud cover with 35 days (66%, 27.6% 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 7 active days (13.2%, 11.3% below average) and the western ridges were 40-100% occluded on 14 days (26.4%, 4.7% 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 was 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 66% (7.6% below average), WNW-NW 5.7% (44.8% below average), NW-NE 24.5% (377.7% above average), and variable on one day (3.8%, 4% below average). Apart from September, wind directions favourable to migration generally prevailed. Observers assessed these winds as calm to light (0-10 km/h) 11.3% of the time (30.5% below average), as light to moderate (1-40 km/h) 32.1% of the time (65.6% above average), as moderate (11-40 km/h) 24.5% (71.5% above average), as moderate to strong (11-100 km/h) 15.1% (44% below average), and as strong to very strong (40-100+ km/h) 15.1% (20.3% below average).

In summary, a mixture of La Niña and mild El Niño climatic conditions produced below-average temperatures throughout and especially in September, when there were 4 completely lost days and 3 of the season's 6 shortened days occurred. Subsequently, observing and migration conditions were generally good with predominant SW-W winds little precipitation, favourable sky conditions, relatively clear ridges and, as last year, significantly fewer strong to very strong winds and significantly more moderate winds.

General flight dynamics *September 20 to November 15*

The combined species total of 3170 is 21.0% below the long-term average for valid counts and is the lowest count since 2013 (**Table 4**). The September count of 381 (**Table 5A**) was 23.9% below average; the October count of 2552 (**Table 5B**) was 18.9% below average, and the November count of 237 (**Table 5C**) was 26.8% below average. Migrant raptors were recorded on 48 of the 53 active days between September 20 and November 15 which is the second lowest ever and 9.6% below average (**Table 2**). A total of 11 days (20.8%) between September 23 and

October 21 had a passage of at least 100 migrants, and the highest single-day count was 349 on October 5 which was 17.9% below the average fall high count. Peak movement periods were 798 birds on 4 days between October 4 and 7, and 1210 birds on 8 days between October 14 and 21: these 12 days comprised 63.3% of the total flight and included 1637 Golden Eagles. The combined species median passage date of October 15 is 2 days later than the average for the count period September 20-November 15. Of the 8 species that occurred in sufficient numbers to calculate median passage dates (**Table 7**), 4 were earlier than average: Bald Eagle and Cooper's Hawk (2 days early), Rough-legged Hawk (3 days early) and Northern Harrier (5 days early); while 4 were later than average: Northern Goshawk (1 day late), Sharp-shinned Hawk (2 days late), Golden Eagle (3 days late) and Red-tailed Hawk (7 days late).

Of the 15 species recorded (**Table 4**), only 3 occurred in above average numbers all of which only ever occur in low numbers at the site: Osprey 3 (+11.1%), Swainson's Hawk 1 (+185.7%), and Prairie Falcon 3 (+36.4%). The other 12 species occurred in below average numbers: Bald Eagle 217 (-8.3%), Northern Harrier 7 (-32%), Sharp-shinned Hawk 69 (-48.8%), Cooper's Hawk 7 (-68.8%), Northern Goshawk 37 (-15.2%), Broad-winged Hawk 1 (-83.3%), Red-tailed Hawk 27 (-18.9%), Rough-legged Hawk 36 (-28.8%), Golden Eagle 2698 (-21.3%), Merlin 4 (-47.7%), Gyrfalcon 2 (-29.8%) and Peregrine Falcon 2 (-66.7%). Turkey Vulture, Ferruginous Hawk and American Kestrel were not recorded having occurred previously on 1, 8 and 19 previous fall counts within the current period respectively.

The final count was Turkey Vulture 0, Osprey 3, Bald Eagle 217, Northern Harrier 7, Sharp-shinned Hawk 69, Cooper's Hawk 7, Northern Goshawk 37, *Accipiter* sp. 8, Broad-winged Hawk 1, Swainson's Hawk 1, Red-tailed Hawk 27, Ferruginous Hawk 0, Rough-legged Hawk 36, *Buteo* sp. 5, Golden Eagle 2698, eagle sp. 35, American Kestrel 0, Merlin 4, Gyrfalcon 2, Peregrine Falcon 2, Prairie Falcon 3, *Falco* sp. 4, and indeterminate raptor 4, for a total of 3170 migrant raptors of 15 species.

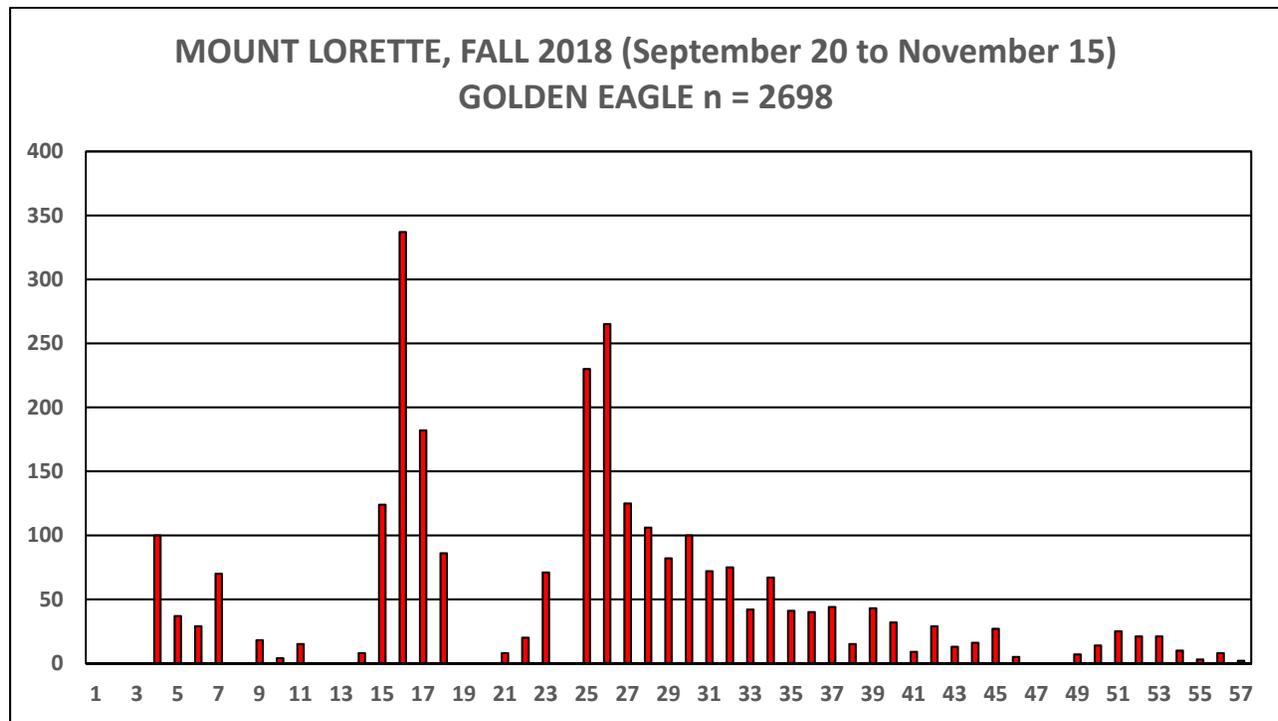
Golden Eagle

Observers counted a total of 2698 migrating Golden Eagles on 46 days between September 23 and November 15 (**Table 2** and **Figure 1**). The count is 21.3% below the long-term average of counts that are considered valid, and the number of days on which they occurred is 9.6% below average. The highest single-day count was 337 on October 5, which is 15.6% below the average maximum count. There were 9 days between September 23 and October 19 which saw movement of at least 100 birds. Peak movements were 729 birds between October 4 and 7, and 990 birds between October 14 and 21. Because of poor weather conditions movement up to October 3 was sporadic but subsequent movement was reasonably evenly paced with a steady decrease in numbers after October 19 that was only occasionally interrupted by poor weather (**Figure 1**). The monthly counts (**Table 5**) show that 273 birds moved in September, which is 24.9% below average; 2253 moved in October (-19.6%), and 172 birds were counted in November (-24.5%).

Golden Eagles comprised 85.1% of the total count this season which, as in the last two years, results in part from below-average counts of most of the other more common raptor species. The flight comprised 1590 adults, 183 subadults, 481 juveniles, 1 undifferentiated immature bird and 443 birds of unknown age yielding an immature:adult ratio of 0.42 that is 40% above average and is the third highest ever recorded at the site, the highest ratio recorded being 0.49 last year. The ratio of juvenile birds to subadults and adults was 0.27 which is 59.8% above average: both ratios indicate a very productive breeding season.

The highest cumulative hourly counts were 471 (1500-1600), 411 (1400-1500), 409 (1600-1700) and 379 (1300-1400) MST. No birds were recorded between 0600 and 0700 and 28 birds occurred after 1800. (**Figure 2** and **Table 6**). Only one hour, 1300-1400 on October 5, saw a passage rate of over 1 bird/minute (62) and the second busiest hour was 54 on October 15 (1400-1500). The almost perfect negatively skewed distribution curve peaking at 1500-1600 (MST) (**Figure 2**) is essentially identical to the cumulative hourly distribution curve recorded at the site over 12 years between 1992 and 2005 (**Figure 3**).

The species median passage date of October 15 was 3 days later than the average date; adult birds were 1 day later than average on October 15, while immature birds were 2 days earlier than average on October 7.



