MOUNT LORETTE, VICKI RIDGE AND STEEPLES FALL 2019

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Summary and highlights

This was the 28th consecutive year that some form of fall count has been conducted by RMERF observers at Mount Lorette, it was the 6th consecutive count and 3rd complete count at Vicki Ridge, and the 11th consecutive extended reconnaissance count at the Steeples site in BC. Temperatures at all three sites were cooler than average that produced above average snowfall but little rain. Winds at Mount Lorette and Vicki Ridge were predominantly favourable SW-W and there were significantly fewer strong to very strong wind days. Overall migration and viewing conditions were generally good at all three sites.

At Mount Lorette the combined species total, counted over 53 days, of 2735 was 31.1% below the long-term average for valid counts and was the second lowest valid count ever. The Golden Eagle count of 2398 was 29.3% below the long-term average and was also the second lowest valid count ever. Thirteen raptor species were recorded, but apart from 1 locally rare species all occurred in below average numbers. The high single-day Golden Eagle count of 337 on October 4 was 14.9% below average, and only five other days had three-figure Golden Eagle counts. The Golden Eagle immature:adult ratio of 0.36 indicates a fairly successful breeding season and represents the second straight year of decline from the 2018 record high ratio. Both eagle species moved 4 days earlier than average that contributed to a combined-species median passage date that was 3 days earlier than average on October 10.

The third complete Vicki Ridge count in SW Alberta produced a record 4641 migrants of 18 species in 54 days, which included a record count of 2778 Golden Eagles that for the first time

was higher than the count at Mount Lorette, although the median passage date for the species was 6 days later that at Mount Lorette on October 15. The Golden Eagle immature:adult ratio was 0.36, identical to that at Mount Lorette.

At the Steeples site on the western flanks of the Rocky Mountains near Cranbrook, BC the count of 34 days was the lowest since 2013, but the total of 448 was 18.6% above average and the Golden Eagle count of 191 was the third highest ever and 47.2% above average. The Bald Eagle count of 155 was close to average. The Golden Eagle immature:adult ratio was 0.41, slightly higher than at Mount Lorette and Beaver Mines.

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 permits 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 2019 at the principal observation sites 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 Eagles[1]. 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 Crowsnest 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 21 years 1993-1996, 1998-2001, 2003-2005 and 2009-18.

At Mount Lorette this season observers spent a total of 53 days (532.4hours) of a possible 57 days at the site between September 20 and November 15 **(Table 2),** the days and hours being 2.5% and 5.0% below average respectively. A third full count of 54 days (482.1 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 days and hours are 5.9% and 12.9% above average of the last two years respectively. The Steeples site on the western flanks of the Rocky Mountains near Cranbrook, BC, was occupied for a 34 days (143.5 hours) between September 20 and November 15 (**Table 11**). The days and hours are 4.3% and 14.3% 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.

Throughout the report the term juvenile refers to birds that were fledged in the current year, in this case 2019; subadults are birds that are not juvenile but have not yet achieved their final adult plumage and the term immature refers to any age-identified bird that is not an adult, i.e. undifferentiated juvenile and subadult birds.

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. Four days, September 28 and 29, October 8, and November 5, were lost to persistent heavy snow that completely obscured the mountains. This is 28% above the average for 2011-2019 and a further 4 days (+6.7%), were significantly shortened because of the weather. A total of 12 active days saw precipitation (8 snow, 4 rain) which is 14.2% below the average of the previous eight years: snow days were 39% above average, but rain days were 50.7% below average. The overall average daily maximum temperature was 4.5 ºC which is 3.7 ºC lower than the average of the last eight years. The average high temperature in September was 11.9 ºC (17.4% below average), in October it was a cool 4.3ºC (-47.3%) and in November it was a cold 0.5 ºC (-84.3%). The highest maximum temperature was 20 ºC on September 21, the lowest minimum temperature was -23 ºC on October 29, and on 9 active days the temperature failed to rise above freezing, which is 74.6% above the average of the last 8 years.

Wind data were taken from the Environment Canada Nakiska Ridgetop weather station situated 4 km west of the Hay Meadow site on Olympic Summit (Mount Allan) at 2543 m. Ridge winds were from the SSW-W 83% of the time (17.3 % above average), WNW-NW 1.9% (80.5% below average), NW-NE 5.7% (24.5% below average), NE-S 3.8% (68% above average) and variable on two days (5.7%, 44.8% above average). Wind directions favourable to migration generally prevailed throughout the count. These winds were calm to light (0-10 km/h) 1.9% of the time (62.1% below average), as light to moderate (1-40 km/h) 34% of the time (62.1% above average), as moderate (11-40 km/h) 18.7% (20.2% above average), as moderate to strong (11-100 km/h) 34% (33.5% above average), and as strong to very strong (40-100+ km/h) 11.3% (38.8% below average).

Five days (9.4%, 22.7% above average) were either completely cloudless or had a maximum cloud cover of up to 20%, and 11 days (20.8%, 72.3% above average) experienced a cloud cover that was between 80 and 100%. Most other days saw wide diurnal variation in percentage cloud cover with 30 days (56.6%, 5.8% above average) 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 9 active days (17%, 15.8% above average) and the western ridges were also 40-100% occluded on 9 days (17%, 38.3% below average).

In summary, although weak El Niño oceanic conditions prevailed in the Pacific Ocean to the west of the site throughout the count, of more significance was the anomalously high water-temperatures in the Gulf of Alaska that modified the continental wind patterns and brought cooler temperatures that produced above average snowfall but significantly below average rainfall. Generally, however, observing and migration conditions were good with above average predominant SW-W winds, favourable sky conditions, relatively clear ridges and, as in the last two years, significantly fewer strong to very strong winds and significantly more moderate winds that tend to favour migration.

General flight dynamics *September 20 to November 15*

The combined species total of 2731 is 31.2% below the long-term average for valid counts and is the lowest valid count ever **(Table 4)**. The September count of 279 (**Table 5A**) was 43.6% below average and the 4th lowest valid count ever; the October count of 2352 **(Table 5B)** was 23.6% below average and was also the 4th lowest valid count ever, and the November count of 104 **(Table 5C)** was 65.8% below average and was the second lowest valid count ever. Migrant raptors were recorded on 50 of the 54 active days between September 20 and November 15 which is 5.4% below average (**Table 2**). A total of only 7 days (13.2%) between October 4 and 18 had a passage of at least 100 migrants, and the highest single-day count was 365 on October 4 which was 13.4% below the average fall high count. The peak movement was 706 birds on 4 days between October 4 and 7 that comprised 25.8% of the total, and the count of 2119 migrants on 20 active days between September 30 and October 20 accounted for 77.5% of the total flight. The combined species median passage date of October 10 is 3 days earlier than the average for the count period September 20-November 15. Of the 9 species that occurred in sufficient numbers to calculate median passage dates (**Table 7**), 4 were earlier than average: Merlin (5 days early), Bald Eagle and Golden Eagle (4 days early) and Northern Harrier (2 days early); Rough-legged Hawks equaled the average date, while 4 were later than average: Northern Goshawk (5 days late), Cooper's Hawk (4 days late). Sharp-shinned Hawk (3 days late) and Red-tailed Hawk (1 day late).

Of the 13 species recorded **(Table 4)**, only Ferruginous Hawk occurred in the above average number of 1 (+162.5%) as it was only the ninth season a single bird had been recorded at the site. The other 12 species occurred in below average numbers: Osprey 1 (-63.2%), Bald Eagle 148 (-37.2%), Northern Harrier 7 (-31%), Sharp-shinned Hawk 56 (-57.5%), Cooper's Hawk 8 (-63.2%), Northern Goshawk 41 (-5.4%), Red-tailed Hawk 11 (-66.7% and the lowest fall count ever), Rough-legged Hawk 14 (-71.9% and the lowest fall count ever), Golden Eagle 2395 (-29.4% and the second-lowest fall count ever), Merlin 5 (-33.1%), Peregrine Falcon 1 (-82.8%) and Prairie Falcon 2 (-10.6%). Turkey Vulture, Broad-winged Hawk, Swainson's Hawk, American Kestrel and Gyrfalcon were not recorded having occurred previously on 1, 19, 7, 19 and 17 previous fall counts within the current period respectively.

The final count was Turkey Vulture 0, Osprey 1, Bald Eagle 148, Northern Harrier 7, Sharp-shinned Hawk 56, Cooper's Hawk 8, Northern Goshawk 41, *Accipiter* sp. 8, Broad-winged Hawk 0, Swainson's Hawk 0, Red-tailed Hawk 11, Ferruginous Hawk 1, Rough-legged Hawk 14, *Buteo* sp. 4, Golden Eagle 2395, eagle sp. 24, American Kestrel 0, Merlin 5, Gyrfalcon 0, Peregrine Falcon 1, Prairie Falcon 2, *Falco* sp. 3, and indeterminate raptor 2, for a total of 2731 migrant raptors of 13 species.

