

MOUNT LORETTE AND BEAVER MINES, ALBERTA, AND STEEPLES BC,
SPRING 2020

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Summary and highlights

Following a reconnaissance count at the site in 1992, this was the 28th consecutive year that a systematic spring count has been held at Mount Lorette. It is the 10th consecutive extended (as opposed to complete) count at the site and, as started in 2011, the count period was again March 1 to April 22. All three counts experienced several periods of snow that were mainly coincident at all sites and a record 8 days (which could well have been 10 or 12) were lost at Mount Lorette. Temperatures at the Alberta sites were below average throughout and as a result almost no rain occurred. Temperatures at Steeples were closer to normal and winds were usually calm or light to moderate, in contrast to the Alberta sites where winds were mainly moderate to very strong, although favourable SSW-W winds were below average at both sites.

At Mount Lorette the combined species count of 1856 birds of 14 species was 41.8 % below average and was the lowest total ever for a valid count at the site. The Golden Eagle count of 1529 was 46.8% below average and the March count of 1162 was 50.7% below average. The highest single day count of 173 on March 16 was the lowest ever (-55.4%), and the species median passage date was 1 day earlier than average on March 22. The immature:adult ratio of 0.21 did not reflect the declining trend seen in the fall 2018 count. The low Golden Eagle total produced a slight declining trend in the counts since 2003 which had previously suggested a stabilizing of the population. Whether this is an anomaly produced by a season plagued by bad weather remains to be seen. Bald Eagle numbers (157) were also 9.1% below average, but surprisingly 8 of the non-eagle species

occurred in above-average numbers. Most species moved significantly later than average.

Beaver Mines extended its count period from February 23 to May 3 and as a result recorded a new site record count of 2348 birds of 18 species. Unlike the other two counts one-third of the migrants were non-eagles and 11 species had new record counts for the site. At Steeples 66.5% of raptor movement occurred on 11 days between March 15 and 25 that included 240 Golden Eagles but subsequently movement dwindled rapidly. Data from all three sites again suggest significant shifts in the main migration route during the season, probably related to weather.

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 northeast 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 an elevation of 1433 m. The site gives 360-degree 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 the north end of the Fisher Range and Mount Lorette. 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.

Migrating Golden Eagles were first seen moving over Mount Lorette on March 20, 1992, and the first extended (33 day, 280 hour) count was conducted the following fall and yielded 2661 migrant raptors of which 2044 were Golden Eagles¹. Until

2007, full-season spring counts were conducted annually at Mount Lorette, with an average time spent at the site of the 15 counts of 79.9 days (863.5 hours). From 2006 to 2009 the principal fall observation site was moved to the Piitaistakis-South Livingstone location close to the Municipality of Crowsnest Pass in SW Alberta, during which time extended comparison counts were conducted at Mount Lorette during the main period of the Golden Eagle migration. In each of the four years the Piitaistakis-South Livingstone site produced significantly higher numbers of Golden Eagles and other raptor species than at Mount Lorette. Complete spring counts were also conducted at the site in 2008 (February 20 to May 19: 84 days, 975.5 hours), 2009 (February 15 to May 25: 87 days, 993 hours) and 2010 (February 15 to May 21: 88 days, 1015 hours). These counts yielded 4204 raptors (2981 Golden Eagles), 3837 raptors (2737 Golden Eagles) and 3039 raptors (2185 Golden Eagles) respectively.

At Mount Lorette comparative counts in 2008, 2009 and 2010 were conducted between March 01 and April 15 and comprised 40 days (493.3 hours), 41 days (458.7 hours) and 46 days (519 hours) of active observation respectively. These counts yielded (with numbers from the same time period at Piitaistakis-South Livingstone in parenthesis) in 2008 1171 (2582) Golden Eagles and 111 (537) other raptors; in 2009 882 (2422) Golden Eagles and 118 (544) other raptors, and in 2010 1160 (1967) Golden Eagles and 152 (464) other raptors. **Table 2** summarizes all the spring counts since 1992 conducted at Mount Lorette to date. It is clear that the counts conducted in 2008, 2009, 2010 and also 2012 are anomalously low compared to all other counts at the site. The combined species count for the years 2008, 2009, 2010 and 2012 (with comparison for Golden Eagle in parentheses) are only 39% (39%), 30.5% (29.4%), 40% (43.7%) and 37.7% (33.3%) respectively of the average for the counts from 1993 to 2007 and 2011. By contrast the fifth lowest spring count at the site in 2007 is 68.2% (65.6%) of average. The anomalous nature of these four counts probably results from a combination of poor weather conditions and, in some cases, observer inexperience but, whatever the cause, it seems prudent at this time to exclude these counts from the statistical comparisons with subsequent counts.

The spring 2011 count was conducted between March 01 and April 22, one week longer than those from 2008-2010, and all subsequent counts have been conducted using the same time period. **Table 3A** summarizes all the counts conducted at Mount Lorette for the period March 1 to April 22 1973-2020. **Table 3B** excludes the anomalously low counts of 2008, 2009, 2010 and 2012 on which the data variances of the current count (number, median passage dates and age ratios) are based unless otherwise stated.

This report concerns counts conducted between March 1 and April 22 at Mount Lorette, a 45-day extended reconnaissance count conducted by Vance Mattson at the Steeples site on the western flank of the Rocky Mountains in British Columbia, and a 69-day count between February 23 and May 3 at Beaver Mines in SW Alberta.

At Mount Lorette observers spent a total of 45 days (527.4 hours) of a possible 53 days at the site between March 1 and April 22, with the days and hours being 9.7% and 5.3% below the average of valid counts since 1993 respectively.

After reconnaissance counts were conducted by Peter Sherrington at Beaver Mines in 2014 and 2015, full counts were made from 2016, to 2019 and this year the count was conducted between February 23 and May 3 and comprised 69 days of a possible 71 days (877.7 hours), which are 36.4% and 88.1% above the 2015-2019 average respectively.

The eleventh consecutive Steeples extended reconnaissance count in BC conducted by Vance Mattson between March 1 and April 22 comprised 42 days of a possible 53 days (206 hours), the days and hours being 33.9% and 76.7% above the 2010-2019 average.

Mount Lorette, Alberta

Weather

Table 6 summarizes the weather data from this season's count. The season saw one of the coldest and snowiest counts ever conducted at the site. Eight days, March 6, 7, 13, 14, 30, 31, April 3 and 15, were completely lost to adverse weather, when heavy snow fell and the ridges were completely obscured. A further 4 days, March 21, 24, April 1 and 11 experienced similar conditions and probably should also have been called as non-observation days. The 12 lost days are by far the highest ever and 285.7% above the spring average for the site. A total of 18 active days (40%) experienced snowfall (excluding days with occasional flurries) which is 24.2% above average, but because of lower than average temperatures rain fell on only 1 day which is 66.7% below average.

The highest maximum temperature was 13°C on April 21(12.7% below average) and the lowest maximum was -11°C on April 1; the highest minimum temperature

was 4°C on April 22 and the lowest minimum was -27°C on March 15. On 11 active days the temperature failed to rise above 0°C (40.8% above average). The average daily high temperature in March was 1.7°C and the average daily low was -7.9°C; the average daily high temperature in April was 3.5°C and the average low was -7.6°C.

Wind direction and velocity was 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 SSW-W 64.4% of the time (9.2% below average), from the N-E 15.5% (47.4% above average), SW-NW 11.1% (+532.3%), and from other directions and variable winds 9%.

Ridge wind speeds were assessed as strong to very strong (41 km/h to >100 km/h) 17.8 of the time which is 29.9% above average; they were moderate to strong (11 to 100 km/h) 37.8% of the time (29.7% above average), moderate (11-40 km/h) 11.1% of the time (39.5% below average), light to moderate (1-40 km/h) 22.2% of the time (-16%), light winds occurred 6.7% of the time (-15.3%) and variable 4.5% of the time (+80%).

Four days (8.9%) experienced cloud cover between 0% and 10% (113.6% above average), 5 days (11.1%) saw cloud cover between 80 and 100% (-40.5%) and a total of 28 days (62.2 %) experienced 100% cloud for at least part of the day (-4.7%). The eastern ridge system (Fisher Range and Mounts Lorette and McDougall) was at least 10% obscured on 20 active days (44.4%, 4.1% above average), and 40-100% obscured on 8 active days (17.7%, 28.5% below average). The western ridge system (Mounts Kidd, Bogart, Allan and Collembola) was at least partly obscured (10 %+) on 29 days (64.4%, +9.8%) and 40-100% obscured on 13 active days (28.9%, 13.7% below average).

In summary temperatures were low throughout and only approached normal for the last 4 days of the count. Eight complete days were lost to heavy snow and low clouds and 4 more experienced similar conditions. Snowfall on active days was well above normal, but the low temperatures only produced one day with rain. Ridge winds were predominantly favourable SSW-W as usual, but unfavourable N-E winds were above average. Moderate to very strong winds were the norm and light to moderate winds were significantly less frequent.

Cloud cover was fairly average except that there were more periods of cloudless skies than normal. Ridge occlusion was below average on the eastern route and slightly below average on the western route.