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

Figure 1

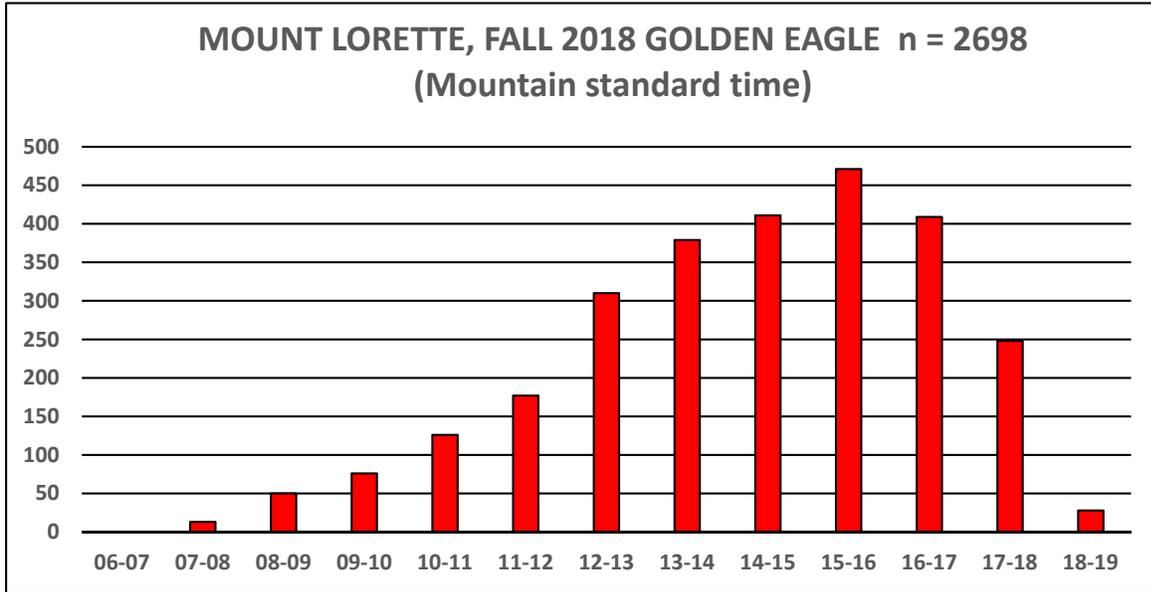


Figure 2

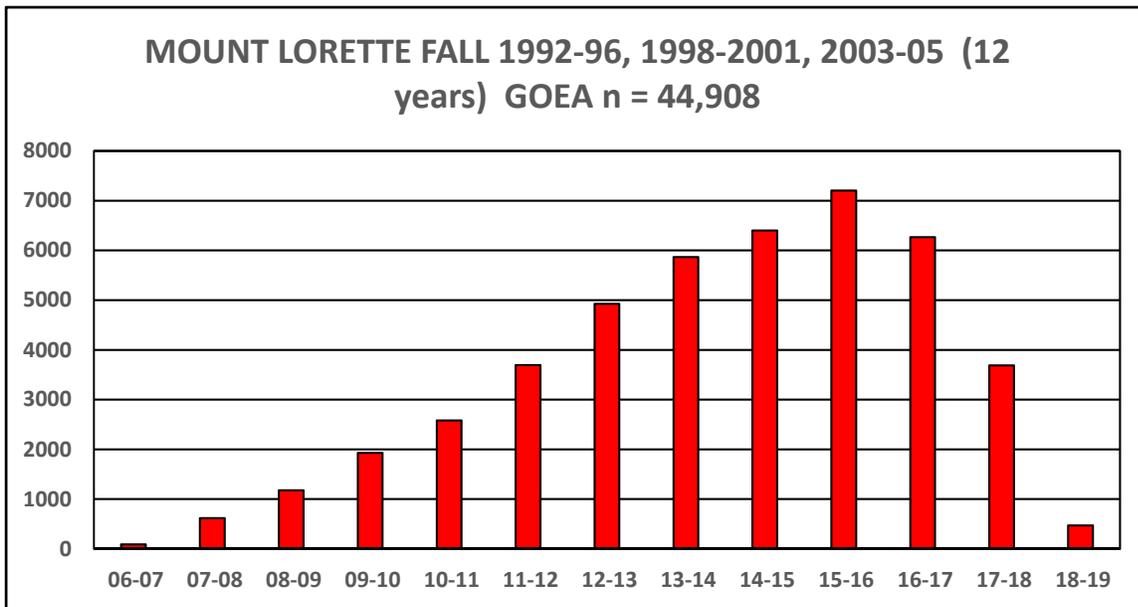


Figure 3

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. After a three-year increasing trend to 2015, a slight decrease in 2016 and a slight increase last year, this season's count was the third lowest ever at the site despite the high age ratio and continues the overall declining trend for the species at the site seen since 1993. A similar trend is also seen in spring counts at the site after 1995. 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.

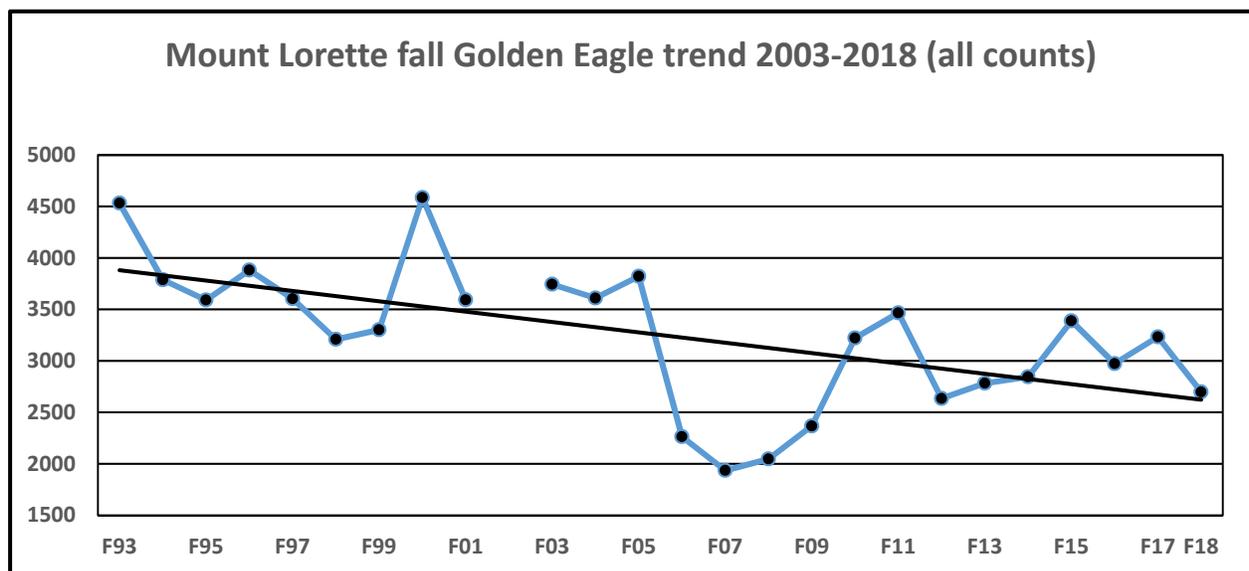


Figure 4

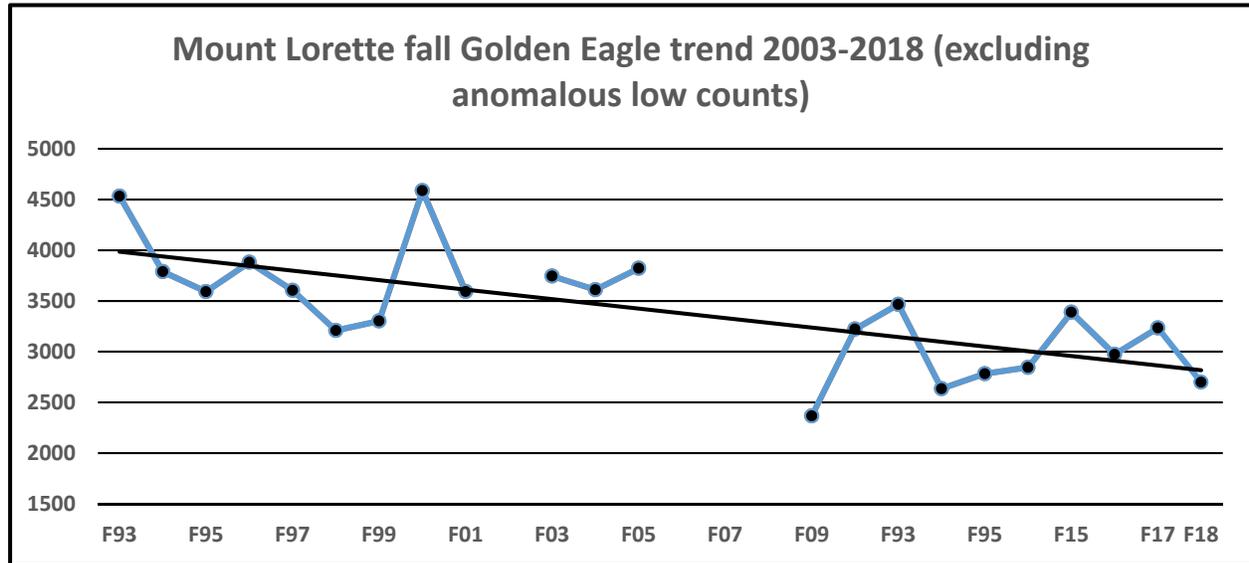


Figure 5

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 and, after a slight decline in 2015, the 2017 ratio probably represented the height of the current rising trend. It is interesting to note that the 2017 ratio of 0.49 was only slightly lower than the culmination of the previous cycle in 2007 that was observed on the Piitaistakis-South Livingstone count. The 2018 ratio, although still high, probably marks the beginning of the next diminishing trend. 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 probably marked 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.