Golden Eagle

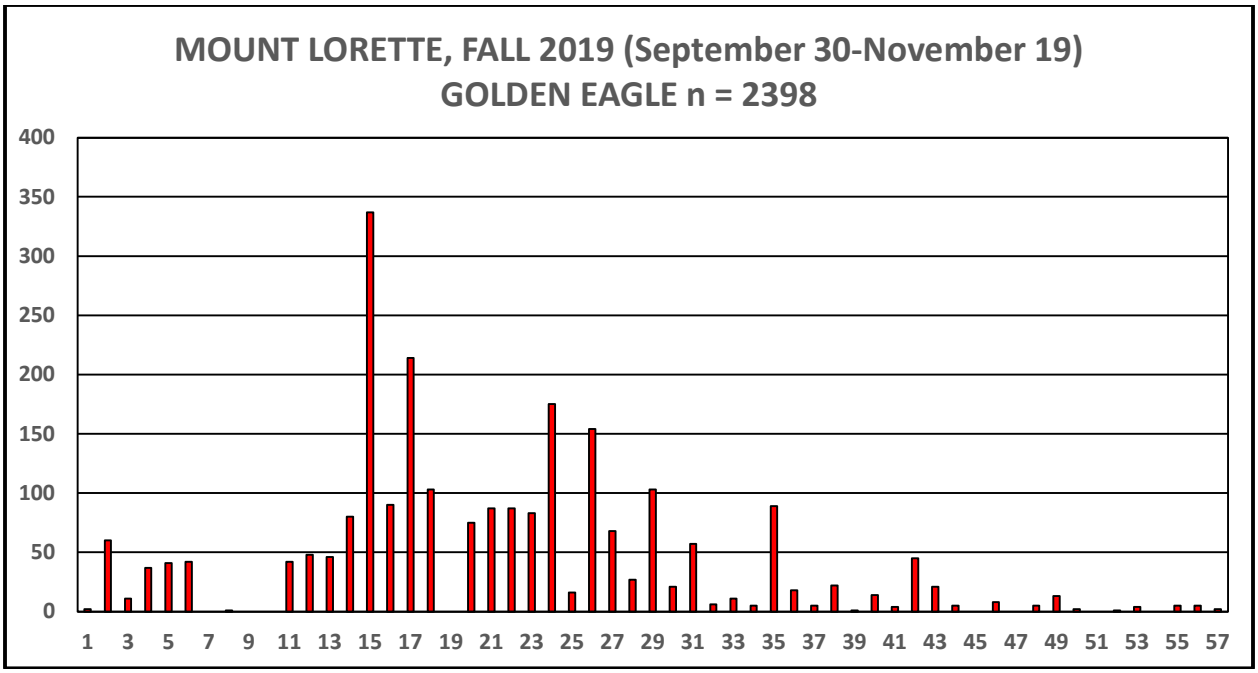
Observers counted a total of 2395 migrating Golden Eagles on 49 days between September 20 and November 15 **(Table 2** and **Figure 1).** The count is 29.4% below the long-term average of counts that are considered valid, and the number of days on which they occurred is 3.3% below

average. The highest single-day count was 337 on October 4, which is 14.9% below the average maximum count. It is interesting to note that last year's maximum count was also 337, on October 5. There were only 6 days between October 5 and October 18 which saw movement of at least 100 birds. The September count of 236 was 34.3% below average, the October count of 2091 was 24% below average and the November count of 71 was 66.9% below average and was the 4th lowest November count ever. The migration dynamic for the species is discussed more fully in the section "Comparison of Eagle Species at Vicki Ridge and Mount Lorette" that forms part of the Vicki Ridge report.

Golden Eagles comprised 87.7% of the total count this season which, as in the last three years, results in part from below-average counts of most of the other more common raptor species. The flight comprised 1366 adults, 158 subadults, 314 juveniles, 17 undifferentiated immature birds and 543 birds of unknown age yielding an immature:adult ratio of 0.36 that is 17.8% above average. The ratio of juvenile birds to subadults and adults was 0.21 which is 20.3% above average: both ratios indicate a productive breeding season but well below the peak of two years ago.

The highest cumulative hourly counts were 346 (1400-1500), 335 (1600-1700), 299 (1500-1600) and 296 (1300-1400) MST. Two birds were recorded between 0600 and 0700 and 48 birds occurred after 1800. (**Figure 2** and **Table 6**). The highest hourly passage was 55 between 1600 and 1700 on October 4, with the second busiest hour of 51 during the previous hour. Notable was the early movement on October 13 when 44 birds moved between 1000 and 1100 and 51 between 1100 and 1200. The almost perfect negatively skewed distribution curve peaking between 1400 and 1700 (MST) (**Figure 2**) is very close 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 9 was 4 days earlier than the average date; adult birds were 3 days later than average on October 11, while immature birds were 2 days earlier than average on October 6.



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

Figure 1

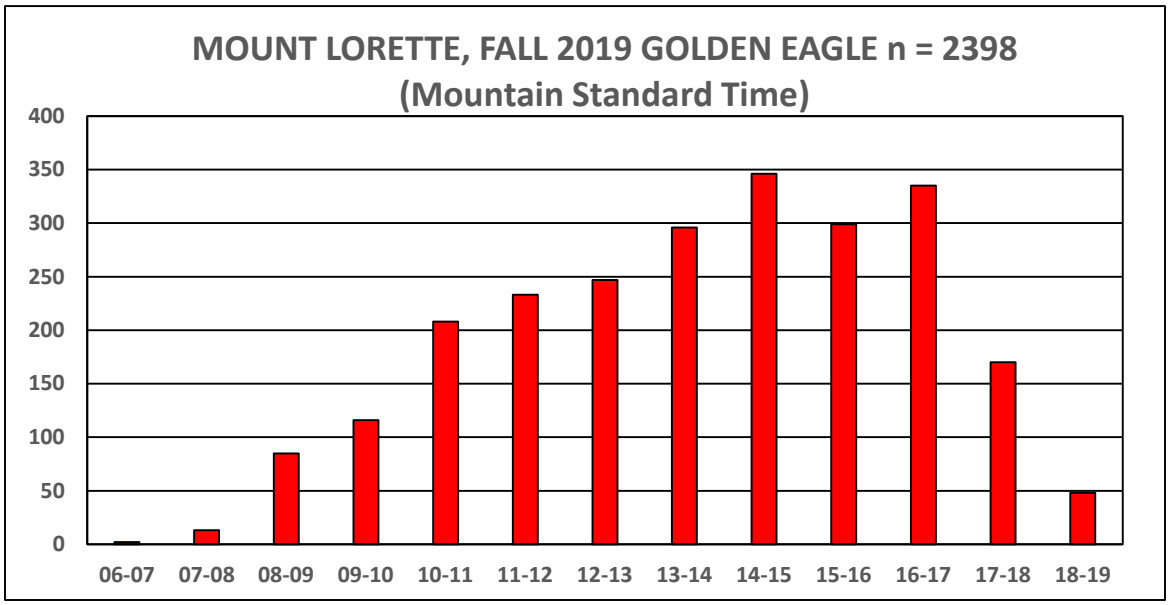


Figure 2

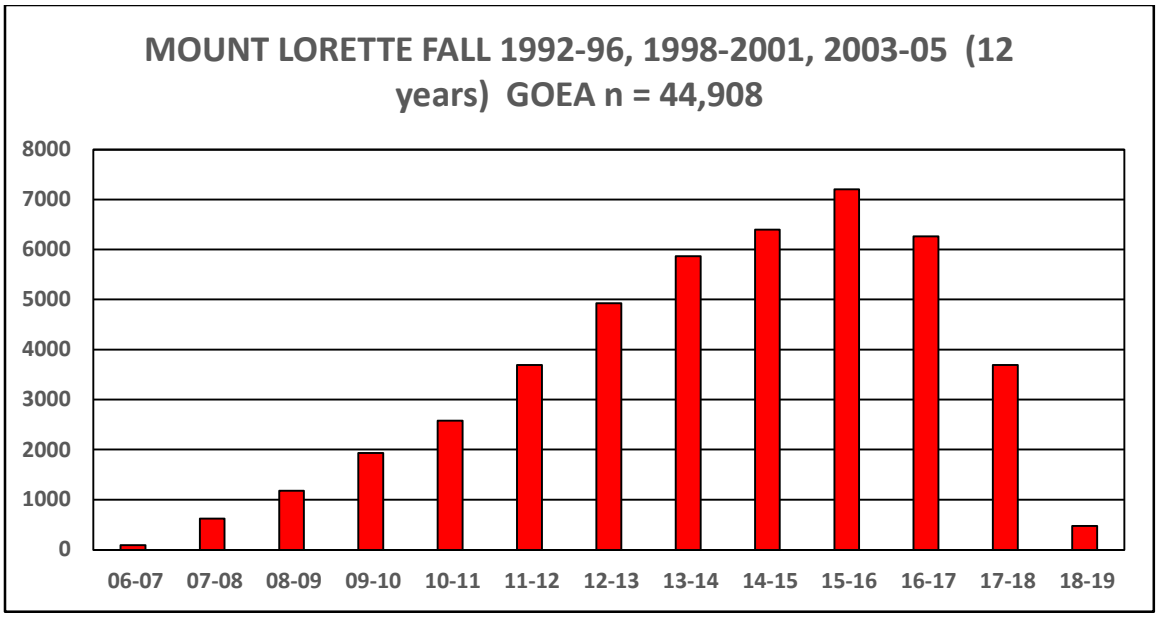


Figure 3

Fall Golden Eagle Trend

Figure 4 shows the linear trend of all counts at the site from 1993-2019 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 in 2017, this season's count was second year of another declining trend and was the second lowest valid fall count at the site and despite the relatively high age ratio it 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 2005[2]. 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.