General flight dynamics March 1 to April 22

A total of 1856 migrant raptors of 14 species were counted on 43 of 45 active observation days between March 1 and April 22 (**Table 1**). The combined species total was 33.9% below the long-term average of all counts for the period March 1 to April 22 at the site (**Table 3A**), but 41.8% below average when the anomalously low counts are excluded (**Table 3B**). The total is the lowest ever spring count for valid counts at the site and is the first below 2000 birds. A total of 11 active days (24.4%) had counts of 10 birds or less. The first significant movement occurred on March 9 when 169 birds (164 Golden Eagles) were counted that proved to be the third highest count of the season. The highest combined-species count was 189 (168 Golden Eagles) on March 22 which is the lowest ever maximum count and 52.6% below average. Movement was fairly persistent throughout the count although it was regularly interrupted by periods of bad weather. The March combined-species count of 1279 included 1162 Golden Eagles, the totals being 49.0% and 50.7% below the average for valid March counts respectively and both being the lowest ever March counts (**Table 4B**). April produced 577 migrant raptors of which 367 were Golden Eagles, the totals being 15.7% and 28.6% below the average for valid April counts respectively (**Table 5B**). The March combined species total of 1279 represented 68.9% of the total spring 2018 count, and the April total of 577 represents 31.1% of the total count. Of the 18 species that have been recorded at the site during the period (**Table 3B**) 8 species occurred in above average numbers: Osprey 3 (+56.8%), Northern Harrier 6 (+29%), Sharp-shinned Hawk 25 (+4.9%), Cooper's Hawk 9 (+39.9%), Red-tailed Hawk 33 (+10.2%), Ferruginous Hawk 1 (+475%), American Kestrel 4 (+268%), Prairie Falcon 3 (+43.8%); and 6 occurred in below average numbers: Bald Eagle 167 (-53%), Northern Goshawk 22 (-1.9%), Rough-legged Hawk 9 (-53%), Golden Eagle 1529 (-24.8%), Merlin 5 (-24.8%) and Gyrfalcon 1 (-34.3%). Four species, Turkey Vulture, Broad-winged Hawk, Swainson's Hawk and Peregrine Falcon were not recorded this season.

The final count was Turkey Vulture 0, Osprey 3, Bald Eagle 167, Northern Harrier 6, Sharp-shinned Hawk 25, Cooper's Hawk 9, Northern Goshawk 22, *Accipiter* sp. 7, Broad-winged Hawk 0, Swainson's Hawk 0, Red-tailed Hawk 33, Ferruginous Hawk 1, Rough-legged Hawk 9, *Buteo* sp. 7, Golden Eagle 1529, eagle sp. 17, American Kestrel 4, Merlin 5, Gyrfalcon 1, Peregrine Falcon 0, Prairie Falcon 3, *Falco* sp. 2 and indeterminate raptor 6, for a total of 1856 migrant raptors of 14 species.

The combined species median passage date was March 23, coincident with the long-term average and reflecting the numerical dominance of Golden Eagles in the count. Six species occurring in sufficient numbers to calculate median passage dates were later than average: Bald Eagle 8 days, Sharp-shinned Hawk 1 day,

Cooper's Hawk 6 days, Northern Goshawk 9 days, Rough-legged Hawk 9 days and Merlin 12 days; Northern Harrier was coincident with average and Red-tailed Hawk and Golden Eagle were 1 day earlier than average. **(Table 11)**.

Detailed daily summaries of weather and flight dynamics can be found on the spring 2020 blog on the RMERF website www.eaglewatch.ca

Golden Eagle

Observers counted a total of 1521 migrating Golden Eagles on 40 days between March 1 and April 22, with the highest single-day count of 173 occurring on March 16 (**Figure 1**). The number of days on which the species was recorded is 10.5% below average, the total is 46.8% below the long-term average and is the lowest ever for a valid count at the site, and the high count is 55.4% below average which is lowest maximum count ever for a valid count ahead of 252 in 2006. Only 4 other days had three-figure counts: March 09 (164), March 18 (113), March 22 (168), March 25 (144).

The March count of 1162 was 46.7% below the average of all counts at the site (**Table 4A**), but when the anomalously low counts are excluded the figure falls to -50.7%, and the count is the lowest ever March total for the site (**Table 4B**). The April count of 367 is 28.6% below average excluding the anomalously low counts (**Table 5B**). The flight comprised 939 adults, 102 subadults, 83 juveniles, 8 undifferentiated immature birds and 397 birds of unknown age yielding an immature:adult ratio of 0.31 which is 113.9% above the long-term average ratio.

The median passage date for the species was March 22 which is 1 day earlier than average. Adult birds were 2 days earlier than average on March 20 and immature birds were 3 days later than average on April 9.

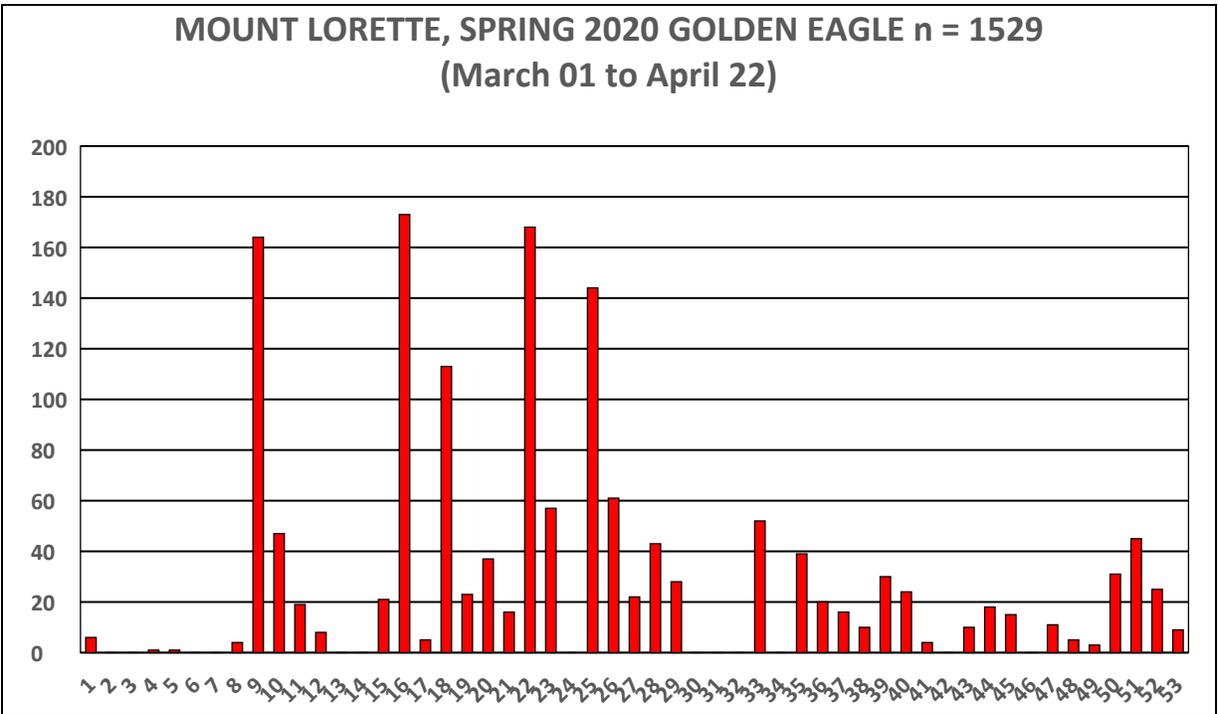


Figure 1

The pattern of the hourly cumulative counts (**Table 7, Figure 2A**) is very unusual in that it approximates an almost normal, although truncated, distribution curve centred on 1300-1400 compared to the long-term average (1993-2007) negatively-skewed normal distribution curve where hourly counts steadily increase throughout the day, peak around 1600 and fall thereafter (**Figure 2B**). This season's chart shows a steady build-up to a relatively low peak of 213 at 1300-1400 followed by a stepped decline to 1800-1900 after which only 7 birds were observed. Only 4 birds moved before 0800. The highest single-hour count was a low 51 between 1300 and 1400 on March 9 and only 5 other hours produced between 31 and 39 birds. There were no double-digit hourly counts at the site after April 2.