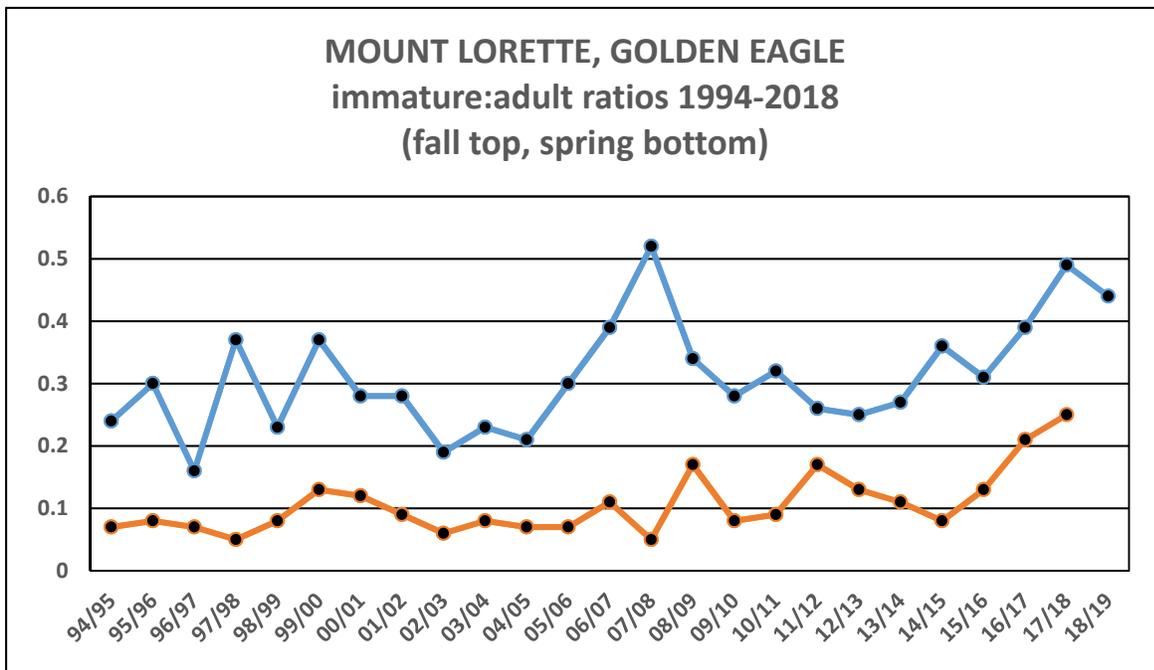


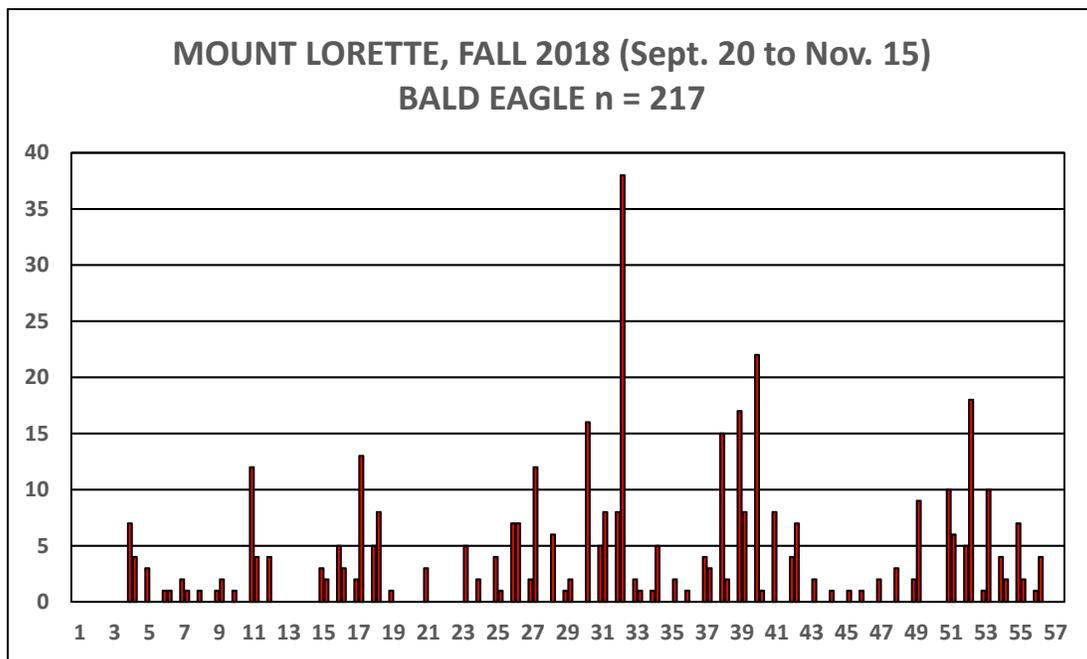
Figure 6

Bald Eagle

The count of 217 birds seen on 36 days between September 23 and November 14 was 8.3% below average (**Figure 7**) and was the highest valid count since 2015. All 10 counts since 2009, however, have 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 highest single-day count was 38 on October 28 which is the third highest ever at the site after 52 in 1993 and 43 in 1994, and is 66.7% above the average high count.

The monthly counts (**Table 5**) were 12 in September (-35.7%), 150 in October (+5.4%) which is the highest October count since 2005, and 55 in November (-26.5%) with 28 of these birds moving on November 10 and 11. The most sustained movement was eighty-two birds (37.8% of the total count) that moved on 7 days between October 15 and 21. The flight comprised 128 adults, 42 subadults, 34 juveniles, 6 undifferentiated immature birds and 7 birds of indeterminate age giving an immature:adult ratio of 0.64. The number of juvenile birds suggests a fairly successful breeding season. The median passage dates for the species and for adults was October 21, which were 2 and 4 days earlier than average respectively, and for immature birds it was October 20 which was coincident with the average median passage date.



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

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 birds were counted on September 23 and 1 on September 26. The count is 8.3% below average.

Northern Harrier A total of 7 birds were seen on 3 days between September 24 and October 22. The count is 32% below average. The highest daily count was 4 on September 28 which is the highest ever daily count and 77.8% above average. The median passage date for the species was September 28 which was 5 days earlier than the long-term average date. The flight comprised 2 adult females, 2 undifferentiated female/juveniles 2 juveniles and 1 indeterminate bird.

Sharp-shinned Hawk A total of 69 birds were counted on 20 days between September 23 and November 5. The count is 48.8% below average and the number of days on which they occurred is 20.9% below average. The highest single-day count was 11 on September 30, which is 55.8% below the average maximum count. The species median passage date was October 4 which was 2 days later than average. Adult birds were 1 day later than average on October 4 and juveniles were 1 day late on September 30. The flight comprised 15 adults, 9 juveniles and 45 birds of unknown age that gives an immature:adult ratio of 0.6 which is 53.1% above average although, as usual, the high percentage of unaged birds means that this figure should be treated with caution. The monthly counts were 33 in September (-41.6%), 33 in October (-55%), and 3 in November (+39%).

Cooper's Hawk A total of only 7 birds moved on 6 days between September 24 and October 22, with a maximum passage of 2 birds on September 28. The count was 68.8% below average and was the lowest ever at the site behind 10 in 2009 and 2012. The September count of 4 birds was 64.4% below average, the October count of 3 birds was 71.1% below average and no birds were seen in November. The flight comprised 1 adult, 1 juvenile and 5 birds of unknown age. The median passage date for the species was September 28, 2 days earlier than average.

Northern Goshawk A total of 37 goshawks migrated on 16 days between September 25 and November 14, a total which is 15.2% below average for the site. The highest single-day count was 9 on September 30 which is 60.7% below the average high count. The September count was 14 (+80.6%), the October count was 20 (-31%) and the November count of 3 was 52% below average. The flight comprised 13 adults, 4 juveniles and 20 birds of unknown age giving a juvenile:adult ratio of 0.31, 57.3% above average. The median passage date for the species was October 12, 1 day later than average, adults were 3 days later than average on October 14 and juveniles were 9 days later than average on October 19.

Broad-winged Hawk Just 1 adult light morph Broad-winged Hawk was seen on September 29, a count that is 83.3% below average.

Swainson's Hawk A single adult light morph bird was seen on October 4. It has occurred on six previous counts within the present count period.

Red-tailed Hawk The count of 27 birds on 12 days between September 23 and October 21 was 18.9% below average. The highest daily count was 5 on October 15, which is 29.1% below average. The September count of 11 was 38.7% below average, the October count of 16 was 13.9% above average and no birds were seen in November. The median passage date for the species and for adult birds were both 7 days later than average on October 6. The flight comprised 16 birds of the race *B.j.calurus*, 7 of which were light morphs (4 adults, 2 juveniles and 1 indeterminate bird), 2 were rufous (intermediate) morphs (1 adult, 1 juvenile) and 7 were dark morph birds (4 adults, 1 juvenile and 2 indeterminate); 5 “Harlan’s Hawks” (*B.j.harlani*), 4 dark morphs (1 adult, 2 juveniles and 1 indeterminate) and 1 adult light morph, and 6 indeterminate birds (3 light, 1 dark, and 2 of indeterminate morph). The overall immature:adult ratio was 0.55 which is 22% above average.