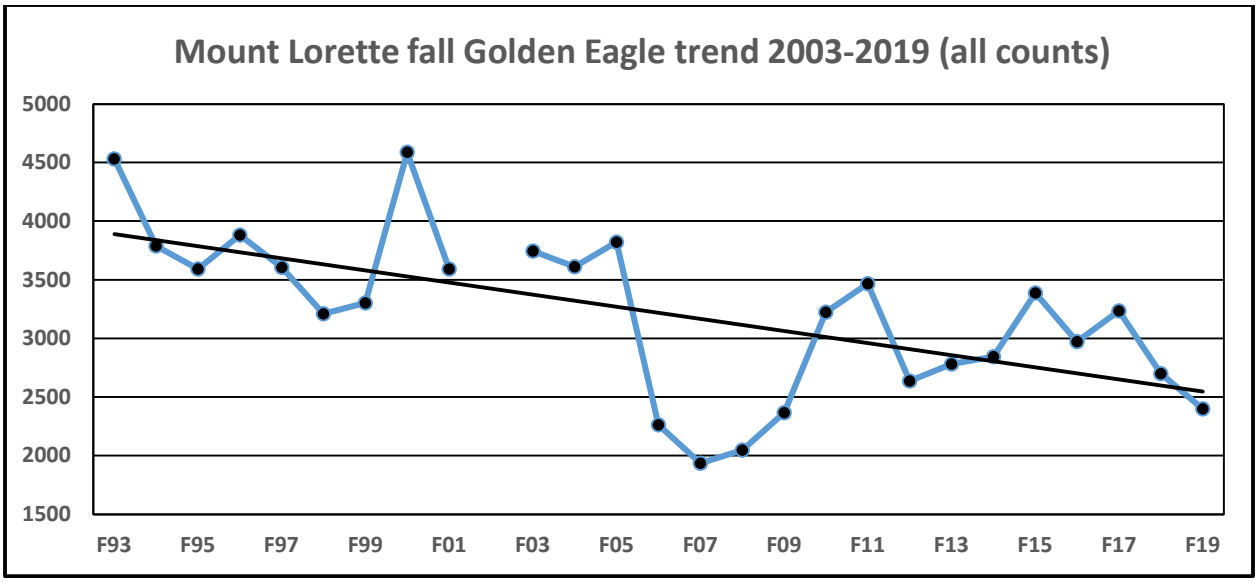


Figure 4

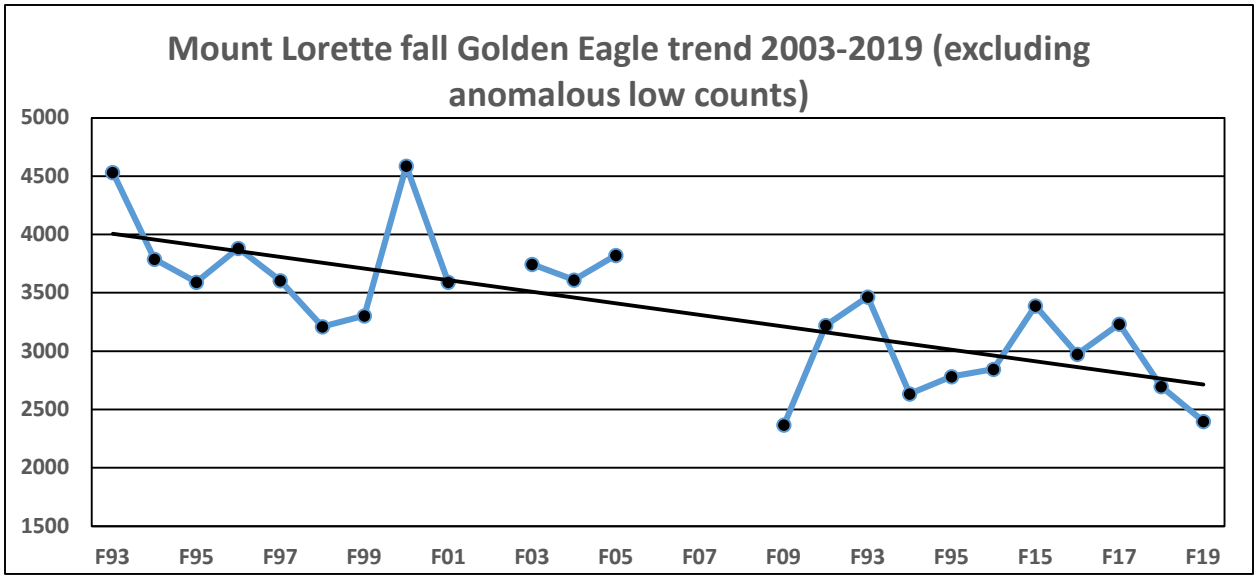


Figure 5

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 latest 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 marked the beginning of the next diminishing trend which is extended by the 2019 count. These trends (which are weakly paralleled by the spring trends) almost certainly reflect 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). The latest rising trend peaked in 2017, exactly 10 years after the previous peak in 2007. The cycle peaks seen during the 28 years of Alberta Front Range counts are 1999, 2007 and 2017 with 8 and 10 years respectively between the peaks.

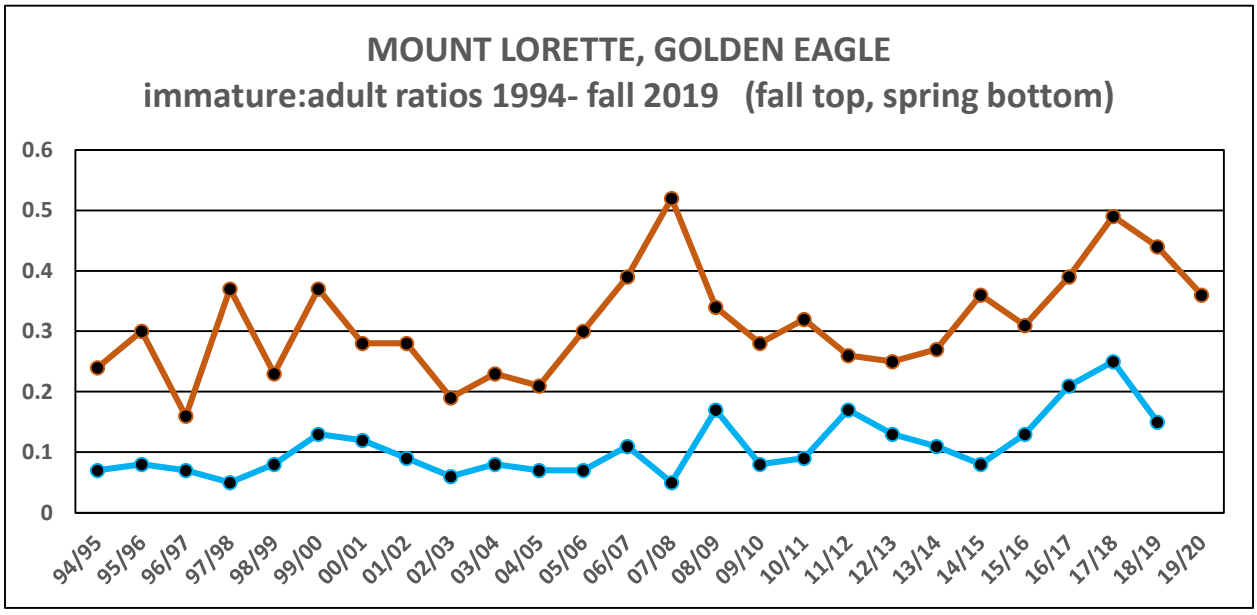
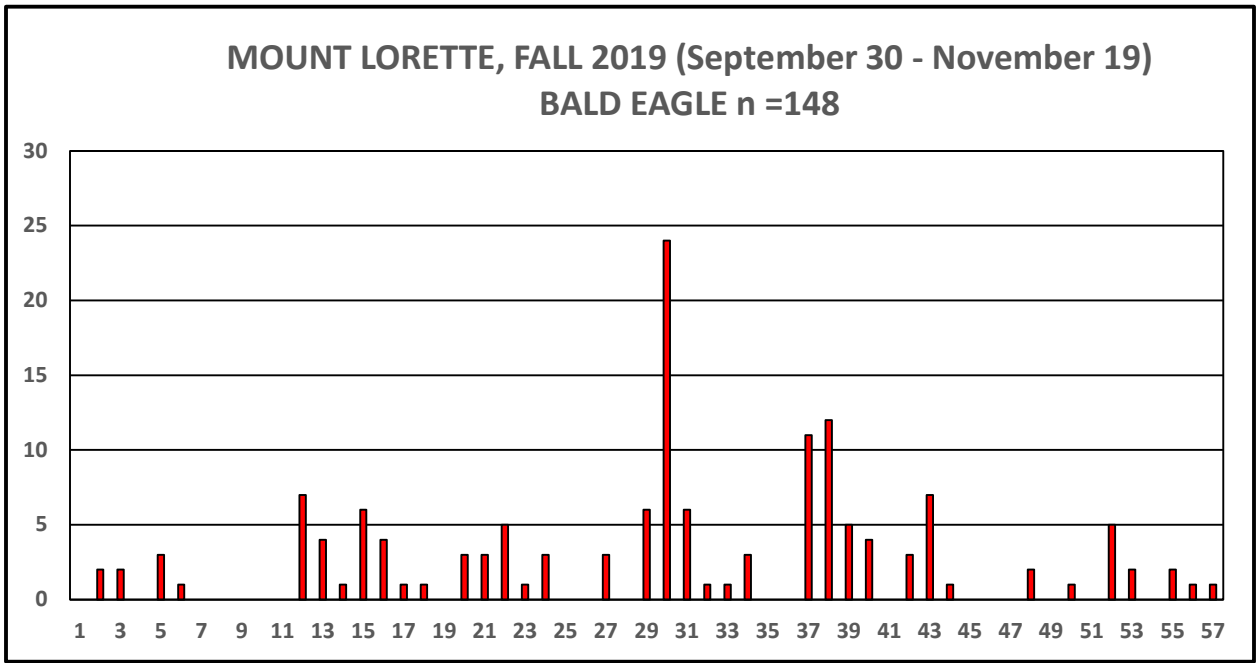


Figure 6

Bald Eagle

The count of 148 birds seen on 37 days between September 21 and November 15 was 37.2% below average **(Figure 7)** and was the 5th lowest fall count ever at the site. All 11 counts since 2009 have been lower than those of 1993-2005 with the exceptions of 1998 (174 birds) and 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 that has resulted 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 24 on October 19 which is 2% above the average high count for the site.