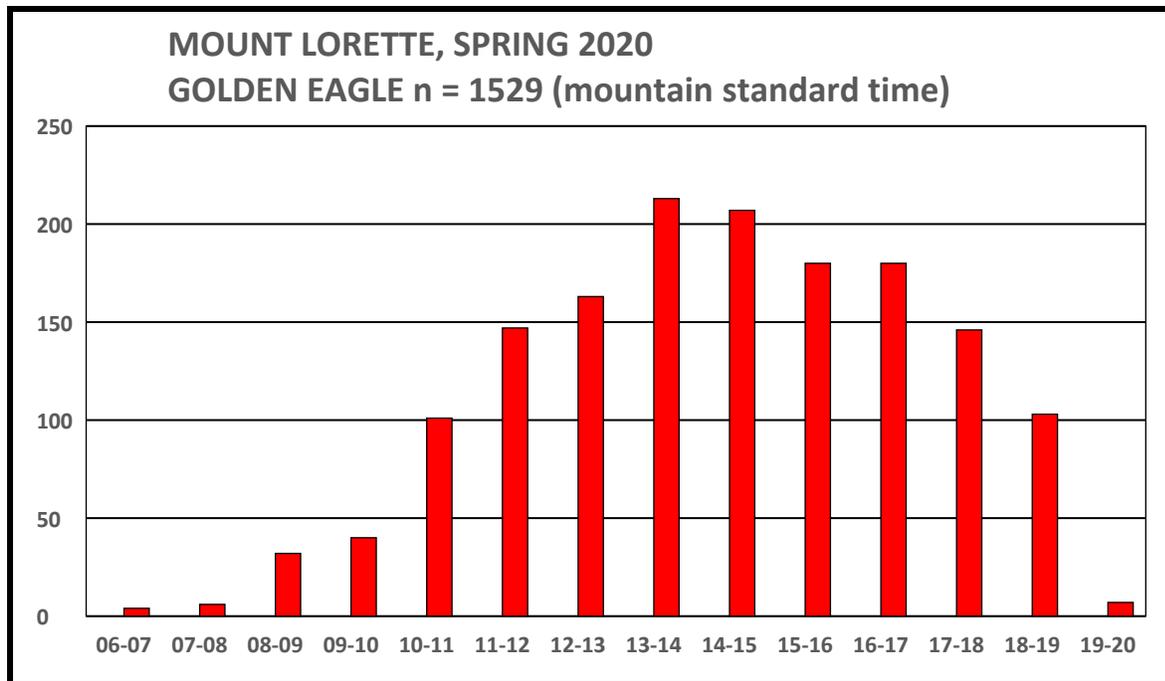


Figure 2A

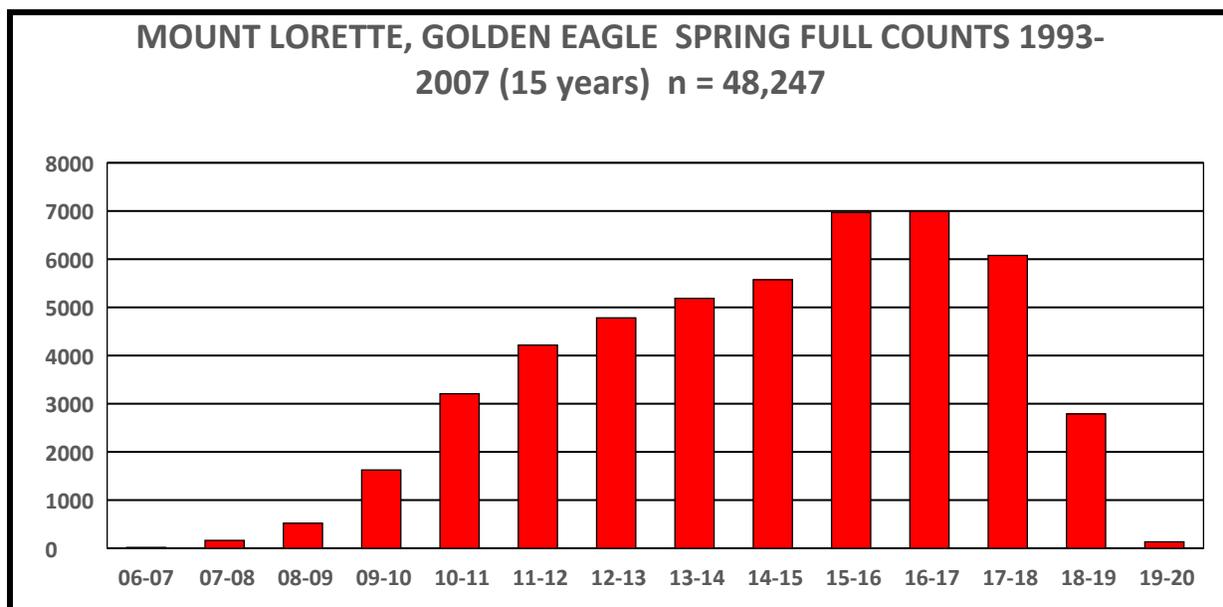


Figure 2B

Spring Golden Eagle Trend

Figure 3A shows the trend of all Golden Eagle counts at the Mount Lorette site since 1993 for the period March 1 to April 22. As this period normally captures about 97% of the total Golden Eagle movement it is essentially identical to the trend derived from using data from complete counts. For reasons discussed in the Introduction, the years 2008, 2009, 2010 and 2012 that yielded anomalously very low counts have been omitted on **Figure 3B**.

The weather at the site for these counts was generally worse than average and birds may have been deflected to more easterly routes in greater numbers than usual, but the weather in 2011 was similar, as was the weather in 1997 and 1999 and all of these counts (2982, 2352 and 2565 respectively) were significantly higher than those of the period 2008-10. The linear trend line (**Figure 3A**) appears to show an overall decline and removal of the anomalous low counts (**Figure 3B**) only slightly tempers but does not change this overall trend, neither does the removal of the demonstrably weather-affected counts in 1997 and 1999. When data from the 2008-2010 spring counts at the Piitaistakis-South Livingstone site are substituted they fall comfortably on the trend line (**Figure 3C**) and also clearly show the anomalous nature of the contemporary counts at Mount Lorette. The removal of the remaining anomalous count in 2012 does not materially affect the trend, and it is unfortunate that no count was conducted at Piitaistakis-South Livingstone in spring 2012.