Ferruginous Hawk Not recorded this season. Single birds have been recorded on seven previous counts.

Rough-legged Hawk A total of 36 birds moved on 14 days between September 28 and November 11, which is 28.8% below average for the site. The single-day high count was 5 on October 11 which is 48.2% below the average high count. The September count of 7 was the second highest ever for the month behind 10 in 1993 and was 278.4% above average, the October count of 28 was 32.1% below average and the November count of 1 was 83.6% below average. The median passage date for the species was 3 days earlier than average on October 14. The dark:light morph ratio was 0.08, which is the same as recorded at Vicki Ridge last year.

American Kestrel This is only the second year that the species has not been recorded. Fifty-one birds have been recorded on 19 previous counts.

Merlin The total of 4 Merlins was counted on 4 days between September 26 and the late date of November 11 and was 47.7% below average. One bird moved in September (-64.9%), 2 in October (-55.3%) and 1 in November (+137.5%). The flight comprised 2 birds ascribed to the race *F.c.columbarius* (1 adult female and 1 of indeterminate sex or age), 1 indeterminate bird of the race *F.c.richardsonii*, and 1 bird of indeterminate race, age or sex.

Gyrfalcon Grey morph birds were seen October 6 and October 20, a total that is 47.7% below average.

Peregrine Falcon Single adult birds were seen on October 7 and 27, a total that is 66.7% below average.

Prairie Falcon Two birds were seen on September 26 and 1 on September 29, a total that is 36.4% below average

Table 7 summarises the Lorette age-ratio and median passage data.

Observers at Mount Lorette

Principal Observers Caroline Lambert (15.5 days), Blake Weis (11 days), Cliff Hansen and Rick Robb (8 days), George Halmazna (8 days), Bill Wilson (8 days), Joel Duncan (3.5 days), Cliff Hansen (1 day), Dan Parliament (1 day).

Assistants Lori Anderson (8 days), Joel Duncan (8 days), Patrick Farley (6 days), Dan Parliament (6 days), Rosemary Power (4 days), Gord Petersen (3 days), Brian McBride (3 days), Rachel McKay (3 days), Ruth Morrow (3 days), Heinz Unger (3 days), Cliff Hansen (2 days), Katherine Peterson (2 days), James and Theresa Bannon (1 day), Caroline Lambert (1 day), Cindy Parliament (1 day), Blake Weis (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 many 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 Kylo Ridge cannot be seen. The western edge of Kylo 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. Fall 2018 was the second complete count conducted at the site between September 20 and November 15 and comprised 50 days (-3.8% cf. 2017) and 434.9 hours (+3.8%). During the 2018 fall season, Vicki Ridgetop was occupied on 8 days, Waterton 61 wellsite for 45 days, Waterton 68 wellsite/western Kylo Ridge for 9 days, Township Road 6-5 north of the ridge for 2 days and the Seven-Gates road east of the ridge for 2 day. On occasions 2 or 3 sites would be occupied on a given day (**Table 8**).

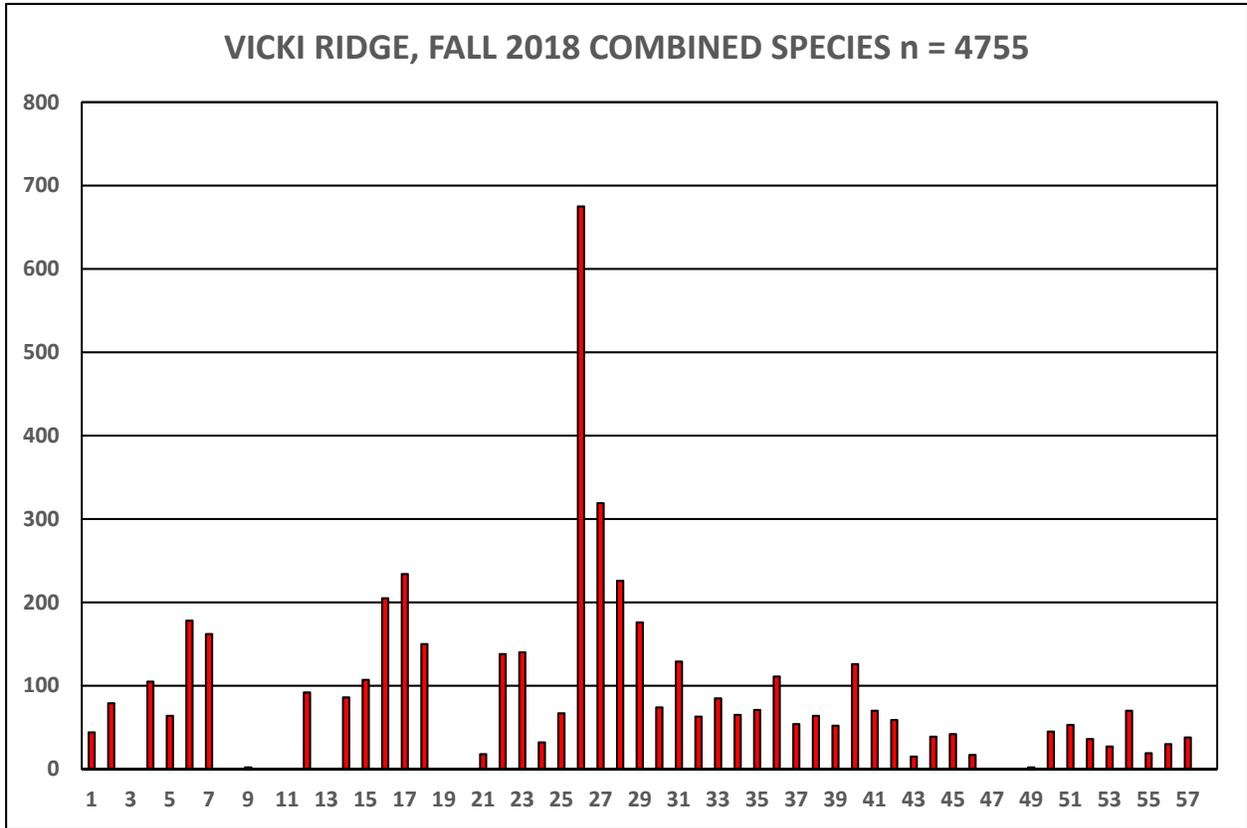
Weather and count summary

Table 9 summarizes the weather at the site. A total of 7 days were completely lost to poor weather conditions which resulted in the ridge being completely obscured. The snowfall on October 2 was so heavy that the ridge could not be accessed over the following two days during which time observation took place from the Lynx Creek Road 4 km north of the site. Twenty-one active days (42%) saw precipitation in the form of rain, snow, sleet, hail or fog and led to reduced observation hours on October 10 and 13, and November 2, 5, 6 and 7. September high temperatures averaged 11.4 °C (range 15 to 3), October averaged 14.8 °C (range 22 to 3) and November averaged 2 °C (range 8.5 to -8). The most common wind direction was WSW-W on 29 days (58%) followed by W-NW on 7 days (14%), with the remainder (28%) variable or NE-SE especially up to October 13. and winds gusted to at least 40 km/h on 31 days (62%). After October 9 conditions were generally favourable for migration and movement was fairly consistent with the exception of November 5-7 when east winds and ice fog stopped the flow. The highest single-day count of 675 that included 611 Golden Eagles was a record for the site (**Figure 8**). The daily observation locations are noted on **Table 9**.

The final count was a record 4755 migrant raptors of 17 species at an average rate of 10.93 raptors/hour which is a new high for the count and 7.2% higher than the 2017 count (**Tables 8 and 10**). The highest single-day count of 675 raptors, which included 611 Golden Eagles on October 10 was a record for the site. All but two active viewing days (November 5 and 6) produced migrant raptors with an average daily count throughout the season of 95.1 birds. September produced 534 migrants at a rate of 9.9 raptors/hour (12.2% and 7.2% above 2017 respectively), October produced 3688 migrants at a rate of 14.52 raptors/hour (18% and 12.5% above 2017 respectively), and November produced 433 migrants at a rate of 3.7 raptors/hour (9.3% and -19.6% compared to 2017 respectively). The combined-species median passage date was, as last year, October 15, and the same as at Mount Lorette.

The final count of 4755 migrants of 17 species included record counts for both eagle species, but of the remaining 15 species 10 occurred in lower numbers compared to 2017. The count was (with variance from the 2017 count in parentheses) 0 Turkey Vultures (=), 8 Ospreys (-27.3%), 445 Bald Eagles (+27.1%), 15 Northern Harriers (-21.1%), 627 Sharp-shinned Hawks (-16.5%), 74 Cooper's Hawks (-21.3%), 103 Northern Goshawks (-5.5%), 7 unidentified *Accipiters* (+16.7%), 24 Broad-winged Hawks (-27.3%), 2 Swainson's Hawks (+100%), 176 Red-tailed

Hawks (-24.8%), 8 Ferruginous Hawks (+33.3%), 436 Rough-legged Hawks (-15.3%), 25 unidentified *Buteos* (+31.6%), 2735 Golden Eagles (+36.7%), 7 unidentified eagles (-61.1%), 12 American Kestrels (-42.9%), 21 Merlins (+5%), 5 Gyrfalcons (=), 9 Peregrine Falcons (-47.1%), 10 Prairie Falcons (+100%), 2 unidentified falcons (=) and 4 unidentified raptors.