The monthly counts **(Table 5)** were 8 in September (-56.4%) that equals the second lowest ever September count, 118 in October -11.4%), and 22 in November (-68.7%) which is the lowest ever count for the month. Movement was meagre and sporadic throughout the count and the single high count of 24 on October 19 was exceptional. The flight comprised 83 adults, 21 subadults, 27 juveniles, 9 undifferentiated immature birds and 8 birds of indeterminate age giving an immature:adult ratio of 0.69 that is very similar to last year's ratio. The number of juvenile birds suggests a fairly successful breeding season. The median passage dates for the species, for adults and for immature birds was October 19, which were 4 days, 6 days and 1 day earlier than average respectively.



(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 A single bird was counted on September 30, a total that is 63.2% below average.

Northern Harrier A total of 7 birds were seen on 5 days between September 21 and October 30. The count is 56.7% below average. The highest daily count was 10 on September 23 and October 30. The median passage date for the species was October 1 which was 2 days earlier than the long-term average date. The flight comprised 1 adult female, 2 undifferentiated female/juveniles 1 juvenile and 3 indeterminate birds.

Sharp-shinned Hawk A total of 57 birds were counted on 21 days between September 21 and November 5. The count is 48.8% below average and the number of days on which they occurred is 25.4% below average. The highest single-day count was 10 on September 4, which is 58.7% below the average maximum count. The species median passage date was October 5 which was 3 days later than average and adult birds were 7 days later than average on October 10. The flight comprised 7 adults, 1 juveniles and 49 birds of unknown age that gives an immature:adult ratio of 0.14 which is 65.2% below average although, as usual, the high percentage of unaged birds means that this figure should be treated with caution. The monthly counts were 9 in September (-83.7% and the lowest September count ever), 48 in October (-31.1%), and 0 in November.

Cooper's Hawk A total of 8 single birds moved on 8 days between September 21 and October 20, which was 63.2% below average and equals the second lowest count at the site ahead of the 6 seen last year. The September count of 3 birds was 72.5% below average and equals the lowest September count ever, the October count of 5 birds was 50.5% below average and no birds were seen in November. The flight comprised 1 adult, 1 juvenile and 6 birds of unknown age. The median passage date for the species was October 5, 4 days later than average.

Northern Goshawk A total of 41 goshawks migrated on 22 days between September 22 and November 11. The total is 5.4% below average for the site and the days of occurrence is 6.2% above average. The highest single-day count was 4 on October 4 and 5 which is 30.6% below the average high count. The September count was 3 (-62.7%), the October count was 32 (+18.7%) and the November count was 6 (+3.3%). The flight comprised 21 adults, 5 juveniles and 15 birds of unknown age giving a juvenile: adult ratio of 0.24, which is 6.6% below average. The median passage date for the species was October 16, 5 days later than average, adults were 8 days later than average on October 19 and juveniles were 6 days later than average on October 16.

Broad-winged Hawk Not recorded this year. This is only the third time that the bird has not been seen on a fall count.

Swainson's Hawk Not recorded this year. It has occurred on seven previous counts within the present count period.

Red-tailed Hawk The count of just 11 birds on 8 days between September 21 and October 20 was the lowest ever fall count at the site and 66.7% below average. The highest daily count was 2 on September 21, October 1 and October 20, which is 71.2% below average. The September count of 4 was 77.3% below average and was the lowest September count ever, the October count of 7 was 51.6% below average, 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 October 1. The flight comprised 8 birds of the race *B.j.calurus*, 6 of which were light morphs (5 adults, and 1 indeterminate bird), 2 were dark morph birds (1 adults, 1 juvenile), 1 was a dark adult "Harlan's Hawk" (*B.j harlani*), and there were 2 indeterminate dark morph birds of unknown race, or age. The overall immature:adult ratio was 0.14 which is 69.3% below average.

Ferruginous Hawk A single adult light morph bird was seen on October 10. Single birds have been recorded on eight previous counts.

Rough-legged Hawk A total of 14 birds moved on 11 days between September 30 and November 14. The count is 71.9% below average and is the second lowest count ever at the site. The single-day high count was 2 on October 13, 17 and 27 which is 78.8% below the average high count and is the lowest ever high count for the species. The September count of 1 was 52.3% below average, the October count of 12 was 70.3% below average and equals the lowest ever October count and the November count of 1 was 82.1% below average. The median passage date for the species was average on October 17. The dark:light morph ratio was 0.09.

American Kestrel For the second consecutive year the species was not been recorded. Fifty-one birds have been recorded on 19 previous counts.

Merlin The total of 5 Merlins counted on 5 days between September 23 and November 2 was 33.1% below average. Three birds moved in September (+8.6%), 1 in October (-77.7%) and 1 in November (+133.3%). The flight comprised 2 birds ascribed to the race *F.c.columbarius* (1 adult male and 1 of indeterminate sex or age), and 3 birds were of indeterminate race, age or sex.

Gyrfalcon Not recorded this season. This is only the fifth year since 1993 that the species was not seen.

Peregrine Falcon A single juvenile bird was seen on October 5, a total that is 82.8% below average.

Prairie Falcon Single birds were seen on October 4 and 20, a total that is 10.6% below average

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

Observers at Mount Lorette

Principal Observers Caroline Lambert (14 days), Bill Wilson (10 days), Cliff Hansen and Rick Robb (9 days), George Halmazna (8 days), Blake Weis (8 days), Lori Anderson (5 days), Dan Parliament (5 days), Joel Duncan (3 days), Elly and Arnie Weisbrot (2 days).

Assistants Eric Langshaw (7 days), Brian McBride (5 days), Sandy Graham (4 days), Cliff Hansen (4 days), Dan Parliament (4 days), Ruth Morrow (3 days), Lori Anderson (2 days), Patrick Farley (2 days), Katherine Peterson (2 days), Rosemary Power (2 days), Glenn Webber (2 days), Gord and Marilyn Weber (2 days), Karen Anderson (1 day), Joel Duncan (1 day), Graeme Dunlop (1 day), Ronan Dugan (1 day), Caroline Lambert (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 (49º 27' 59" N 114º 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 360º 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 Kyllo 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 Kyllo Ridge cannot be seen. The western edge of Kyllo 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 Kyllo 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 were occupied on a given day. 2019 was the third consecutive complete count at the site and involved 54 of a possible 57 days between September 20 and November 15 observing exclusively from the Waterton 61 Wellsite on the western Flank of Vicki Ridge. This was supplemented by 23 partial-day counts at the western edge of the ridge complex near the Waterton 68 wellsite on October 2-5, 7, 10, 15-23, November 6-8 and 11-15. The 54 days spent at the site were +5.9% and the 482 hours +12.9% compared to the average of the previous two year's counts (2017 and 2018) **(Table 8)**.