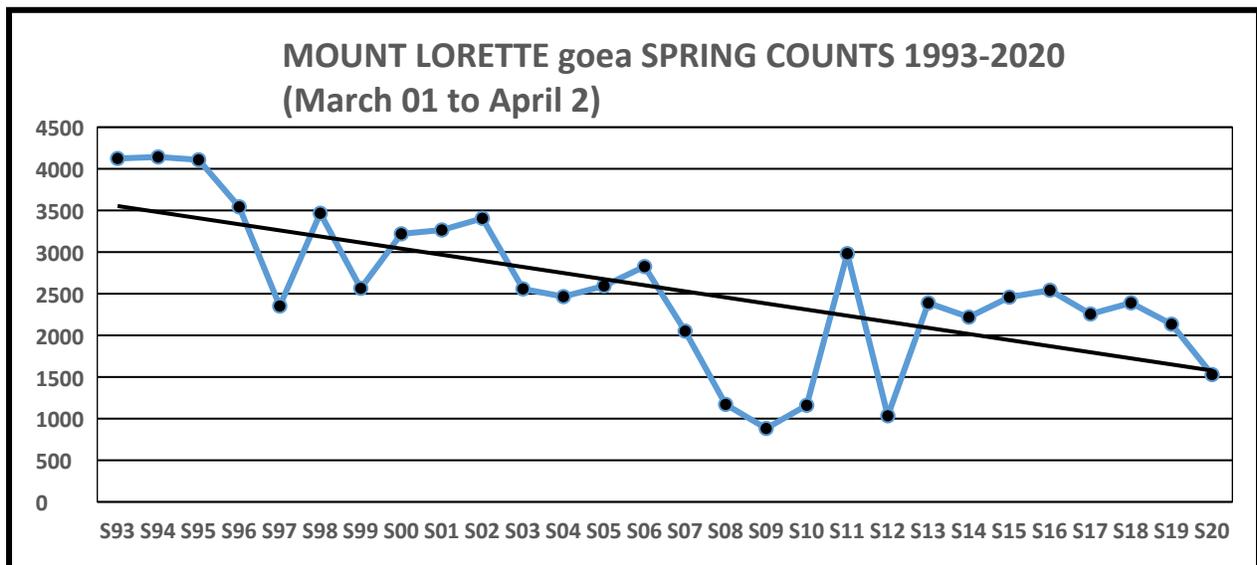


Figure 3A

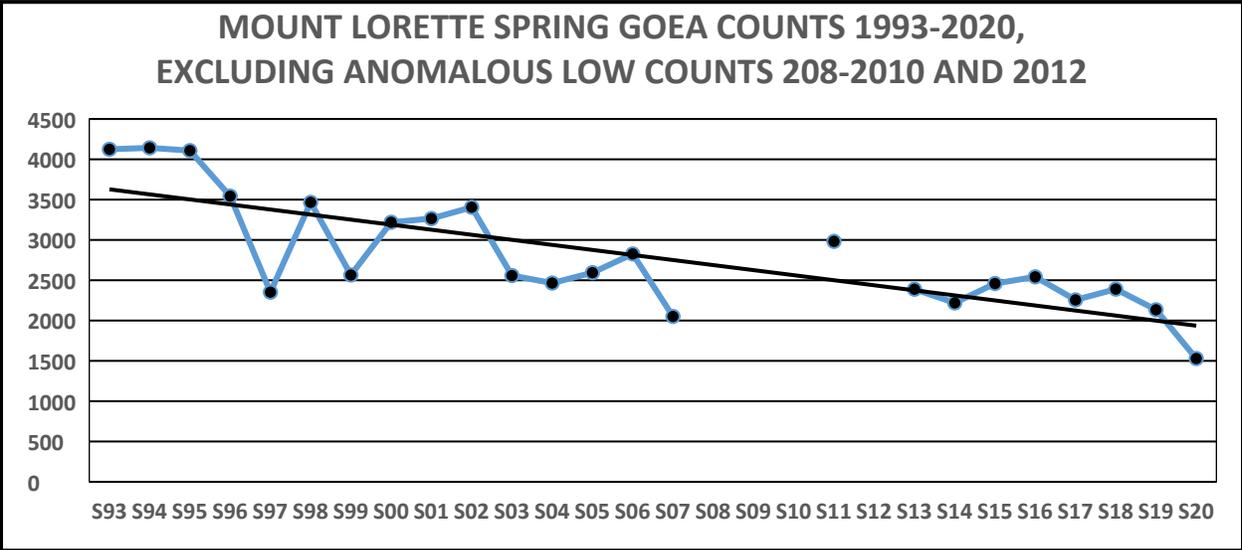


Figure 3B

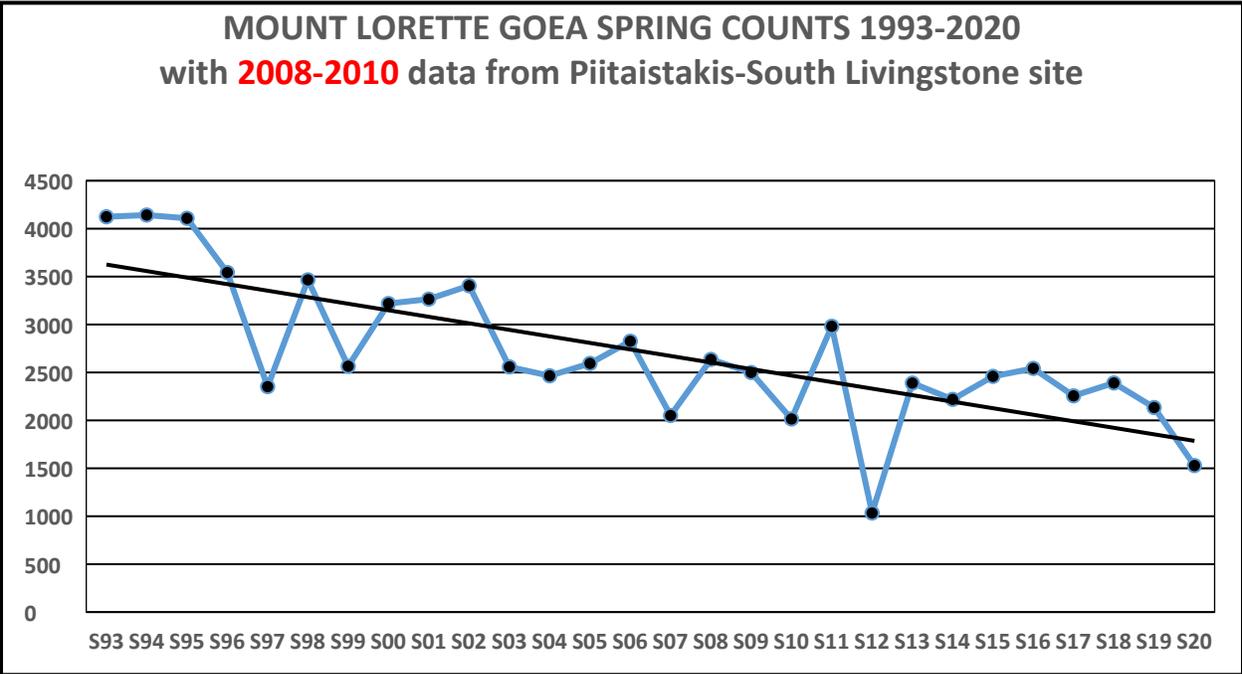


Figure 3C

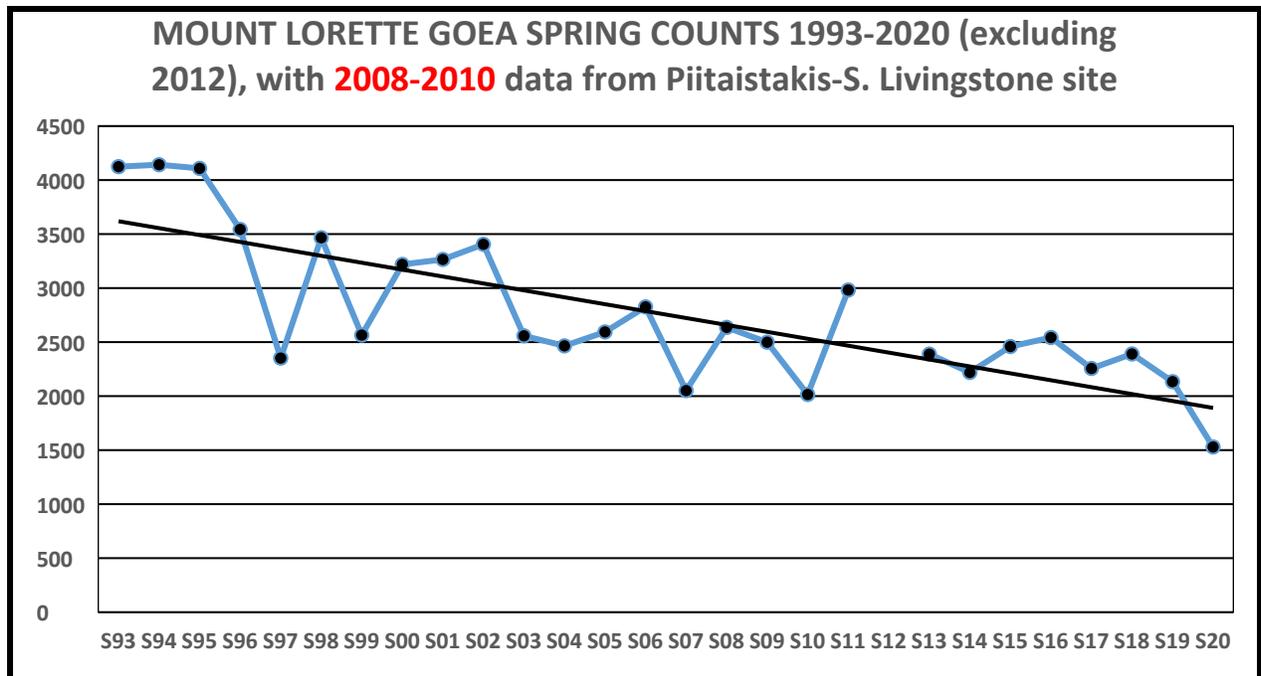


Figure 3D

Most of the decline appears to have taken place between 1995 and 2003⁶ (**Figure 3E**); subsequently the trend is almost horizontal suggesting that the population has remained essentially stable over this 17-year period (**Figure 3F**). This figure uses data from the 2008-10 counts at Piitaistakis-South Livingstone, and omits the remaining Mount Lorette anomalous 2012 low count. The spring 2020 count now produces a slight linear declining trend for this period. Adding the 177 Golden Eagles seen at Beaver Mines but not recorded at Mount Lorette between March 25 and April 22 (see later section on comparison of Golden Eagle counts at the three sites) gives a possible total of 1706 at Mount Lorette which only very slightly ameliorates this declining trend (**Figure 3G**).