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

Figure 8

Species Accounts (numbers in parenthesis are the difference between the 2017 and the 2018 counts)

Turkey Vulture The species was not recorded this year.

Osprey A total of 8 birds (-27.3%) were counted on 5 days between September 21 and October 4, with 3 occurring on September 24. The median passage date was September 24, 4 days earlier than last year.

Bald Eagle A new site count high total of 445 birds (+27.1%) moved on 42 days between September 20 and November 15. Seventeen birds moved in September (+54.5%), 297 in October (+59.7%) and 131 in November (=14.4%), with a single-day high count of 32 on October 29. Twenty-three days saw the passage of ten or more birds. The flight comprised 260 adults, 78 subadults, 77 juveniles, 3 undifferentiated immature birds and 24 indeterminate birds giving an immature:adult ratio of 0.62 (compared to 0.41 at Mount Lorette) and 8.8% higher than last year's ratio. The median passage date for the species and for immature birds was October 30, and was October 29 for adult birds. These dates are 3 days earlier, 4 days earlier and 1 day earlier than last year's count respectively.

Northern Harrier The count was 15 birds (-21.1%) that occurred on 9 days between September 20 and October 29, with a single-day high count of 3 on September 20, 21 and 26. The flight comprised 7 adults (5 males, 2 females), 7 juvenile birds (6 males and 1 female), and 1 unaged female bird, giving an overall age ratio of 1, which is the same as last year. The species median passage date was September 25, six days earlier than last year; adults were September 26 (11 days earlier) and juveniles were September 24 (5 days earlier).

Sharp-shinned Hawk A total of 627 birds (-16.5%) occurred on 32 days between September 20 and October 30, with a single-day high count of 74 on September 25. A total of 254 birds were counted in September (-28.3%), 362 in October (-5.2%) and only 1 in November (=). The count comprised 132 adults, 14 juveniles and 481 indeterminate birds, giving an immature:adult ratio of 0.11 (-31.25%) 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 3 (4 and 2 days late respectively), and for immature birds it was September 21 (3 days early).

Cooper's Hawk A total of 74 birds (-21.3%) occurred on 21 days between September 20 and October 30, with a single-day high count of 10 on October 4. A total of 34 birds were counted in September (-29.2%) and 40 in October (-13%). The flight comprised 28 adults, 7 juveniles and 39 indeterminate birds, which gives an immature:adult ratio of 0.25 (+56.3%). The species median passage date was October 1 (2 days late), adults were September 26 and immature birds were September 20 (5 and 4 days early respectively).

Northern Goshawk A total of 103 birds (-5.5%) occurred on 38 days between September 20 and November 15, with a single-day high count of 13 on October 22. A total of 13 birds were counted in September (-60.6%), 80 in October (+23.1%) and 10 in November (-9.1%). The flight comprised 81 adults, 11 juveniles and 11 indeterminate birds, which gives an immature:adult ratio of 0.14 (-81.6%). The species median passage date was October 21 (9 days late), adults were October 22 (10 days late) and immature birds were October 17 (18 days late).

Broad-winged Hawk A total of 24 birds (-27.3%) occurred on 12 days between September 20 and October 17, with a single-day high count of 6 on September 25. A total of 13 birds were counted in September (-7.1%) and 11 in October (-42.1%). The flight comprised 15 light morph

birds (12 adults, 4 juveniles and 3 indeterminate) and 5 dark morphs (3 adults, 1 juvenile and 1 indeterminate), giving an immature:adult ratio of 0.33 (-56.6%). The species median passage date was September 26 (7 days early), adults were September 25 (8 days early) and immature birds were also September 25 (4 days early).

Swainson's Hawk Two adult light morph birds (+100%) occurred on September 20.

Red-tailed Hawk A total of 176 birds (-24.8%) occurred on 31 days between September 20 and November 12, with a single-day high count of 21 on October 3. A total of 51 birds were counted in September (-27.1%) and 122 in October (+25.6%). The flight comprised 129 birds of the race *B.j.calurus*, 96 of which were light morphs (82 adults, 6 juveniles and 8 indeterminate birds), 2 were adult rufous (intermediate) morphs, and 31 were dark morphs (30 adults and 5 indeterminate bird); 1 light adult was an "Eastern Red-tailed Hawk" (*B.j.borealis*) and 40 birds were of the race *B.j.harlani*, 35 of which were dark morphs (26 adults, 7 juveniles and 2 indeterminate) and 5 were light morph birds (4 adults and 1 juvenile); 6 dark birds were of indeterminate race or age. The overall immature:adult ratio was 0.1 (-41.9%). The species and adult median passage dates were October 5 (both 1 day late), and that for immature birds was October 7 (6 days late); the median passage date for *calurus* was October 5 and for *harlani* was October 7.

Ferruginous Hawk A count high total of 8 birds (+33.3%) occurred on 6 days between September 20 and October 17, with a single-day high count of 3 on October 7. Two birds occurred in September (-50%) and 6 in October (+200%). The flight comprised 4 light morph birds (2 adults, 2 juveniles) and 4 adult dark morph adults, giving an immature:adult ratio of 0.33 (+65%). The species median passage date was October 7 (8 days late) and adults were October 6 (7 days late).

Rough-legged Hawk A total of 436 birds (-15.3%) were observed on 39 days between September 23 and November 15, and the highest single-day count was 59 on October 16. A total of 10 birds were counted in September (+900%), 392 in October (-19.3%) and 34 in November (+21.4%). The flight consisted of 355 light morphs, 43 dark morphs and 38 undetermined morphs giving a light:dark ratio of 0.12. The species median passage date was October 19 (5 days late).

Golden Eagle A count high total of 2735 birds (+36.7%) occurred on 46 days between September 20 and November 15, with a site record single-day high count of 611 on October 15. There were 5 other there three-figure counts: 126 on October 5, 175 on October 6, 218 on October 16, 141 on October 17 and 124 on October 18. The four-day period October 15-18 saw the passage of 1004 Golden Eagles. The September count was 181 (+61.6%), October yielded 2309 birds (+36.3%) and 245 moved in November (+25.6%). The flight comprised 1816 adults, 218 subadults, 485 juveniles and 216 indeterminate birds, which gives an immature:adult ratio of 0.39 (-33.9%) and a juvenile: adult/subadult ratio of 0.24 (-25%). These compare to ratios of 0.42 and 0.27 respectively at Mount Lorette. The median passage date for the species and for adult birds was October 15 (both the same as last year), and the immature median passage date was also October 15 (8 days later than last year). Subadult birds were 1 day earlier than last year on October 13, but juveniles were 8 days later on October 15.

American Kestrel A total of 12 birds (-42.9%) occurred on 7 days between September 23 and October 17, with a single-day high count of 4 on September 25. The flight comprised 2 males, 6 females and 4 birds of undetermined sex giving a female:male ratio of 2 (+127.8%). The median passage date for the species was September 25 (3 days early).

Merlin A total of 21 birds (+5%) were counted on 14 days between September 20 and November 11 with a single-day high count of 4 birds on September 24. The flight comprised 17 birds of the race *F.c.columbarius* (10 indeterminate males, 2 adult females, 5 indeterminate females and 3 birds of unknown age or sex) and 1 indeterminate bird of the race *F.c.richardsonii*. The median passage date for the species was, as last year, September 28.

Gyrfalcon A total of 5 birds (the same as last year) occurred on 4 days between October 14 and November 11, with 2 birds moving on October 16. All birds were grey morphs (3 adult males and 2 indeterminate birds). The species median passage date was October 16 (13 days early).

Peregrine Falcon A total of 9 birds (-47.1%) occurred on 8 days between September 20 and October 18, with a single-day high count of 2 on September 20. The flight comprised 5 males (4 adults, 1 juvenile), 2 adult females and 2 birds of indeterminate sex or age, giving an immature:adult ratio of 0.4 (-33.3%). The median passage date for the species was September 24 (16 days early) and adults were 6 days early on September 23.

Prairie Falcon A count high total of 10 birds (+100%) occurred on 9 days between September 23 and November 16. The species median passage date was October 25 (3 days later than last year).

Also recorded were 7 undifferentiated *Accipiters* (+16.7%), 25 undifferentiated *Buteos* (4 light, 15 dark and 6 of undetermined morph) (+31.6%), 7 undifferentiated eagles (-61.1%), 2 undifferentiated Falcons (=) and 4 small unidentified raptors.