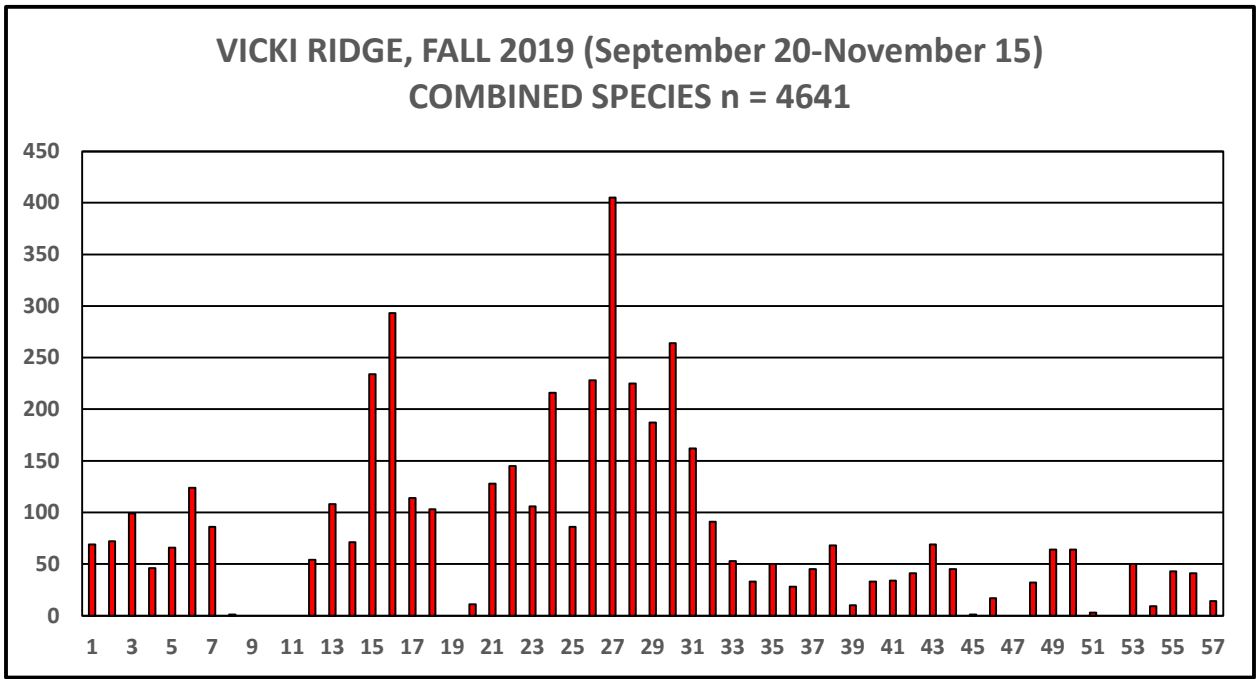
Weather and count summary

Table 9 summarizes the weather at the site. A total of 3 days were lost to heavy snowfall that completely obscured the ridge: September 28 and 29 when 1 metre of snow fell and October 8 that produced 40 cm of snow. Twenty-one active days (38.9%) saw precipitation in the form of rain, snow, sleet, hail or fog and led to significantly reduced observation hours on September 27 and 30, October 9 and 28, and November 3, 4, 5, 9 and 10. September high temperatures averaged 10.4 ºC (range 17.5 ºC to -3 ºC), October averaged 6.1ºC (range 15 ºC to -10 ºC) and November averaged 3.3 ºC (range 12.5 ºC to -17 ºC). The most common wind direction was WSW-W on 35 days (64.8%) followed by W-NW on 7 days (13%), with the remainder (22.2%) variable or NNE-SE. and winds gusted to at least 40 km/h on 38 days (70.4%), to at least 70 km/h on 14 days (25.9%) but they only gusted to 100 km/h on October 22. Only 4 days were completely cloudless (7.4%) and 44 days (81.5%) reached a cloud cover of 80-100% that were principally the high-wind cloud forms altostratus, altocumulus and lenticular that often formed a "Chinook Arch"

The final count was a record 4641 migrant raptors of 18 species at an average rate of 9.63 raptors/hour which is 8.8% lower than the average of the previous two years (**Tables 8** and **10)**. The highest single-day count of 405 raptors, which included 326 Golden Eagles occurred on October 16. All but three active viewing days (September 30, November 5 and 10) produced migrant raptors with an average daily count throughout the season of 85.9 birds. September produced 563 migrants at a rate of 7.3 raptors/hour (16.6% and 719.8% below average respectively), October produced 3626 migrants at a rate of 12.63 raptors/hour (6.4% and 1.3% above average respectively), and November produced 452 migrants at a rate of 3.9 raptors/hour

(+9% and -6% compared to average respectively). The combined-species median passage date was, as the last two years, October 15, and 5 days later than at Mount Lorette.

The final count of 4642 migrants of 18 species, with variance from the 2017-18 average count in parentheses, 3 Turkey Vultures (first for a complete count), 4 Ospreys (-57.9%), 427 Bald Eagles (+7.4%), 14 Northern Harriers (-17.6%), 513 Sharp-shinned Hawks (-25.5%) , 80 Cooper's Hawks (-4.8%), 102 Northern Goshawks (-53.8%), 4 unidentified *Accipiters* (-38.5%), 20 Broad-winged Hawks (-29.8%), 2 Swainson's Hawks (+33.3%), 137 Red-tailed Hawks (-33.2%), 7 Ferruginous Hawks (=), 458 Rough-legged Hawks (-3.7%), 6 unidentified *Buteos* (-72.7%), 2778 Golden Eagles (+17.3%), 28 unidentified eagles (+124%), 18 American Kestrels (+9.1%), 18 Merlins (-12.2%), 4 Gyrfalcons (-20%), 13 Peregrine Falcons (=), 3 Prairie Falcons (-60%), 2 unidentified falcons (=) and 1 unidentified raptor (-50%) TOTAL 4642 (+3.2%)



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

Figure 8

Species Accounts (numbers in parenthesis are the variances with the average of the 2017 and 2018 counts).

Turkey Vulture One immature bird seen on September 21 and 2 adults on September 22 were the first birds of the species seen on a complete fall count here.

Osprey A total of 4 birds (-57.9%) were counted on 3 days between September 20 and September 26 with 2 occurring on September 24. The median passage date was September 24, 2 days earlier than average.

Bald Eagle A total of 427 birds (+7.4%) moved on 47 days (+14.6%) between September 21 and November 15. Thirteen birds moved in September (-7.1%), 251 in October (+3.9%) and 163 in November (+14.8%), with a single-day high count of 36 on November 8. Eighteen days saw the passage of ten or more birds. The flight comprised 230 adults, 74 subadults, 101 juveniles, 3 undifferentiated immature birds and 19 indeterminate birds giving an immature:adult ratio of 0.77 (+29.4%), compared to 0.69 at Mount Lorette. The median passage date for the species was October 26 (4 days earlier than average), for adult birds it was 31 October (2 days later than average) and for immatures it was 19 October (11 days earlier than average).

Northern Harrier The count was 14 birds (-17.7%) that occurred on 10 days (-16.7%) between September 20 and November 4, with a single-day high count of 3 on September 20 and 24). The flight comprised 1 adult female, 9 juvenile birds (5 males and 4 females), 2 unaged birds (1 male and 1 female) and 2 indeterminate birds, giving an overall age ratio of 9 (+800%). The species median passage date was September 24, four days earlier than average and juveniles were 3 days earlier than average also on September 24.

Sharp-shinned Hawk A total of 513 birds (-25.5%) occurred on 34 days (-1.5%) between September 20 and November 11, with a single-day high count of 55 (-46.9%) on September 25. A total of 226 birds were counted in September (-28.5%), 281 in October (-24.5%) and 6 in November (+500%). The count comprised 143 adults, 15 juveniles and 355 indeterminate birds, giving an immature:adult ratio of 0.1 (+11.1%) although the high number of unaged birds means that this figure should be used with caution. The median passage date for the species was October 3 (1 day later than average), for adults it was October 4 (2 days later than average), and for juvenile birds it was September 22 (1 day earlier than average).

Cooper's Hawk A total of 102 birds (-4.8%) occurred on 26 days (= average) between September 20 and October 22, with a single-day high count of 10 (+5.3%) on September 25. A total of 36 birds were counted in September (-12.2%) and 44 in October (+2.3%). The flight comprised 37 adults, 7 juveniles and 36 indeterminate birds, which gives an immature:adult ratio of 0.19 (+18.8%). The species median passage date was October 2 (1 day later than average), adults were also October 2 (3 days later than average) and immature birds were September 25 (3 days later than average).

Northern Goshawk A total of 103 birds (-5.5%) occurred on 35 days (-12.5%) between September 20 and November 15, with a single-day high count of 19 (-14.3%) on October 20. A total of 11 birds were counted in September (-52.2%), 61 in October (-15.9%) and 30 in November (+185.7%). The flight comprised 80 adults, 13 juveniles and 9 indeterminate birds, which gives an immature:adult ratio of 0.16 (-31.9%). The species median passage date was

October 22 (5 days late), adults were October 23 (6 days late) and immature birds were October 17 (6 days late).

Broad-winged Hawk A total of 20 birds (-29.8%) occurred on 15 days (+20%) between September 22 and November 1, with a single-day high count of 3 (-50%) on October 22. A total of 4 birds were counted in September (-70.4%), 15 in October (= average), and 1 in November. The flight comprised 17 light morph birds (11 adults and 6 juveniles) and 3 dark morphs (2 adults and 1 indeterminate) giving an immature:adult ratio of 0.46 (-15.6%). The species median passage date was October 16 (16 days later than average), adults were October 19 (20 days later than average) and immature birds were October 12 (15 days later than average).

Swainson's Hawk Single adult light morph birds were seen on September 23 and September 24 (+33.3%).

Red-tailed Hawk A total of 137 birds (-33.2%) occurred on 27 (-15.6%) days between September 20 and October 26, with a single-day high count of 18 (-43.8%) on September 26. A total of 73 birds were counted in September (+20.7%) and 64 in October (-55.2%). The flight comprised 104 birds of the race *B.j.calurus*, 80 of which were light morphs (71 adults, 5 juveniles and 4 indeterminate birds), 2 were adult rufous (intermediate) morphs, and 22 were dark morphs (20 adults and 2 juveniles); 1 juvenile was an "Eastern Red-tailed Hawk" (*B.j,borealis*), 2 adults were "Krider's Hawks" (*B.j.borealis* var *krideri*) and 29 birds were of the race *B.j.harlani*, 28 of which were dark morphs (26 adults and 2 juveniles) and 1 was a light morph juvenile; 1 bird was of indeterminate race, morph or age. The overall immature:adult ratio was 0.08 (-40.7%). The species median passage date was September 26 (8 days earlier than average), adults were 3 days earlier than average on October 2 and juveniles were 10 days earlier on September 4. The median passage date for *calurus* was September 26 (9 days earlier than average) and *harlani* was October 14 (5 days later than average).

Ferruginous Hawk A total of 7 birds (= average) occurred on 5 days (-9.1%) between September 20 and October 19, with a single-day high count of 2 (-20%) on September 22 and 25. Five birds occurred in September (+66.7%) and 2 in October (-50%). The flight comprised 5 light morph birds (1 adult, 4 juveniles) and 2 dark morph adults, giving an immature:adult ratio of 1.3 (+390.6%). The species median passage date was September 25 (8 days earlier than average) and juvenile median passage was September 22.

Rough-legged Hawk A total of 458 birds (-3.7%) were observed on 41 days (+9.3%) between September 22 and November 15, and the highest single-day count was 74 (+21.3%) on October 19. A total of 5 birds were counted in September (-9.1%), 399 in October (-9.1%) and 54 in November (+74.2%). The flight consisted of 393 light morphs, 39 dark morphs and 26 undetermined morphs giving a light:dark ratio of 0.1 (= average). The species median passage date was October 19 (2 days earlier than average).