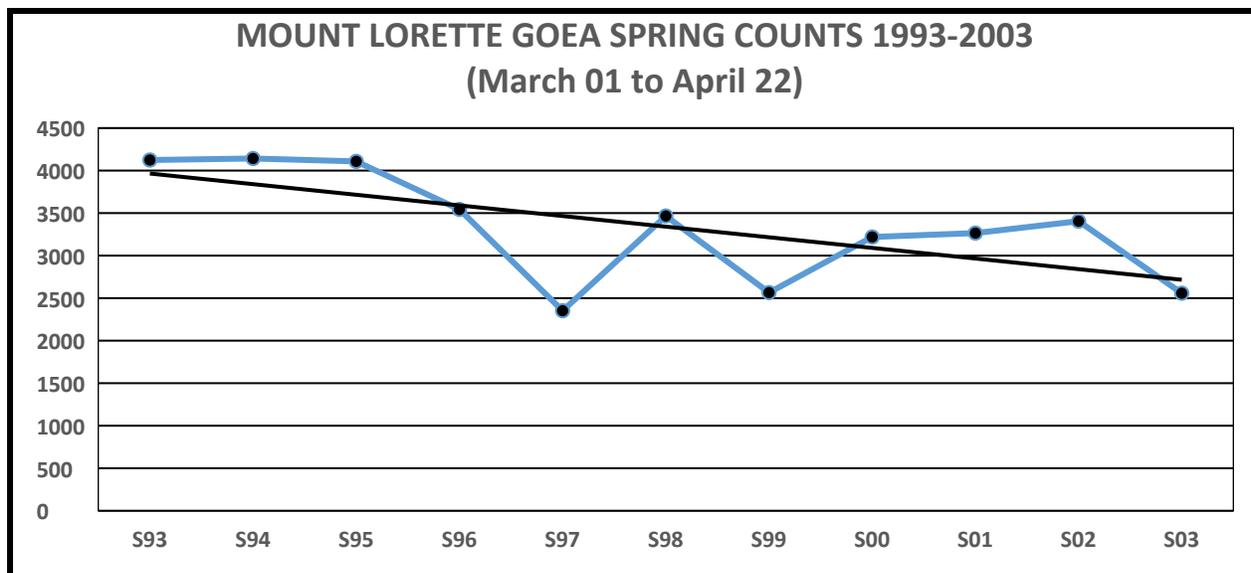


Figure 3E

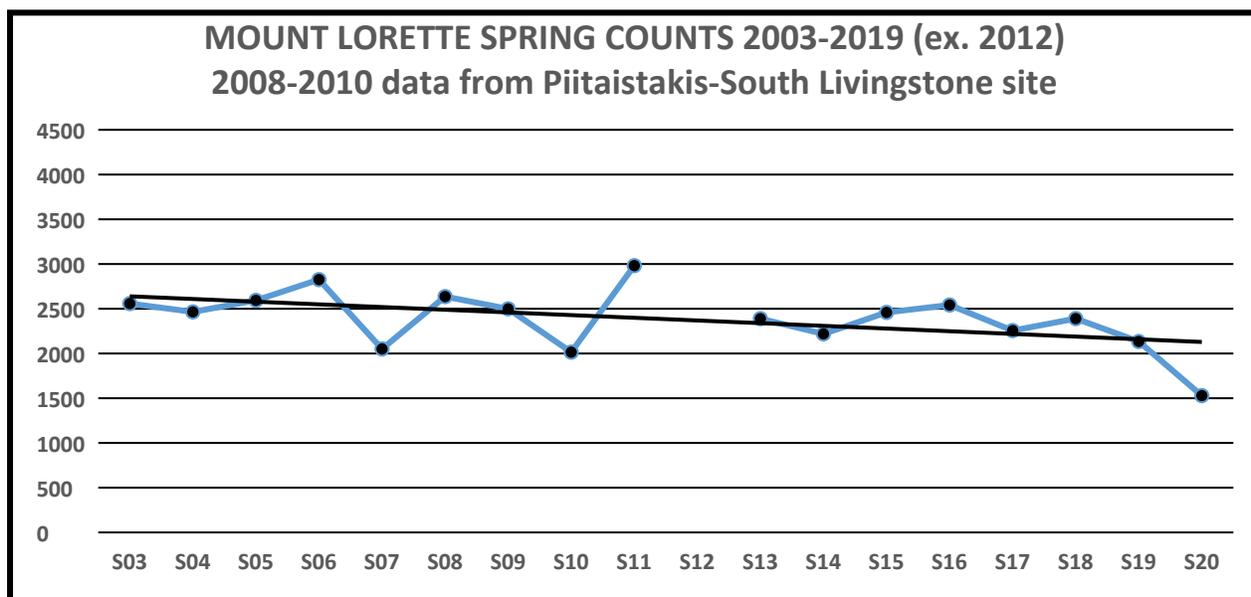


Figure 3F

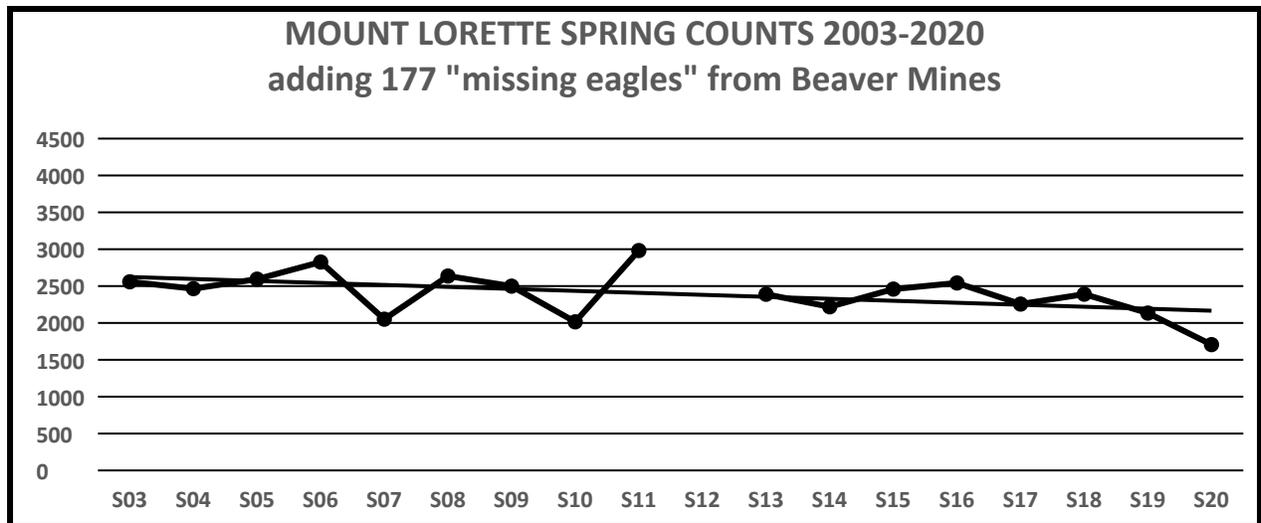


Figure 3G

Golden Eagle Age Analysis

Figure 4 shows the ratio of immature and adult Golden Eagles from 1994 to 2020. This is based on a combination of Mount Lorette and Piitaistakis-South Livingstone data as contemporaneous counts from both sites show a close correlation of ratios. The upper (blue) series show fall data, the lower (orange) series show spring data. The fall data points are plotted above the spring data points of the following year. Both data sets generally show a remarkable parallelism, with the spring data consistently showing a significant reduction from the previous fall. This probably reflects a combination of winter mortality and possibly a more diffuse migration pattern of young birds in the spring. It is also accentuated by the current shorter count period which will miss juvenile birds that move after April 22. Despite these limitations the trends are consistent and almost certainly reflect the breeding cycles of the northern Snowshoe Hare population ^(1, 2, 3, and 5). This probably peaked around the time counts started at Mount Lorette in 1992, (although age data from the first two years are not reliable enough to be included) and fell to 1995 rising again to a second peak around 1999/2000, that then fell to 2002 before steadily rising to the next peak in 2007. The current cycle probably peaked in the summer of 2017 which is reflected in the highest ever spring ratio of 0.25 recorded in the spring 2018 count. This would indicate that three eight to ten-year cycles have occurred during the life of the project so far.

The spring 2020 ratio of 0.21 is anomalous in that it does not reflect the decline in the ratio observed in the fall 2019 count. The ratio for the same count period at Beaver Mines was a similar 0.18

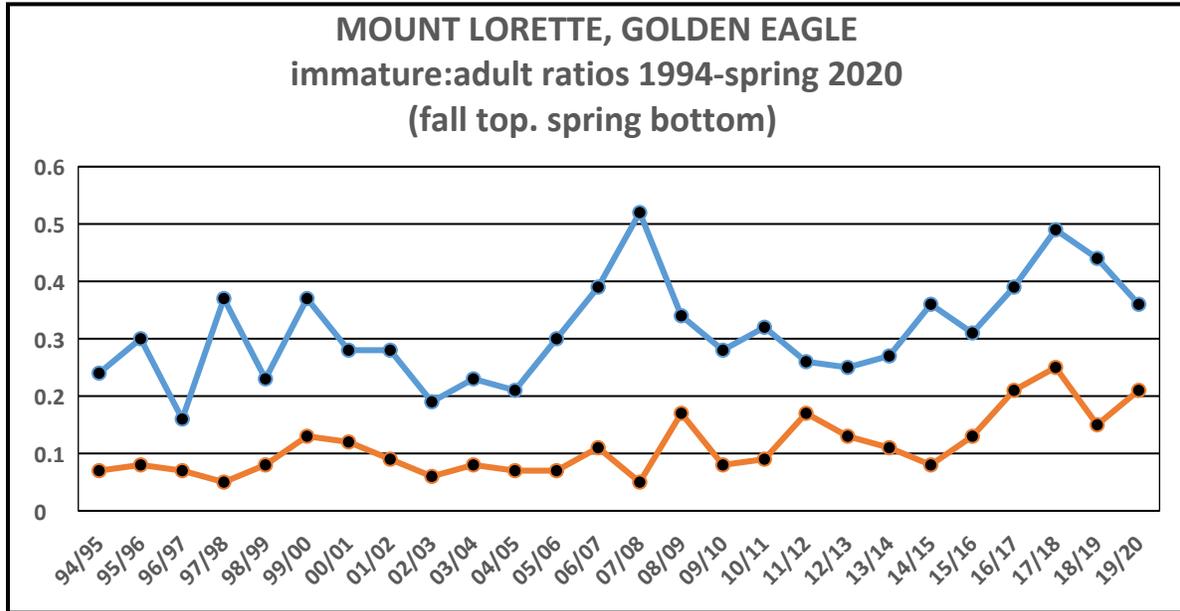


Figure 4

Bald Eagle

A total of 167 birds were counted on 37 days between March 1 and April 22 with a high single-day count of only 14 on March 28 (**Figure 5**). The count is 9.1% below the long-term average, the number of occurrence days is close to average (-1.8%), and the high count is 35.3% below average and equals the second lowest ever ahead the 13 counted on March 25 2004. The March count of 75 was 33.0% below average and is the third lowest March count ever (**Table 4B**), but the April count of 92 was 28.3% above average and is the highest since 2003 (**Table 5B**). The flight comprised 97 adults, 39 subadults, 17 juveniles, 8 undifferentiated immature birds and 6 birds of indeterminate age giving an overall immature:adult ratio of 0.66 which is an anomalous 92.3% above the long-term average ratio and is by far the highest ever seen at the site. By contrast the ratio of juvenile birds to adults and subadults was a relatively low 0.19. The immature adult ratio at Beaver Mines for the same period was 0.34. There appears to be an identification problem here and the Lorette numbers need to be treated with caution.

The median passage date for the species was April 6, 8 days later than average and the latest species median passage date recorded at the site; adult birds were 1 day later than average on March 27 and immature birds were also 8 days later than average on April 8 and is one day earlier than the latest ever immature median date.