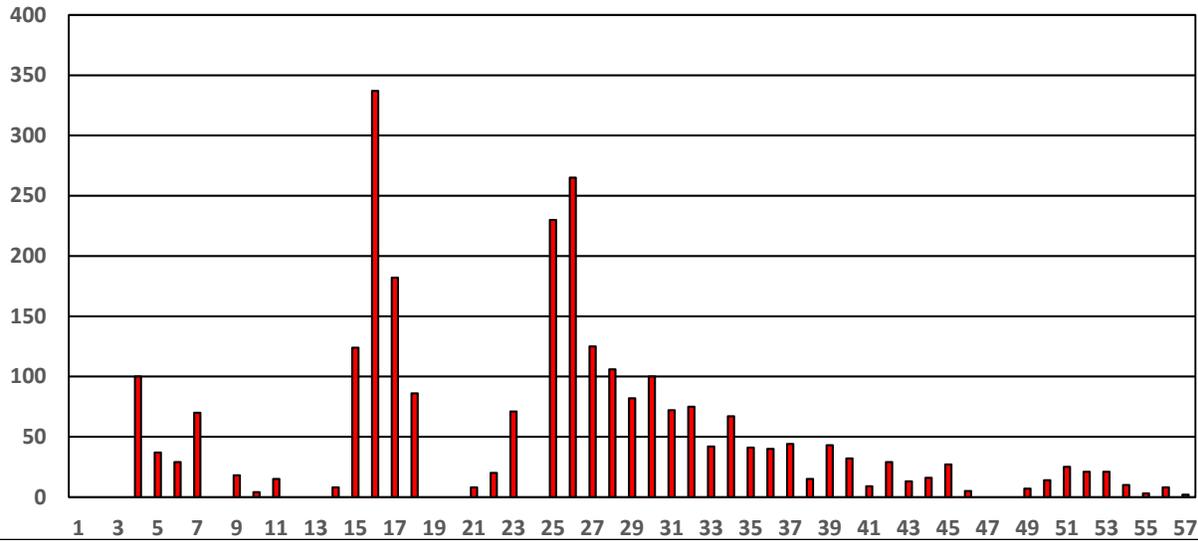
Comparison of Eagle Species at Vicki Ridge and Mount Lorette

For the first time the Golden Eagle counts at Vicki Ridge (2735) and at Mount Lorette (2698) were very similar (**Figures 9A, 9B**). At both sites Golden Eagles moved in four coincident pulses each terminated by 2 to 3 days of bad weather that stopped all raptor movement. **Figure 9C** is a summary of the dynamics of the four pulses at the two sites. The first pulse comprised the entire September counts at both sites and involved 273 birds at Mount Lorette and 181 birds at Vicki Ridge. Because of poor weather conditions the movement did not start at Mount Lorette until September 23 when a remarkable 100 birds were counted. This spike probably reached Vicki Ridge on September 25 when 63 birds occurred. The second pulse occurred during the first week of October when Mount Lorette had a passage of 737 Golden Eagles in 5 days and Vicki Ridge had 465 in 7 days, but the peak count of 337 on October 5 at Mount Lorette, which turned out to be the highest of the season, was not replicated at Vicki Ridge. The third and longest pulse which was largely uninterrupted by poor weather started on October 10 at Lorette and October 11 at Vicki Ridge and both terminated on November 4. The sites counted 1577 and 1896 birds

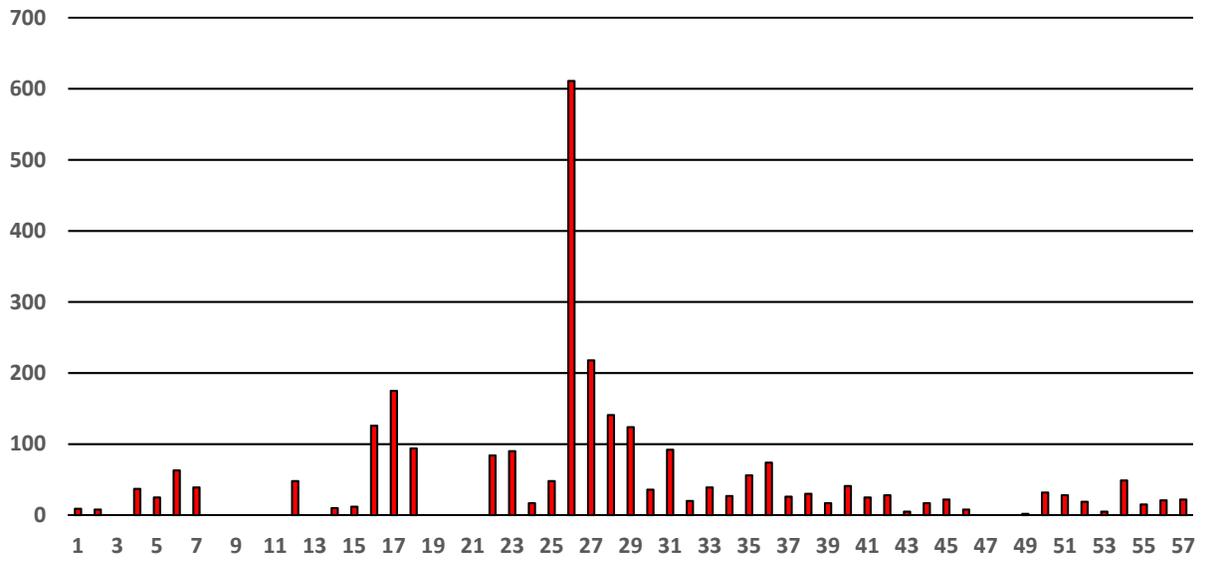
respectively with the highest counts occurring up to October 15 and then gradually diminishing as the pulse proceeded. The high count at Vicki Ridge was a site record 611 birds on October 15, a spike that was not seen at Mount Lorette, and the difference between the high counts in this pulse (346) accounts for much of the total numerical difference (319 birds) in pulse 3 at the two sites. Pulse 4 was coincident at the two sites (November 7-15) with 111 birds seen at Lorette and 193 at Vicki Ridge, with high counts of 25 and 49 respectively. The age distributions at the two sites are very similar with Vicky ridge comprising 1816 adults, 216 subadults, 485 juveniles and 216 unaged birds, while Mount Lorette recorded 1590 adults, 183 subadults, 481 juveniles and 443 unaged birds. The biggest difference is in the number of adult birds which is probably attributable to the higher number of unaged Golden Eagles and undifferentiated eagles at Mount Lorette, both of which tend to be adult Golden Eagles. The age ratios at the two sites are comparable and each shows a similar diminution from last year's highly successful breeding season: at Vicki Ridge the immature: adult ratio was 0.39 and the juvenile: adult/subadult ratio was 0.24 (-25%) compared to ratios of 0.42 and 0.27 respectively at Mount Lorette. At Vicki Ridge the median passage date for the species, for adult birds and for immature birds were all October 15. At Mount Lorette the species and adult median passage dates were also October 15 but immature birds were 2 days earlier than average on October 7.

As in 2017 over twice as many Bald Eagles were counted at Vicki Ridge (445) than at Mount Lorette (217). **Figure 10** shows a persistent migration of low numbers of Bald Eagles at both sites to October 12. The subsequent movement at Mount Lorette was concentrated in two pulses: 89 birds on 7 days between October 15 and 21, which included the highest single day count at either site of 38 birds on October 21, and 43 on 5 days between November 7 and 11. These two pulses comprised 61% of the total count. By contrast at Vicki Ridge there was steady movement between October 11 and November 3 of 303 birds in 25 days including the highest single-day count at the site of 32 on October 29, and a second pulse on 8 days between November 9 and 15, with the two pulses producing nearly 91% of the total count. Reflecting the overall species count numbers, each of the Bald Eagle age classes are about twice as numerous at Vicky Ridge compared to Mount Lorette (adults 445 (217), subadults 81 (42), juveniles 77 (34) and undifferentiated immatures 3 (6)), which produced an immature:adult age ratio of 0.62 at Vicky Ridge and 0.64 at Mount Lorette. At Vicki Ridge the median passage date for the species and for immature birds was October 30, and was October 29 for adult birds. At Mount Lorette the median passage dates for the species and for adults was October 21 and for immature birds it was October 20, which reflects the concentrated movement there between October 15 and 21.

MOUNT LORETTE, FALL 2018 (September 20 to November 15)
GOLDEN EAGLE n = 2698 (Figure 9A)



VICKI RIDGE, FALL 2018 (September 20 to November 15)
GOLDEN EAGLE n = 2735 (Figure 9A)