Golden Eagle A total of 2778 birds (+17.3%) occurred on 48 days (+3.2%) between September 20 and November 15, with a single-day high count of 326 (-20.5%) on October 16 **(Figure 9)**. There were 9 other there three-figure counts: 165 on October 4, 227 on October 5, 109 on October 10, 134 on October 11, 173 on October 13, 208 on October 15, 144 on October 17, 116

on October 18 and 126 on October 19. The September count was 140 (-4.4%), October yielded 2454 birds (+22.6%) and 184 moved in November (-16.4%). The flight comprised 1918 adults, 219 subadults, 463 juveniles and 178 indeterminate birds, which gives an immature:adult ratio of 0.36 (-26.5%) and a juvenile: adult/subadult ratio of 0.22 (-21.4%).These compare to the almost identical ratios of 0.36 and 0.21 respectively at Mount Lorette. The median passage date for the species and for adult birds was October 15 (average and 3 days earlier than average respectively), and immature birds were 2 days earlier than average on October 10. Subadult bird movement was average on October 11 and juveniles were 2 days earlier than average on October 10.

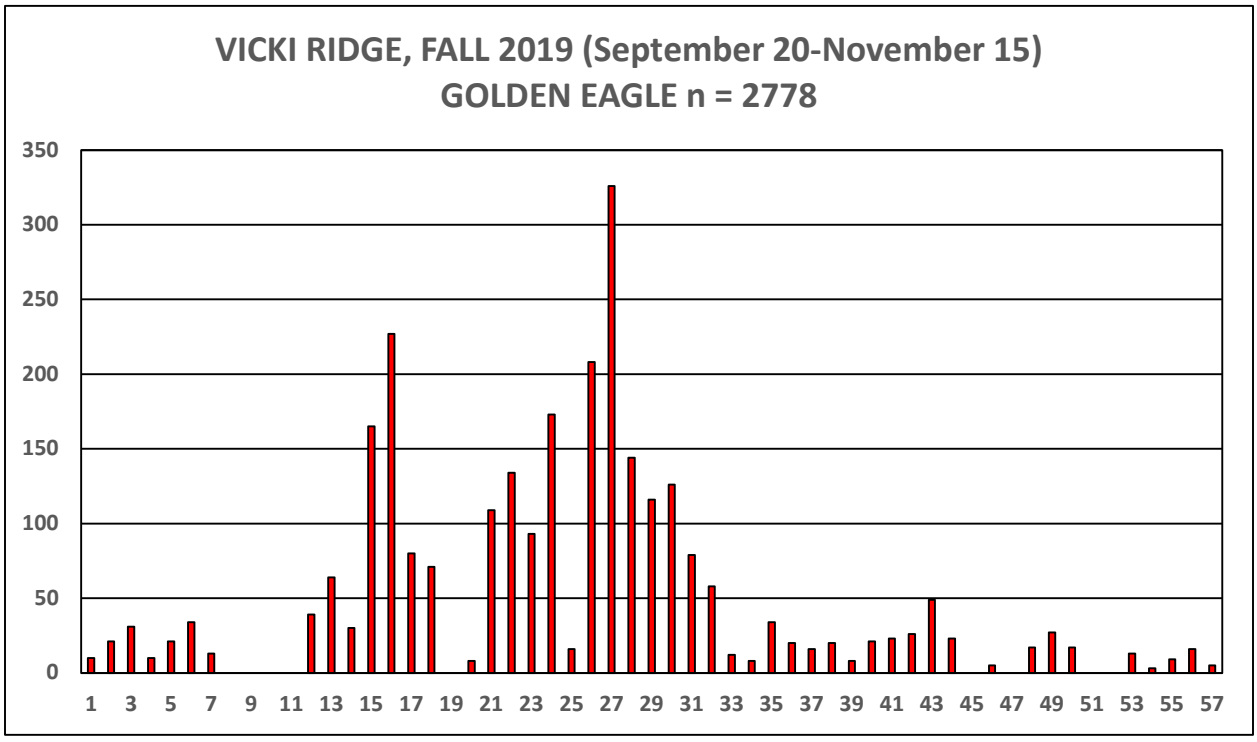


Figure 9

American Kestrel A total of 18 birds (+9.1%) occurred on 10 days (+11.1%) between September 20 and October 13, with a single-day high count of 5 (+11.1%) on September 20. The flight comprised 6 males, 7 females and 5 birds of undetermined sex giving a female:male ratio of 0.78 (-45.8%). The median passage date for the species was September 23, 4 days earlier than average.

Merlin A total of 18 birds (-12.2%) were counted on 12 days (-14.3%) between September 22 and October 26 with a single-day high count of 3 birds (-14.3%) on October 13. The flight comprised 16 birds of the race *F.c.columbarius* (6 males (1a, 6 indeterminate), 7 females (1

adult, 5 indeterminate) and 2 birds of unknown age or sex, and 1 adult male of the race *F.c.richardsonii*. The median passage date for the species was October 13, 15 days later than average.

Gyrfalcon A total of 4 birds (-20%) occurred on 4 days between October 1 and 19. Two birds were grey morphs (1 adult female and 1 indeterminate bird) and 2 were white morphs (1 adult female and 1 indeterminate bird). The species median passage date was October 3, 20 days earlier than average.

Peregrine Falcon A total of 13 birds (= average) occurred on 11 days (= average) between September 21 and November 13, with a single-day high count of 2 on September 22 and October 18. The flight comprised 7 males (6 adults, 1 indeterminate), 5 females (4 adults, 1juvenile) and 1 adult bird of indeterminate sex, giving an immature:adult ratio of 0.09 (-72.3%). The median passage date for the species and adults was October 18, 17 days and 22 days later than average respectively.

Prairie Falcon Three birds (-60%) occurred on 3 days (-57.1%) between September 20 and October 19.

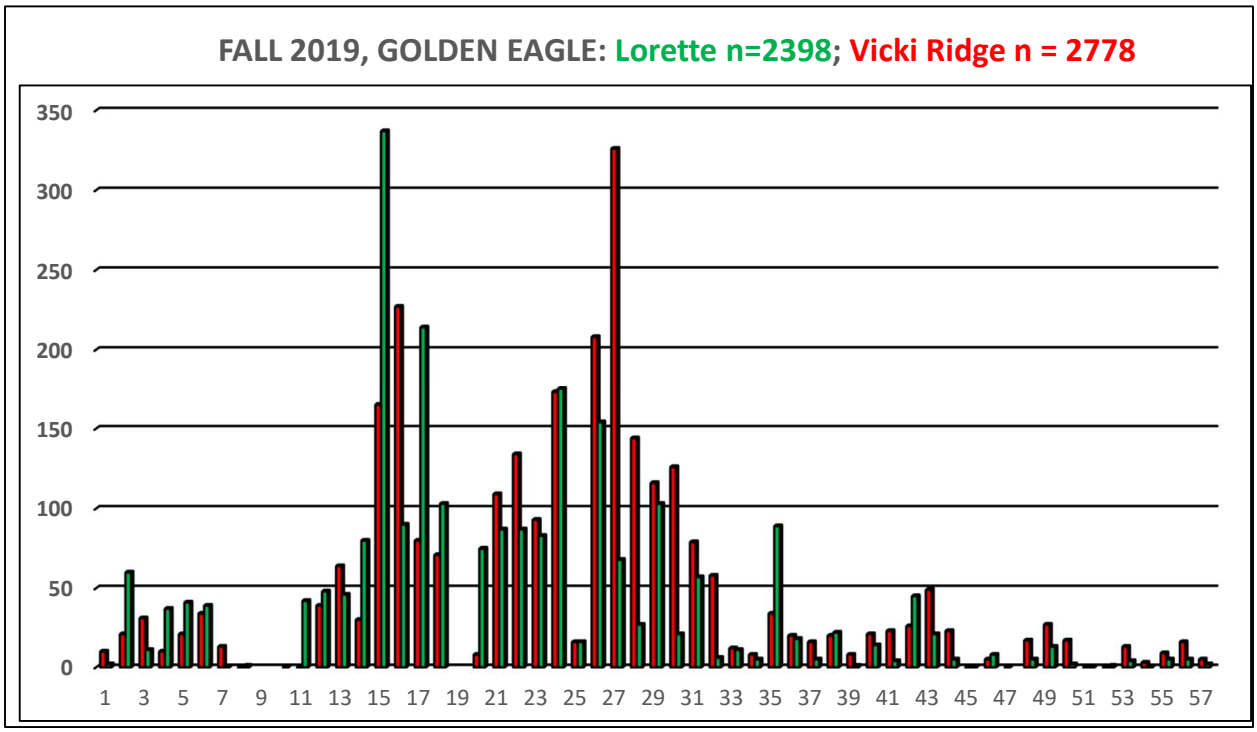
Also recorded were 4 undifferentiated *Accipiters* (-38.5%), 6 undifferentiated *Buteos* (2 light, 4 dark) (-72.7%), 28 undifferentiated eagles (+124%), 2 undifferentiated Falcons (= average) and 1 unidentified raptor (-50%).