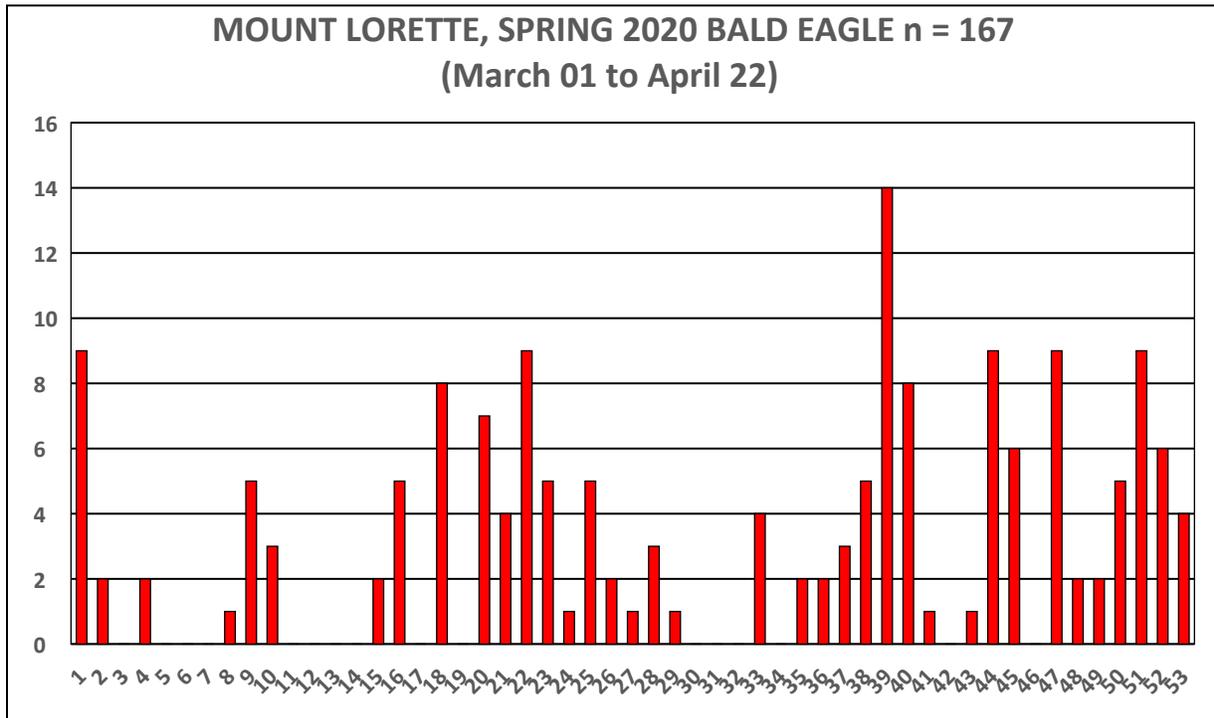


Figure 5

Other species

Turkey Vulture Not recorded this season. Previous records for the count period were single birds recorded on April 13, 1993, March 18, 2011, March 31 2013, April 6 2019 and 2 birds seen on April 10 2016.

Osprey

Single birds were recorded on April 16, 17 and 20. The total is 56.8% above average and the first arrival date was 1 day later than average.

Northern Harrier

A total of 6 single harriers was recorded on 6 days between March 12 and April 21. The total and number of days seen are 29% and 59.6% above average respectively and the first bird was 22 days earlier than the average first occurrence date and was the second earliest record ever. The flight comprised 1 adult male, 2 adult females, 2 undifferentiated female/juveniles and 2 indeterminate birds. The species median passage date was April 13 coincident with the average date.

Sharp-shinned Hawk

A total of 25 birds were seen on 13 days between March 23 (4 days earlier than average) and April 22. The total and sighting days are 4.9% and 7.6% above average respectively. The highest single-day counts were 4 on April 13 and 19, totals that are 25.2% below average. Three birds were counted in March which is 15 % above average (**Table 4B**), and 22 in April which is 3.7% above average and is the highest April count since 2011 (**Table 5B**). The flight comprised 6 adults and 19 undifferentiated birds. The species median passage date of April 14 is 1 day later than average and the adult median passage date of April 16 is 2 days later than average.

Cooper's Hawk

A total of 9 birds were counted on 5 days between April 2 (7 days later than average) and April 20 with a high count of 5 on April 20. The count, days and maximum are 39.9%, 6.5% and 134.7% above average respectively. The flight comprised 4 adults and 5 birds of undetermined age. The median passage date for the species was April 20, 6 days later than average and for adults April 13 which is average.

Northern Goshawk

The total of 22 birds seen on 15 days between March 3 (9 days earlier than average) and April 21 was close to average (-1.9%), and the occurrence days were 7.5% above average. The highest daily count was 5 birds on April 13 which is 7.5% higher than the average high single-day count. Six birds moved in March (-45.2%) and 16 in April (+39.4%) which is the highest April count since 2005(**Tables 4B and 5B**). The count comprised 14 adults, 3 juveniles and 5 indeterminate birds that gives an immature:adult ratio of 0.2, 34.9% above average.

The median passage date for the species and for adults was April 8, which is 9 and 11 days later than average respectively.

Broad-winged Hawk

Not recorded this season. The species has been recorded on 5 previous counts including 3 of the last 5 years.

Swainson's Hawk

Not recorded this season. The only previous record for the count period was two adult birds (1 light morph and 1 rufous morph) seen on April 19 2017

Red-tailed Hawk

A total of 33 birds were counted on 16 days between March 19 (2 days earlier than average) and April 20, with a high single-day count of 5 birds on April 16. The count and number of days are 10.2% and 11.2% above average respectively but the high-count is 12.9% below average. Six birds were seen in March (29% above average) and 27 in April (6.7% above average) (**Tables 4B and 5B**). The flight comprised 28 "Western Red-tailed Hawks" (*B.j.calurus*): 24 adults (13 light, 5 rufous (intermediate) and 5 dark morphs) and 1 light morph juvenile; 2 adult "Eastern Red-tailed Hawks" (*B.j.borealis*); 2 adult "Harlan's Hawks" (*B.j.harlani*) (1 dark and 1 intermediate) and 1 bird of undetermined race, morph or age. The overall immature:adult ratio was 0.03, 47.3% below average. The median passage date of the species and for adult birds was April 9, 1 day earlier than and coincident with the average passage date respectively.

Ferruginous Hawk

A single dark morph adult bird recorded on April 22, the last day of the count, was only the 5th spring record for the site. Previous records for the period are 1 on April 9 1994, single birds on April 6 and 7 1995, and 1 on April 15 2001.

Rough-legged Hawk

A total of 9 birds counted on 6 days between March 22 (3 days later than average) and April 19 equals the third lowest spring count ever at the site. The count and number of days seen are 53% and 39.2% lower than average. The highest single-day count was 3 on April 18, which is 46.5% below the average high count. Just 1

bird moved in March (-80.8%) and 8 in April (-42%) (**Tables 4B and 5B**). The median passage date of April 16 was 9 days later than average. The flight comprised 6 light morphs, 2 dark morphs and 1 bird of indeterminate morph giving a dark:light ratio of 0.33.

American Kestrel

Four single birds of indeterminate sex recorded on 3 days between March 22 and April 19 equals the second highest spring count at the site behind the 5 seen in 2000.

Merlin

Five birds were recorded on 4 days between April 4 (14 days later than the average first occurrence) and April 20 when 2 birds were seen. The total is 24.8% below average, the number of count days is 30.8% below average, but the high count is 15% above average. The count comprised 1 adult, 1 female/juvenile and 1 indeterminate bird of the race *F.c. columbarius*; 1 female/juvenile of the race *F.c richardsonii*, and 1 bird of undetermined race, sex or age. The species median passage date of April 17 is 12 days later than average.

Gyr Falcon

A single bird of undetermined morph, sex or age was seen on April 9, 17 days later than the average first occurrence of the species. The total is 34.3% below average.

Peregrine Falcon

Not recorded this season but has occurred on 15 previous counts.

Prairie Falcon

Single birds were seen on 3 days between March 26 (1 day earlier than average) and April 20: the total is 43.8% above average.

Observers

Principal Observers: Blake Weis (13 days), Lori Anderson (9 days). Caroline Lambert (8 days), George Halmazna (6 days), Graeme Dunlop (4 days), Bill

Wilson (3 days), Joel Duncan (2 days), Dan Parliament (2 days), Arnie and Elly Weisbrot (2 days), Cliff Hansen (1 day), Rick Robb (1 day).

Assistants: Joseph Walters (10 days), Dan Parliament (6 days), Rick Robb (6 days), Glen Webber (6 days), Patrick Farley (4 days), Blake Weis (4 days), Joel Duncan (2 days), Cliff Hansen (2 days), Heinz Unger (2 days), Karen Anderson (1 day), Caroline Lambert (1 day).