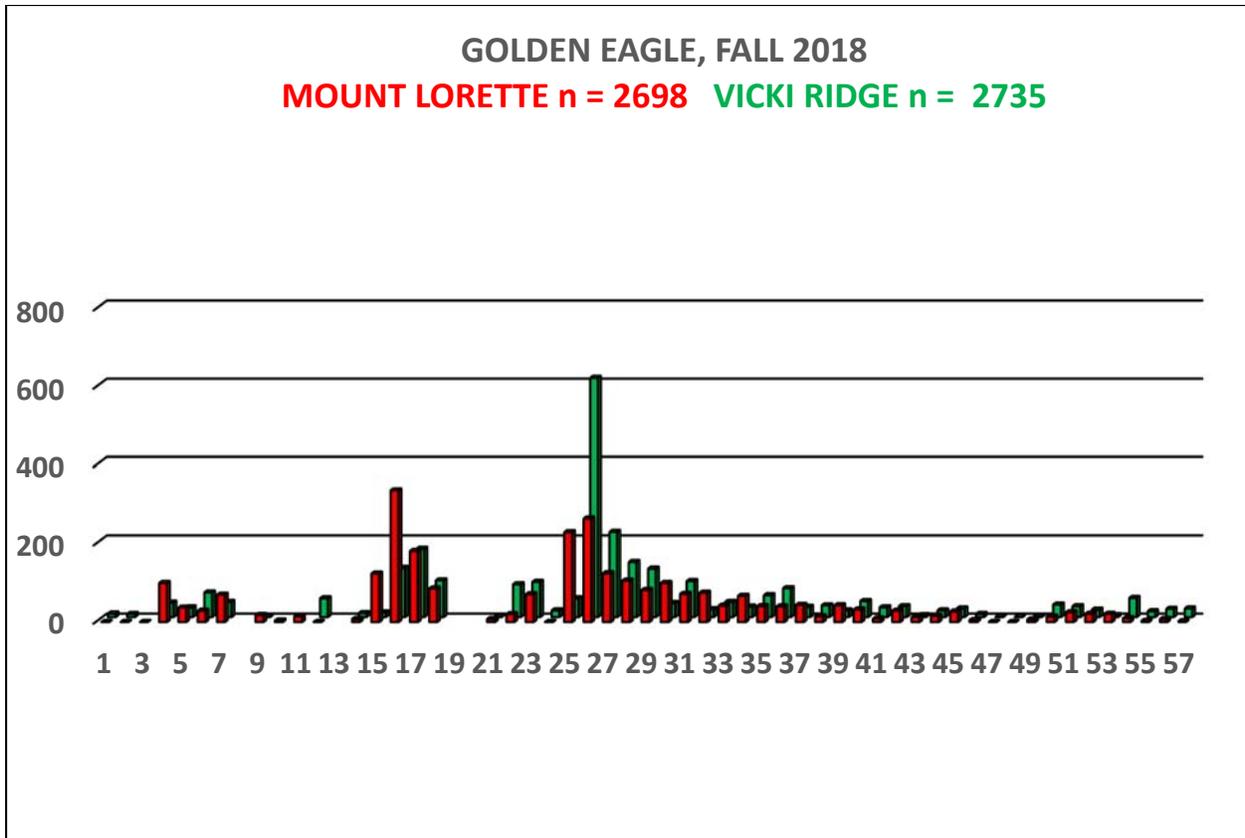
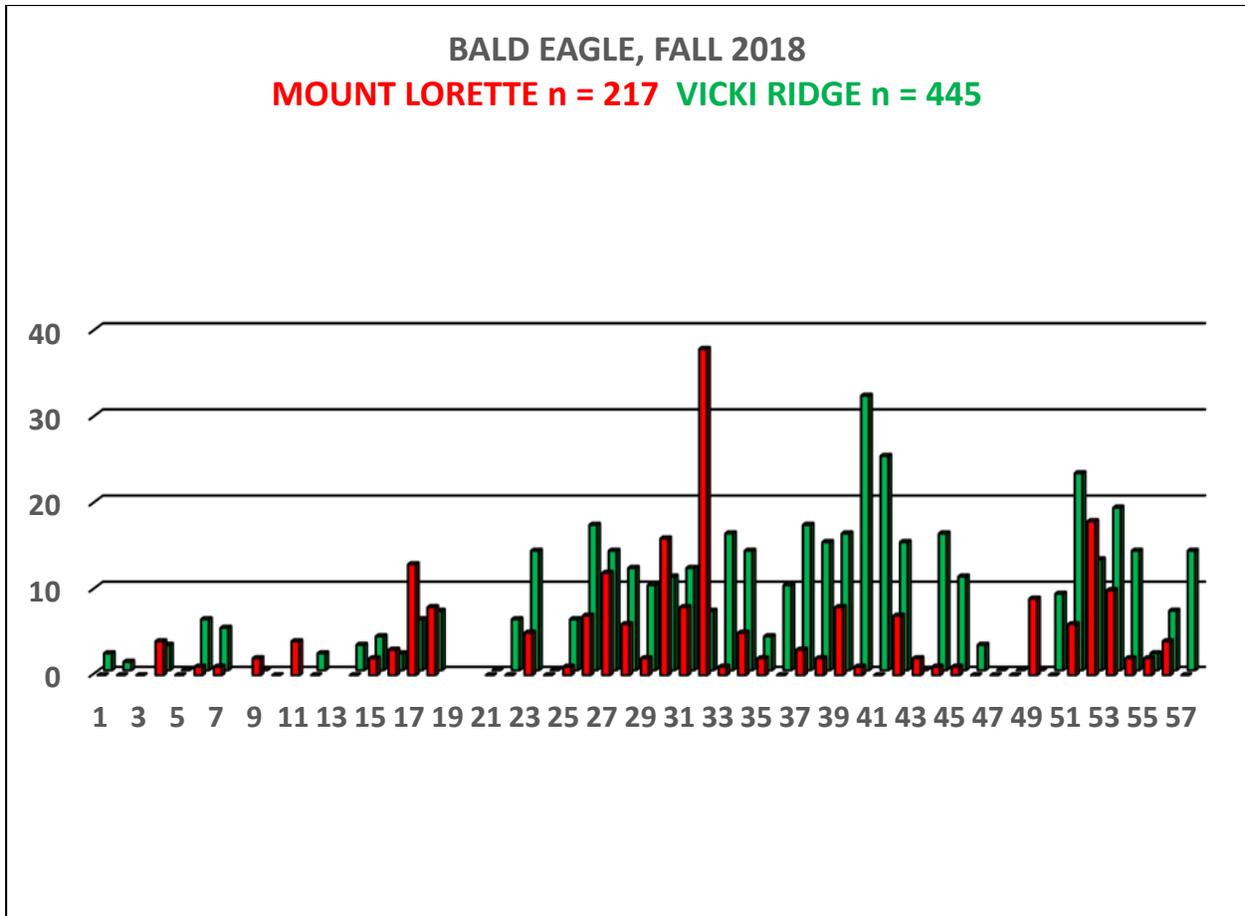


Figure 9B

	SITE	DATES	DAYS	GOEA	HIGHEST	DATE
PULSE 1	Lorette	September 23-30	8	273	100	23-Sep
	Vicki Ridge	September 20-26	7	181	63	25-Sep
PULSE 2	Lorette	October 03-07	5	737	337	05-Oct
	Vicki Ridge	October 01-07	7	465	175	06-Oct
PULSE 3	Lorette	October 10-November 04	26	1577	265	15-Oct
	Vicki Ridge	October 11-November 04	25	1896	611	15-Oct
PULSE 4	Lorette	November 7-15	9	111	25	09-Nov
	Vicki Ridge	November 7-15	9	193	49	12-Nov

Figure 9C



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

Figure 10

Observers

Principal Observers: Peter Sherrington (48.5 days), Doug and Teresa Dolmen (1 day), Gord Petersen (0.5 days),

Assisted by Hilary Atkinson (30 days), Gord Petersen (16 days), Raymond Toal (8 Days), Trevor Lewis (6 days), Denise Cocciolone-Amatto (5 days), Doug and Teresa Dolmen (3 days), Pat Lucas (2 days), Shirley Enzol (1 day), Dan and Charlene Lee (1 day), Troy Malish (1 day)

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 2018 season is the ninth reconnaissance count conducted at the site (**Table 13**), and comprised 50 days and 215.5 hours of observation which are 63% and 83.5% above average respectably and represent the most intensive fall count to date. Vance Mattson was the principle observer each day. Virginia Rasch, of the Rocky Mountains Naturalists, acted as a spotter on 2 days (October 7 and November 3), Joe Rothermund and Dianne Cooper on 1 day (October 7), and Caryn Kilback on 1 day (November 7). Only 7 days were lost, 6 to inclement weather and 1 to explore the Purcell Mountains (October 21). Observation usually occurred between approximately 1300 and 1800, except for Mondays and Wednesdays when observation could not commence until 1530 (due to work commitments). These late starts likely affected both the overall and eagle totals. Observation was conducted at 4 sites, though the bulk (44.5 days) (89%) occurred at the Mount Bill Nye, with 1 day each at the South Lakit and Diorite Creek sites, and 3.5 at the Wasa site (formerly the "Kootenay River" site). All but the Wasa site are located immediately along the westerly ridges of the Rocky Mountains, with 34 km spanning the distance between the most northerly (Diorite Creek) and southerly (South Lakit) sites. The Wasa site is in the centre of the Rocky Mountain Trench and has again proven a viable flyway when the ridges, which are 7 km to the west, are entirely shrouded yet the central valley remains clear. This occurred on October 4 and 5 when 81 migrants, including 31 eagles, moved south over Wasa Lake.