Comparison of Eagle Species at Vicki Ridge and Mount Lorette

In 2018 for the first time the Golden Eagle counts at Vicki Ridge (2735) and at Mount Lorette (2698) were very similar and 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. This year Mount Lorette (2398) recorded 380 fewer Golden Eagles than did Vicki Ridge (2778), but the age ratios at the two sites are almost identical and each shows a similar diminution from last year's highly successful breeding season: at Vicki Ridge the immature:adult ratio was 0.36 and the juvenile: adult/subadult ratio was 0.22, compared to the almost identical ratios of 0.36 and 0.21 respectively at Mount Lorette. Despite these similarities, however, at Vicki Ridge the median passage date for the species was, as last year, October 15 but at Mount Lorette the species median passage date was six days earlier on October 9. The highest single day count at Mount Lorette was 337 on October 4, but at Vicki Ridge the maximum count was a similar 326 birds but occurred 12 days later on October 16 **(Figure 10A)**. These differences are clearly shown in **Figure 10B** that is a cumulative difference graph for the species at the two sites. Between September 20 and October 2 the count rate was similar at the two sites; between October 3 and 9 Lorette (899) recorded 318 more Golden Eagles that Vicki ridge (581); between October 10 and 14 the counts at both sites were almost identical but between October 15 and 21 Vicki Ridge (848) recorded 567 more Golden Eagles than Mount Lorette (282) and subsequently the daily counts at Vicki Ridge were slightly higher than those at Mount Lorette to the end of the count on November 15. It seem highly unlikely that observers at Vicki Ridge would have substantially

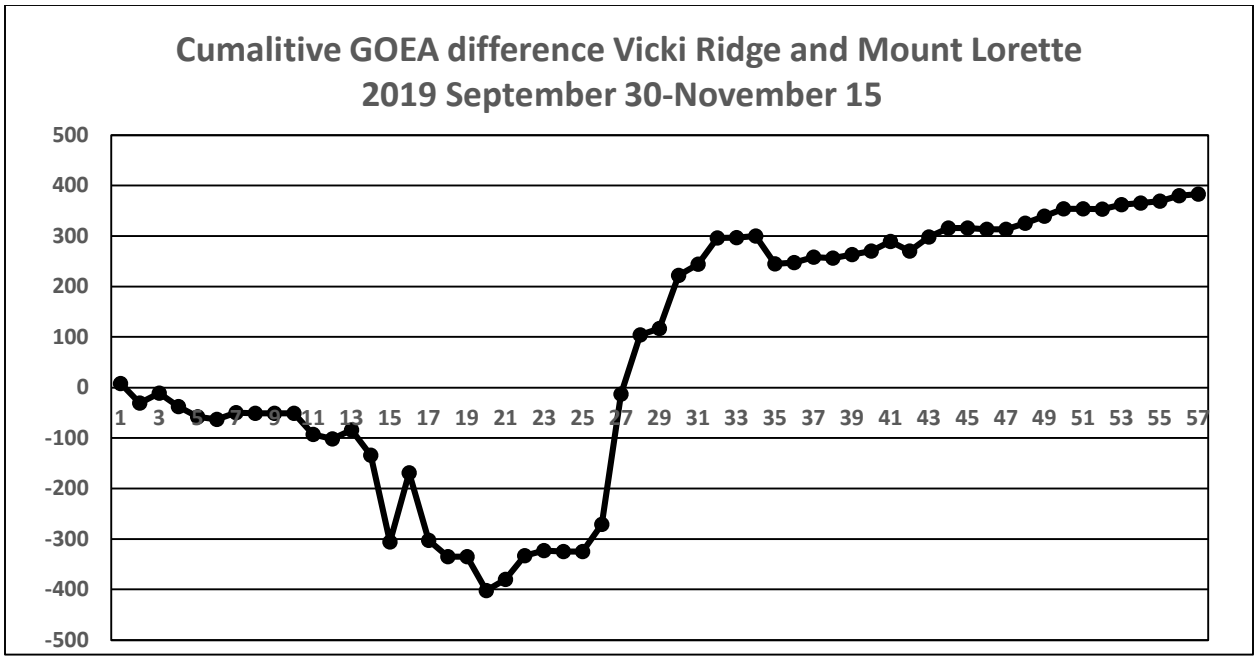
missed the birds seen at Mount Lorette on October 4, and similarly that observers at Mount Lorette would have completely missed the birds that peaked at Vicki Ridge on October 16. The likely explanation is that poor weather between the sites delayed the movement of the birds and there is some indication that low cloud persisted over the high mountains in the Highwood Pass area during this period.

As in the previous two years over twice as many Bald Eagles were counted at Vicki Ridge (427) than at Mount Lorette (148) **(Figure 11)**. The species was scarce at both sites in September with Lorette recording 8 birds and Vicki Ridge 13; in October Mount Lorette counted 118 birds while 251 occurred at Vicki Ridge, but the greatest disparity is November when only 22 birds were counted at Lorette compared to 163 at Vicki Ridge that included the two highest daily counts of the season. The count at Mount Lorette was 34.7% of that at Vicki Ridge and the age classes recorded show similar differences: adults 36.1%, subadults 28.4%, and juveniles 26.7% The immature:adult age ratio was 0.77 at Vicki Ridge and 0.69 at Mount Lorette which are broadly similar. As with the Golden Eagle count the greatest disparity between the sites was the median passage dates for the species. At Vicki Ridge the median passage date was October 26, but at Mount Lorette the median passage dates for the species was October 26 which reflects the disparity in the November counts at the two sites.



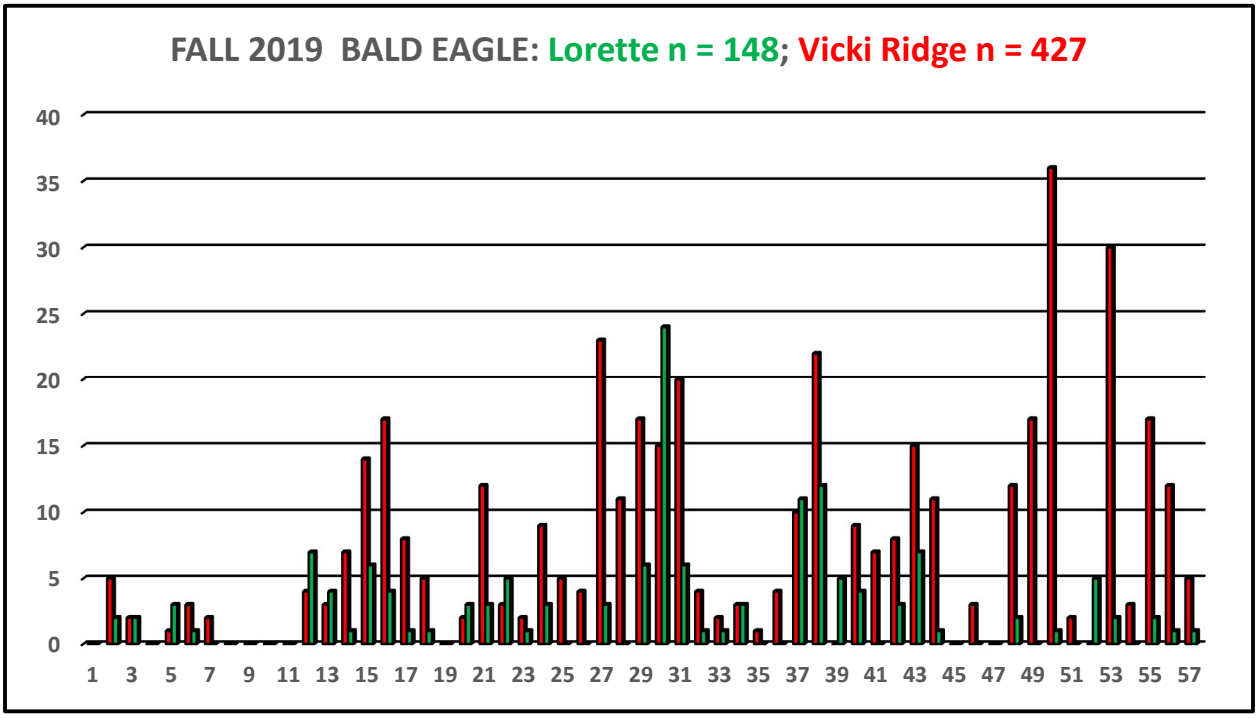
(1 = September 20, 12 = October 1, 43 = November 1)

Figure 10A



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

Figure 10B



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

Figure 11

Observers

Principal Observers at Waterton 61 site: Peter Sherrington and Hilary Atkinson (54 days)

Principal Observer at Waterton 68 site: Gord Petersen (23 partial days)

Assisted by Raymond Toal (9 days), Gord Petersen (7 days),), Denise Cocciolone-Amatto (5 days), Trevor Lewis (4 days), Phil Nicholas (3 days), Doug and Teresa Dolmen (1 day), Patricia and Patrick Farley (1 day), Pat Lucas (1 day), Asher Warkentin (1 day), Marilyn and Gord Weber (1 day).

Steeples 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 about 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 and Vicki Ridge sites in SW Alberta giving the possibility of simultaneously monitoring movement along the eastern and western flanks of the Rocky Mountains at the same latitude. This year all of the 34 days in the field were spent at the Bill Nye site (49 º 45' 11.10''N, 115 º 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 6.9 km from the Lazy Lake Road turn off on Wasa Lake Park Drive on the southern edge of Wasa Lake. The site is located by turning right into a clearing at 2.2 km from the turnoff and a full 2.3 km takes you to the site. The site offers views of the birds as they pass over, or in front of, the main ridge that has an average elevation of 1856 m. Mount Bill Nye is 2648 m high though only the most westerly visible craggy peak at 2419 m is visible from the site. The road is somewhat rough but does not require a 4WD vehicle unless the conditions are excessively snowy or wet.