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Beaver Mines, Alberta

Introduction

Beaver Mines is a small hamlet located about 20 km west of the town of Pincher Creek in southwestern Alberta. It is also where I have lived since 2007 after moving there in order to conduct counts at the Piitaistakis-South Livingstone site. My house is located in a valley on the alignment of the most easterly foothills ridge system that has a NW-SE orientation in this area. In the past I commented in the daily blog on individual days when I observed significant raptor movement from my house in both spring and fall at times when the mountain and foothill ridges to the west are obscured by cloud. During the spring of 2014 these conditions appeared to have prevailed for extended periods so I was able to conduct non-systematic counts on 17 days (78.1 hours) between March 18 and April 17. The count yielded a total of 1092 migrants of 10 species including 110 Bald Eagles and 853 Golden Eagles. In the spring of 2015 I spent a total of 39 days (209 hours) observing from my house and recorded a total of 1798 migrant raptors of 17 species. On only 2 active observation days were no migrants seen, and it appeared that this route is an important spring raptor flyway and not just a poor weather displacement route from the west as I had previously believed. The highest single day count was 463 (including 429 Golden Eagles) on March 19, one day earlier than the maximum movement at Mount Lorette. In 2016 I conducted a first full count of 52 days (401.3 hours) between March 1 and April 22 exclusively from my house in Beaver Mines and the count produced a total of 2038 migrant raptors of

17 species. Spring 2017 was the second consecutive full count conducted from my house on 56 days (510.1 hours) between February 25 and April 22. Because of its more southerly location about 200 km south of Mount Lorette I decided to start the count in late February to see if there was any early raptor movement and the last 4 days of February yielded 24 migrants of which 20 were Golden Eagles. A total of 1992 migrants of 18 species were counted, a total that was 3.9% higher than the average of the last 2 years. As with the previous three years the count notably differed from that at Mount Lorette in the variety and numbers of non-eagle species (16 species) which comprised 31.1% (compared to 39% in 2016) of the total count at Beaver Mines and compared to 7.5% (14 species) at Mount Lorette. The 2018 count set a new high combined-species record of 2340 migrants of 18 species including record counts of Bald Eagles (355) and Golden Eagles (1533). The 2019 count produced a disappointing count of 1216 birds of 18 species that included only 642 Golden Eagles, but was somewhat redeemed by a last-day (April 22) count of 79 raptors of a record 16 species. (**Table 10**).

Spring 2020 is the sixth consecutive complete count at the site. Because of the need to isolate during the initial wave of the COVID-19 pandemic we decided to extend the count from February 23 to May 3 to get a fuller picture of the spring migration dynamic in the area. The count comprised 69 of a possible 71 days (877.7 hours), the days and hours being 36.4% and 88.1% above the 2015-2019 average respectively.

Weather and General flight dynamics February 23-May 3

The weather is summarized in **Table 9**, and the migration dynamic is illustrated in **Figure 6**. February 24 saw no migrants on a cold and snowy day, but the next 6 days had a steady migration of 124 birds of 4 species: 47 Bald Eagles, 4 Northern Goshawks, 21 Rough-legged Hawks and 52 Golden Eagles. The February daily temperature high averaged 3.4°C (range -2.5°C to 10°C) and the average low was -0.9°C (range -7°C to 3.5°C), winds were moderate to strong W-WSW and, apart from February 24 the ridges were completely clear. March had 10 days with significant snowfall (March 4, 7, 8, 11, 13, 14, 19, 24, 30 and 31) that periodically obscured the ridges but only on the 13th and 14th was observation not possible.

March was cold to cool throughout with the daily temperature high averaging only 1°C (range -19°C to 9.5°C) and the average low was -6.1°C (range -23°C to 6°C). Winds were WSW-SW on 15 days in March, had a NNE-SSE component on 14 days and were variable on 2 days. Snow and periods of snow fell on 12 days of the month, which often obscured the ridge, and the only rain was light drizzle on the

23rd. Unsurprisingly migration was sporadic throughout the month but significant movements were 85 (68 Golden Eagles) on March 9, 92 (76 Golden Eagles) on March 12, 104 (63 Golden Eagles) on March 22 and a concerted movement of 4 days between March 26 and 29 when 603 (472 Golden Eagles) moved. The 262 migrants (213 Golden Eagles) on March 28 was the highest daily count of the season. It is interesting that the peak raptor movement at the Steeples site on the west flank of the Rockies was 274 birds on 7 days between March 15 and March 21 that included 202 Golden Eagles, which contrasted with a 6 day count of only 25 migrants (22 Golden Eagles) at Beaver Mines between March 13 and 18. This is similar to the possible westwards displacement of migrants between the two sites described in the spring 2019 report. The final March count was 1150 raptors (4.8% below the 2015-2019 average) of 13 species that included 177 Bald Eagles (+5%) and 843 Golden Eagles (-1.4%).

Cool weather persisted into early April with the last below-freezing daytime high temperature on April 12 and the last below-freezing starting temperature on April 16. The daily temperature high for the month averaged 7.4°C (range -12°C to 20°C that was the seasons' high temperature on April 29) and the average low was -1°C (range -16°C to 12°C). Snow fell on 10 days to April 18 and often obscured the ridges, and up to April 18 winds were mainly moderate, dominantly NNE-ENE on 11 days that produced 136 migrant raptors and WSW-SW on 7 days that produced 461 raptors that included 122 on April 6 and 104 on April 9. From April 19 to April 30 winds were almost exclusively moderate to strong W-WSW with light rain or showers falling on 3 days during the period. These conditions produced a steady stream of migrants, with 435 birds moving at an average of 36.25/day. These conditions persisted into the first 3 days of May which produced another 42 migrants, but only 7 on May 3, the last day of the count (**Figure 6**).

The additional 11 days (April 23-May 3) (161.5 hours) at Beaver Mines produced 322 migrants comprising 16 Turkey Vultures, 14 Ospreys, 39 Bald Eagles, 10 Northern Harriers, 62 Sharp-shinned Hawks, 16 Cooper's Hawks, 9 Northern Goshawks, 15 Broad-winged Hawks, 6 Swainson's Hawks, 20 Red-tailed Hawks, 0 Ferruginous Hawks, 3 Rough-legged Hawks, 1 unidentified *Buteo*, 76 Golden Eagles, 12 American Kestrels, 12 Merlins, 1 Gyrfalcon, 10 Peregrine Falcons and 3 Prairie Falcons.

The final count (**Tables 8 and 10**) (with variance compared to the average of 2015-2019 in parenthesis and new high counts for the site in bold) was **2348**

migrant raptors (+25.1%) of 18 species that comprised **16 Turkey Vultures** (+380%), **18 Ospreys** (+462.5%), **389 Bald Eagles** (+44.6%), 45 Northern Harriers (-5.9%), **141 Sharp-shinned Hawks** +118.9%), 30 Cooper’s Hawks (+150%), 52 Northern Goshawks (+5.3.3%), 1 *Accipiter* sp. (-28.6%), **23 Broad-winged Hawks** (+167.4%), **9 Swainson’s Hawks** (+221.4%), 278 Red-tailed Hawks (+46.2%), 4 Ferruginous Hawks (-25.9%), 65 Rough-legged Hawks (-18.3%), 9 *Buteo* sp. (-31.8%), 1181 Golden Eagles (+9.8%), 0 eagle sp. (-100%), **22 American Kestrels** (+120%), **34 Merlins** (+120.8%), 5 Gyrfalcon (-16.7%), **17 Peregrine Falcons** (+112.5%), 9 Prairie Falcons (+25%), 0 *Falco* sp. (-100%) and 0 unidentified raptor (-100%).

The count normalized to the count period March 1 to April 22 is 1952 migrants of 18 species comprising 3 Turkey Vultures, 6 Ospreys, 304 Bald Eagles, 37 Northern Harriers, 93 Sharp-shinned Hawks, 17 Cooper’s Hawks, 43 Northern Goshawks, 1 *Accipiter* sp., 13 Broad-winged Hawks, 4 Swainson’s Hawks, 260 Red-tailed Hawks, 4 Ferruginous Hawks, 41 Rough-legged Hawks, 9 *Buteo* sp., 1061 Golden Eagles, 0 eagle sp., American Kestrel 12, Merlin 24, Gyrfalcon 4, Peregrine Falcon 10, Prairie Falcon 6, 0 *Falco* sp., 0 indeterminate raptors.

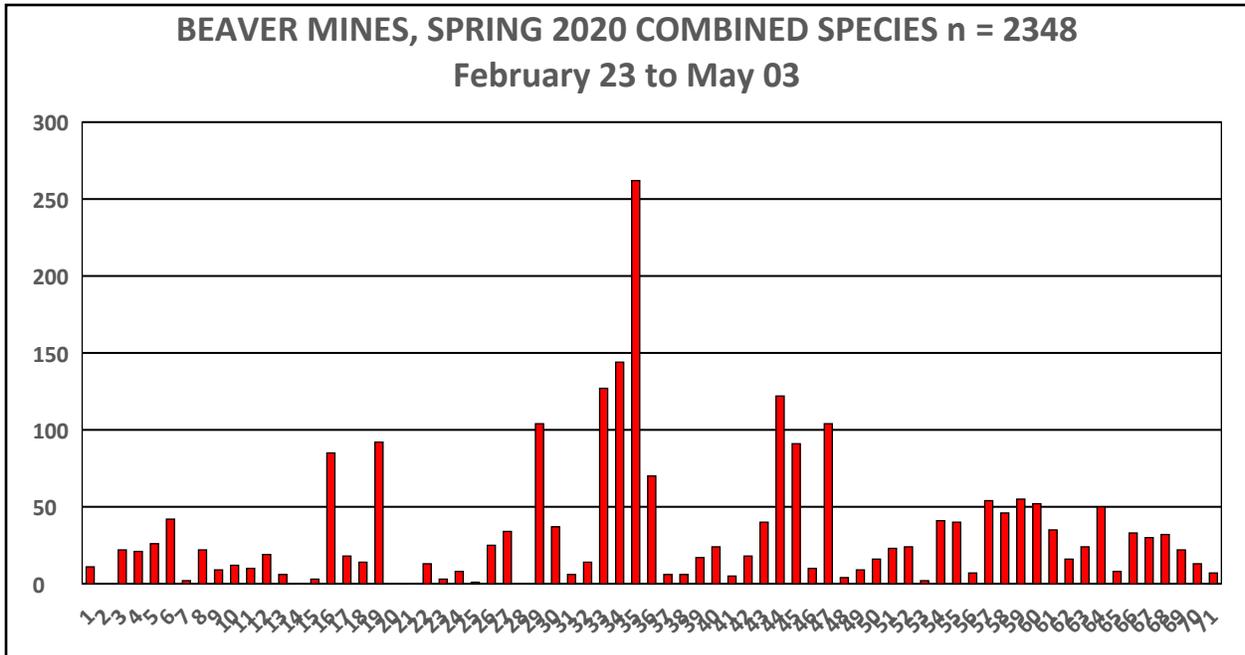


Figure 6

The combined species median passage date at Beaver Mines was March 28 for both count periods and at Mount Lorette was March 23. **Table 11** compares the median passage dates of individual species at Beaver Mines and Mount Lorette.