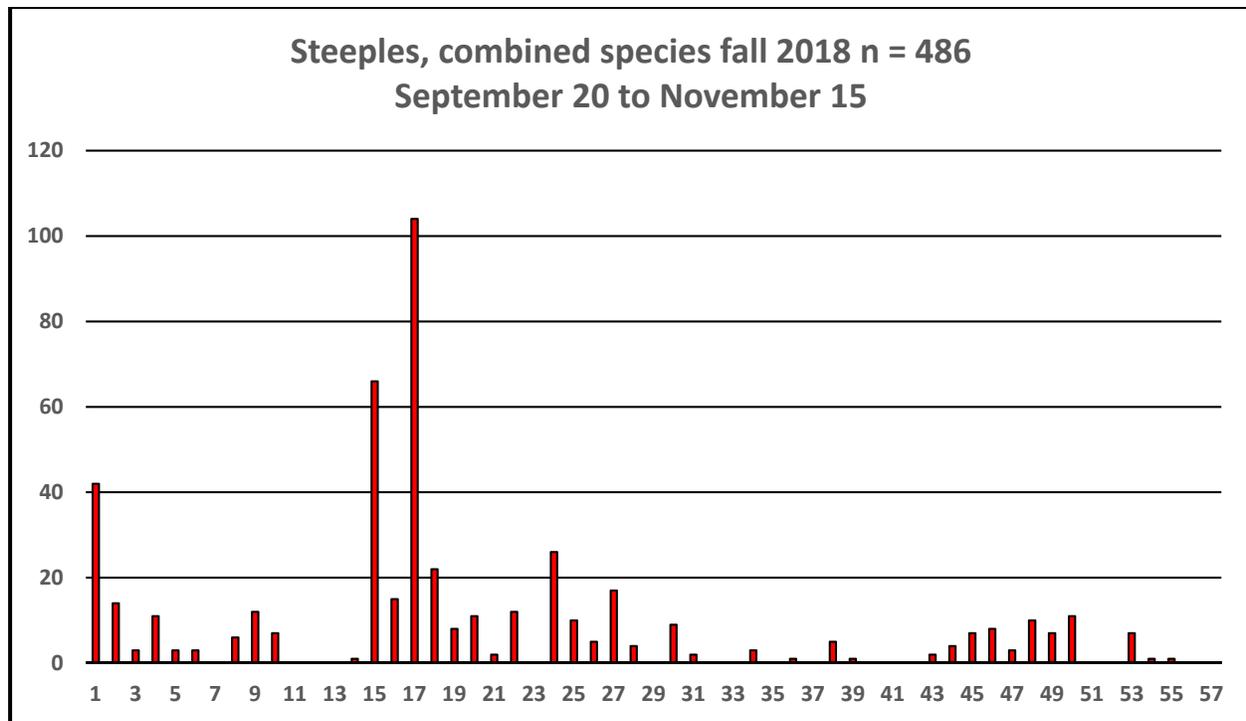
Weather and count summary

Table 12 summarizes the weather at the site. A total of 6 days were lost because of inclement weather (September 30, October 1, 2, 26, November 9, 14). Rain fell on 8 active days, showers on a further 4 days and 1 day saw wet snow flurries. The average high temperature for September was 14.1 °C (range 9 to 17 °C), for October it was 10.2 °C (range 6 to 13 °C) and November was cooler with an average of 4.9 °C (range 1 to 12 °C). Conditions were assessed as calm 48% of the time, S-SW winds 24%, W-N winds 14%, variable 10% and other 4%. Wind velocity were assessed as calm to light 60% of the time, light to moderate 14%, moderate 12%, moderate to strong 4%, strong 6% and variable 4%. The mountain ridges on active days were assessed as clear 66% of the time, partly clear 20% and obscured 14% of the time. Table 12 also indicates the observation sites occupied during the count.

The total of 486 migrant raptors is 32.9% above average and is the third highest fall count for the site since 2009, behind the 629 migrants in 2016 and the 625 in 2017. The highest daily total occurred on October 6 with 104 migrants, including 89 eagles (75 Golden Eagles). The 4-day period from October 4 to October 7 saw the highest concentration of raptor movement, with 207 total migrants (42.6% of the entire count), and 127 eagles (43% of the total eagle count). This period roughly coincides with the bulk of raptor movement in previous years (e.g. from 2014 to 2016), although in 2017 the highest concentration occurred later, between October 21 and November 6.

Twenty-one percent (101) of total raptor movement occurred in September (from September 20-30), 67% (324) in October, and 12.5% (61) from November 1-15. For eagles, 10% (30) moved in September, 70% (207) in October, and 20% (58) in November, with each eagle species displaying fairly similar monthly distributions: For Golden Eagles 8% (14) moved in September, 73% (130) in October, and 33 (19%) November; for Bald Eagles, 14% (16) were recorded in September, 65% (75) in October, and 22% (25) in November.

The final count of 486 raptors of 15 species was 1 Turkey Vulture (+80%), 2 Ospreys (-21.7%), 116 Bald Eagles (-26.4%), 14 Northern Harriers (+215%), 72 Sharp-shinned Hawks (+95.2%), a record equaling 4 Cooper's Hawks (+300%), 8 Northern Goshawks (+71.4%), 3 Broad-winged Hawks (+440%), a record 75 Red-tailed Hawks (+255%), 3 Rough-legged Hawks (-55.7%), 177 Golden Eagles (+42.1%), 2 unidentified eagles (+100%), 3 American Kestrels (+28.6%), 3 Merlins (+440%), 1 Gyrfalcon, which is a first record for the site, 1 Peregrine Falcon (+80%) and 1 unidentified raptor (**Tables 11 and 13, and figure 11**).



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

Figure 11

Turkey Vulture The only record was a single unaged bird on September 21.

Osprey Two Ospreys were seen on October 4. The total is 21.7% below average.

Bald Eagle The total of 116 birds counted on 25 days between September 20 and November 11 is 21.7% below average. The highest single-day counts were 14 on October 6 and 13. The flight comprised 67 adults, 7 subadults, 42 juveniles giving an immature:adult ratio of 0.73 compared to 0.64 at Mount Lorette and 0.62 at Vicki Ridge.

Northern Harrier The total of 14 birds counted on 10 days between September 20 and October 23 was the second highest count for the site and 215% above average. The highest single-day count was 2 on September 27, October 4, 6 and 13. The flight comprised 7 adult females, 4 unsexed juveniles and 3 indeterminate birds.

Sharp-shinned Hawk The total of 72 birds seen on 17 days between September 20 and October 16 was the third highest ever count for the site and 95.2% above average. The highest single-day counts were 11 on September 4 and 7. The flight comprised 21 adults, 2 juveniles and 49 indeterminate birds.

Cooper's Hawk The 4 birds (1 adult, 2 juveniles and 1 indeterminate) seen on 3 days between September 20 and October 4 equals the previous highest count at the site in 2009. Single birds occurred on September 20 and 21 and 2 on October 4.

Northern Goshawk The count was 8 birds that moved on 7 days between October 6 and November 6, with a single-day high count of 2 on October 9. The total is 74.1% above average. The flight comprised 4 adults and 3 juveniles and 1 indeterminate bird.

Broad-winged Hawk Three single birds were counted between September 20 (2 birds) and September 28 (1 bird). Season is only the second time that the species has occurred, the first being 5 birds recorded last year. The flight comprised 2 light morphs (1 adult and 1 juvenile) and 1 adult dark morph bird.

Swainson's Hawk Never recorded on the count.

Red-tailed Hawk A record total of 75 birds (255% above average) occurred on 14 days between September 20 and October 15, with single-day high counts of 23 on September 20 and 28 on October 4 that between them comprised 68% of the total count. The flight comprised 68 birds of the race *B.j.calurus* (58 light morphs: 44 adults, 8 juveniles, 8 unaged; 6 dark morphs: 4 adults, 1 juvenile and 1 unaged, and 2 rufous (intermediate) morphs (1 adult, 1 juvenile); 4 birds of the race *B.j.harlani* (3 dark morphs: 1a, 2j and 1 adult intermediate morph) and 3 birds of unknown race, morph or age.

Ferruginous Hawk Never recorded on the count.

Rough-legged Hawk A count of only 3 birds on 3 days between October 4 and 8 was 55.7% below average. The total comprised 1 light and 2 dark morph birds.

Golden Eagle The total of 177 birds counted on 32 days between September 20 and November 13 was the third highest count ever and is 42.1% above average. The highest single-day count was 75 on October 4, which represented 42.4% of the total; the only other day with a double-figure count was October 16 when 15 birds were seen. The flight comprised 120 adults, 5 subadults, 47 juveniles and 5 indeterminate birds giving an immature:adult ratio of 0.43, compared to a ratio of 0.42 at Mount Lorette and 0.39 at Vicky Ridge.

American Kestrel The count was 3 adult female birds seen on September 20 and October 3 and 4. The count is 28.6% above average.

Merlin A site-record 3 Merlins were seen singly on October 4 and 13, and on the late date of November 12. The total is 440% above average. All birds were unaged and unsexed birds of the race *columbarius*.

Gyr Falcon The first record for the count was a grey morph bird on October 13.

Peregrine Falcon A single juvenile bird on September 2 was the only record this season. The total was 80% above average, however, as the bird was only the sixth record for the count.

Prairie Falcon Not recorded this year. The only record of the species at the site occurred on October 14 in 2016.

Observers

Vance Mattson (40 days), assisted by Virginia Rasch (2 days: October 7 and November 3), Dianne Cooper and Joe Rothermund (October 7), Pam Power and Knit Finstad (October 8) and Caryn Kilback (November 7).

Appendix (separate attachment)

List of Tables

Table 1A RMERF Front Ranges fall counts: principal sites, 1992-2018: 1B Mount Lorette fall counts 1992-2018.

Table 2 Mount Lorette daily counts September 20 to November 15, fall 2018.

Table 3 Mount Lorette summary weather, fall 2018.

Table 4 Mount Lorette summary counts 1993-2018 (excluding short counts).

Table 5 Mount Lorette monthly summary counts 1993-2018 (excluding short counts): 5A September, 5B October, and 5C November.

Table 6 Mount Lorette, Golden Eagle passage by hour, fall 2018.

Table 7 Median passage dates and age ratios, Mount Lorette fall 2018.

Table 8 Vicki Ridge daily counts September 22 to November 15, fall 2018.

Table 9 Vicki Ridge summary weather, fall 2018.

Table 10 Vicki Ridge summary fall counts 2014-2018.

Table 11 Steeples daily counts September 20 to November 15, fall 2018.

Table 12 Steeples summary weather, fall 2018.

Table 13 Steeples summary fall counts 2009-2018.

Table 14 Summary of the fall 2017 Mount Lorette, Vicki Ridge and Steeples counts.

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