The fall 2019 season is the eleventh extended reconnaissance count conducted at the site (**Table 13**), and comprised 34 days and 143.5 hours of observation which are 4.3% and 14.3% above average respectively. Vance Mattson was the principle observer each day. Virginia Rasch, of the Rocky Mountains Naturalists, acted as a spotter on 2 days (October 4 and 12), and Kehulani Keeling and John and Doreen Mattson assisted on October 12 and 13. Twenty-three days were lost, 6 to inclement weather and 17 because of teaching or other commitments. Observation

usually occurred between approximately 1300 and 1800, except for Mondays and Wednesdays when observation could not commence until 1600 owing to work commitments. These late starts obviously affected migrant totals.

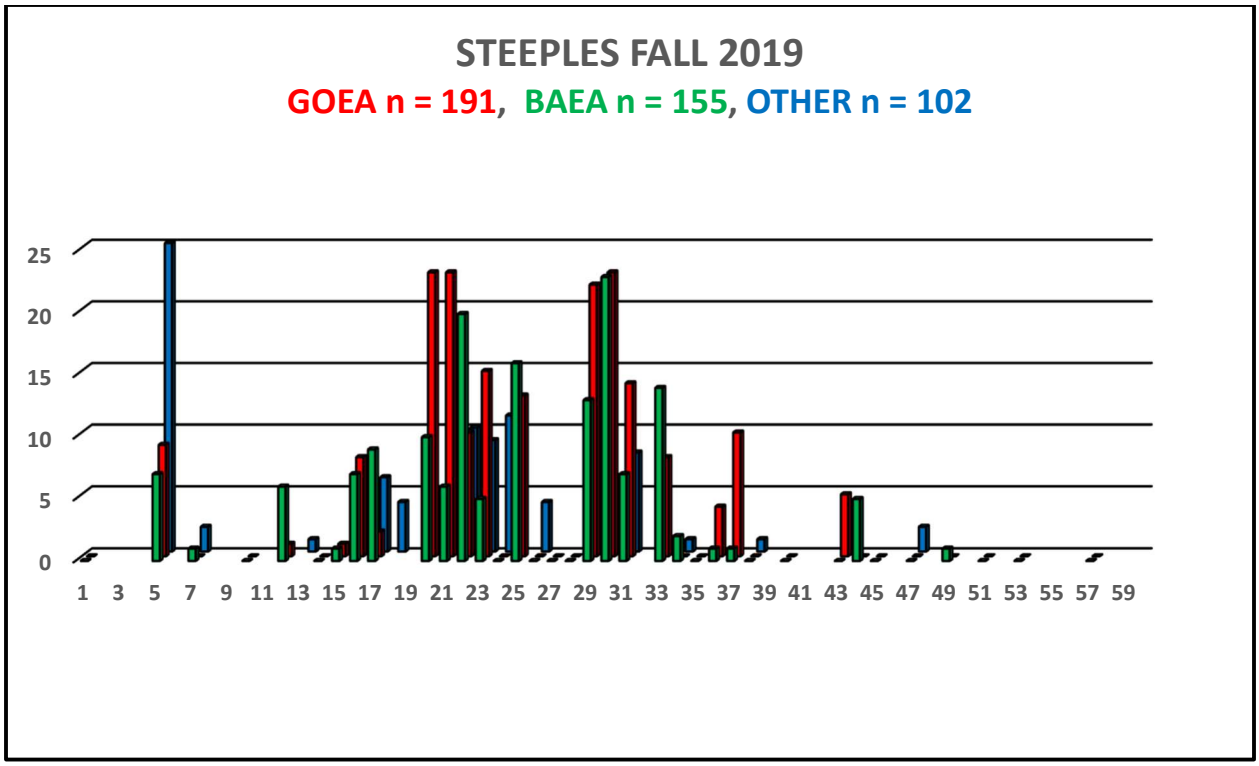
Weather and count summary

Table 12 summarizes the weather at the site. A total of 6 days October 8, November 10 and 12-15, were lost to snow that completely obscured the ridges. Rain showers occurred on October 22 days but otherwise active days saw no precipitation. The average high temperature for September was 13.3 ºC (range 7 to 17 ºC), for October it was 7.3 ºC (range -3 to 14 ºC) and November was cooler with an average of 4.4 ºC (range -4 to 7 ºC). Conditions were assessed as calm 64.7% of the time, S-SW winds 11.8%, S winds 8.2%, and variable and other directions 14.5%. Wind velocities were assessed as calm to light 64.7% of the time, calm to moderate or strong 5.9%, light to moderate 5.9%, moderate 14.7%, moderate to strong 5.9% and strong 2.9%. The mountain ridges on active days were assessed as clear 91.2% of the time, partly clear 5.9% and obscured 2.9% of the time.

The total of 448 migrant raptors is 18.6% above average and is the fourth highest fall count for the site, and the rate of 3.12 raptors/hour is 1.4% above average. The count got off to a promising start with 41 migrants of 7 species seen on September 24 including 25 non-eagles that proved to be almost 25% of the final non-eagle total. The highest daily total occurred on October 19 with 54 migrants that included 23 Bald Eagles and 23 Golden Eagles. The most concentrated raptor movement was October 9-12 with 158 migrants and October 18-20 with 112 migrants and accounts for 60% of the entire count. This period roughly coincides with the main raptor movement in previous years. The total included 325 eagles that made up 78.6% of the count compared to an average of 70.6% for the 2014-2018 counts. The 2019 increase in the percentage of eagles is partly explained by lower-than-average counts of Red-tailed Hawks and Sharp-shinned Hawks.

The final count of 448 raptors of 12 species (with variance from the 2009-2018 10-year average) was 1 Turkey Vulture (+66.7%), 2 Ospreys (-20%), 155 Bald Eagles (+1.04%), 13 Northern Harriers (+141%), 38 Sharp-shinned Hawks (-5.9%), 4 Northern Goshawks (-20%), 1 unidentified *Accipiter*, 25 Red-tailed Hawks (-5.7%), 3 Rough-legged Hawks (-53.1%), 1 unidentified *Buteo*, 191 Golden Eagles (+47.2%), 6 unidentified eagles (+445%), 5 American Kestrels (+108%), 1 Merlin (+25%) and 2 Peregrine Falcons (+233%) Species previously recorded but absent this fall were Cooper's Hawk, Broad-winged Hawk, Gyrfalcon, and Prairie Falcon. Swainson's Hawk and Ferruginous Hawk have never been recorded at the site.

(Tables 11 and 13, and figure 11).



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

Figure 12

Turkey Vulture The only record was a single bird on October 12 that was the 7th fall record for the site.

Osprey Single Ospreys were seen on September 24, and October 12. The total is 20% below average.

Bald Eagle The total of 155 birds counted on 20 days between September 24 and November 7 is close to average (+1%). The highest single-day counts were 20 on October 11 and 23 on October 19. The flight comprised 92 adults, 6 subadults and 55 juveniles giving an immature:adult ratio of 0.66 compared to 0.69 at Mount Lorette and 0.77 at Vicki Ridge.

Northern Harrier The total of 13 birds counted on 7 days between September 24 and November 3 was the third highest count for the site and 141% above average. The highest single-day count was 4 on October 19. The flight comprised 5 adult females, 7 unsexed juveniles and 1 indeterminate bird.

Sharp-shinned Hawk The total of 38 birds seen on 9 days between September 24 and October 19 was 5.9% above average. The highest single-day count was 13 on September 24, the first day of the count. The flight comprised 15 adults, 2 juveniles and 21 indeterminate birds.

Cooper's Hawk Not recorded this season. Up to 4 birds have been seen on 5 previous counts

Northern Goshawk Four birds were seen on 4 days between October 5 and 26. The total is 20% below average. The flight comprised 2 adults and 2 indeterminate birds.

Broad-winged Hawk Not recorded this season. Five birds were counted in 2017 and 3 in 2018.

Swainson's Hawk Never recorded on the count.

Red-tailed Hawk After last year's record count of 75 birds this season saw only 25 birds move on 7 days between September 24 and October 11. The total is 5.7% below average. The high count was 9 on September 24 and 8 were seen on October 9. All birds were of the race *B.j.calurus* and comprised 21 light morphs (15 adults, 4 juveniles and 3 indeterminate birds) and 3 adult dark morph birds.

Ferruginous Hawk Never recorded on the count.

Rough-legged Hawk The count was only 3 birds: a dark morph on October 9 and a light and dark morph on October 10. The total is 53.1% below average.

Golden Eagle The total of 191 birds counted on 17 days between September 24 and November 1 was the third highest count ever and is 47.2% above average. The highest single-day count was 23 that occurred on three days: October 9, 10 and 19 which together with the 22 counted on October 18 comprised 47.6% of the flight. The flight comprised 129 adults, 8 subadults, 43 juveniles and 11 indeterminate birds giving an immature: adult ratio of 0.41, compared to a ratios of 0.36 both at Mount Lorette and at Vicki Ridge.

American Kestrel The count of 5 birds (2 female, 1 male, 2 indeterminate) seen on 5 days between September 24 and October 11 was the third highest ever at the site and 108% above average.

Merlin A single *columbarius* Merlin of undetermined age or sex was seen on October 5. The count is 25% below average.

Gyrfalcon Not recorded this season. The only record for the count was a grey morph bird on October 13, 2018.

Peregrine Falcon Two birds, 1 juvenile and 1 unaged, were seen on October 11 that furnished the 7th and 8th records for the site. The total is 233% above average and equals the previous highest counts in 2016 and 2017.

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

Also recorded were 1 unidentified *Accipite*r, 1 unidentified *Buteo* and 6 unidentified eagles.

Observers

Vance Mattson (34 days), assisted by Virginia Rasch (2 days), Kehulani Keeling (2 days) and John and Doreen Mattson (2 days).

Appendix (separate attachment)

List of Tables