Golden Eagle A total of 1172 birds were counted on 65 days (50% above average) between February 23 and May 2, which, despite the longer count period, is only the second highest count at the site and is only 8.4% above the 2015-2019 average. The February count was a record 53 birds (+252%), the March count was 843 (-14%), 277 moved in April (+29.7%) and 9 birds moved between May 1 and 3. The highest single-day count was 231 on March 28 which is a new high count for the spring count and 57.7% above average: the highest single-day count at Mount Lorette was 173 on March 16. The flight comprised 924 adults, 70 subadults, 154 juveniles and 33 unaged birds, giving an immature:adult ratio of 0.24 which is comparable to the 0.21 recorded at Mount Lorette. The February count of 52 was a new monthly record and 215.2% above average; the March count was 843, 1.4% below the average of the last 4 years, and the April count of 277 was 29.7% above the average of the last 4 years.

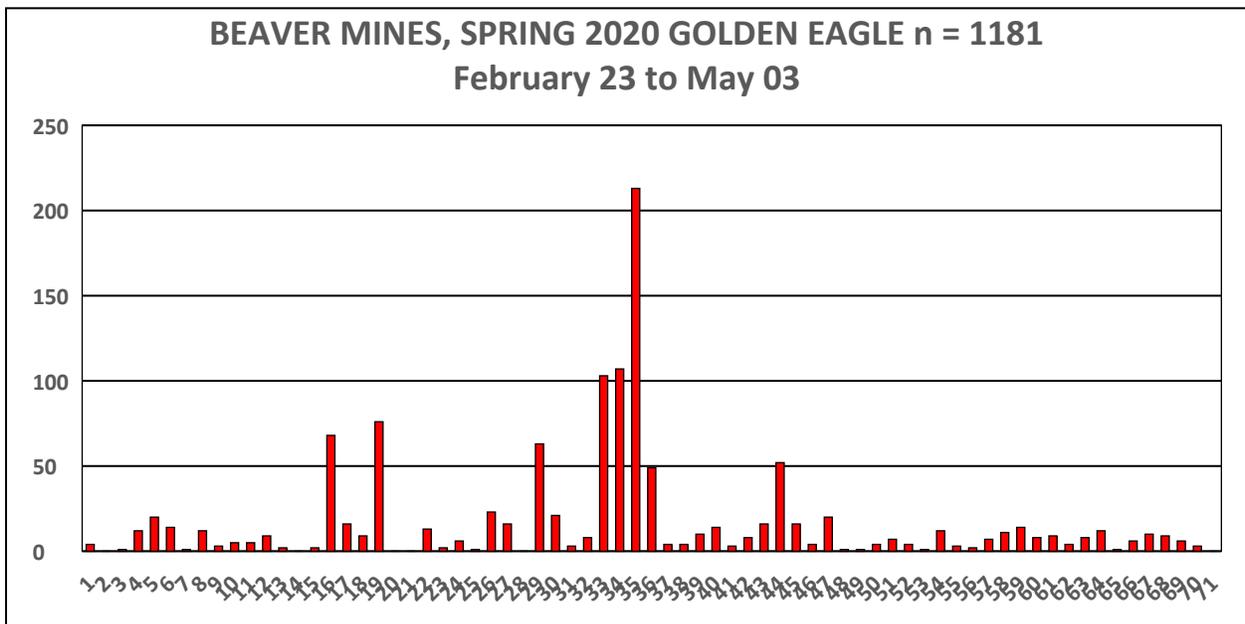


Figure 7

Bald Eagle (Figure 8) The Bald Eagle count of 389 on 51 days between February 23 and May 3 was a new high spring count for the site and 32% above the 2015-2019 average. The March 1 to April 22 count was 304 that was 3.2% above average. The February count of 47 was 487.5% above average, the March count of 177 was 5% above average, the April count of 153 was 57.4% above average. Surprisingly the single-day high count was only 27 on March 28, and was 47% below average but 5 other days had counts exceeding 20 birds (**Figure 8**). The flight comprised 292 adults (75.1%), 31 subadults (8%), 64 juveniles (16.5%) and 2 indeterminate birds that gives an immature: adult ratio of 0.33 that is 15.1% above average. Interestingly the ratio from the March 1 to April 22 count period is almost identical at 0.34. The ratio at Mount Lorette, however, was almost twice as high at 0.65 where the age breakdown of 167 birds was 97 adults (58.1%), 39 subadults (23.4%), 17 juveniles (10.2%), 8 undifferentiated immature birds (4.8%) and 6 indeterminate birds. The median Passage dates for the species, adults and immature birds were March 28, March 28 and April 5 that are 2 days, 4 days and 5 days later than average respectively. The comparative dates from the shorter count were March 28, March 28 and March 29. The dates at Mount Lorette were April 6 for the species, March 27 for adults and April 8 for immatures.

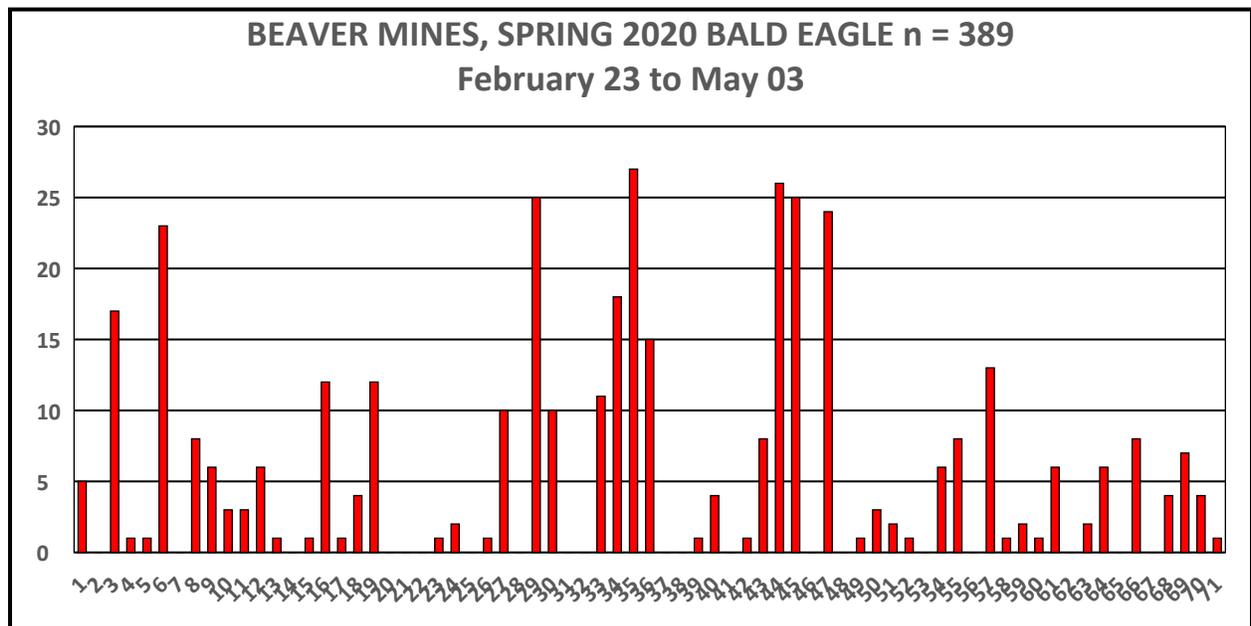


Figure 8

Turkey Vulture A site record 16 birds were counted on 10 days between April 7 and May 2. The total is 433.3% above the 2016-2019 average. The flight comprised 15 adult birds and 1 bird of undetermined age, and the median passage date was April 25. The highest single day count was 4 on April 25. Fourteen birds moved in April and 2 in May, and 3 occurred to April 22.

Osprey A site record of 18 Ospreys were counted on 7 days between April 17, 5 days later than the average first occurrence, and May 1. The total and number of days seen are 260% and 75% above average respectively. The highest single day count was 6 on April 30 which is 350% above average and is a new site spring record. Seventeen birds moved in April and 1 in May, and 6 were seen to April 22.

Northern Harrier A total of 45 migrants were counted on 20 days between March 5 (18 days earlier than average) and May 3. The total is 154.8% above average and the number of days seen was 88.7% above average. The highest daily count was 6 birds on April 6, 25% below average. Five birds moved in March and 40 in April, and 37 moved to April 22. The flight comprised 25 males (13a, 5j and 7u), 18 females (6a, 9j and 3u) and 2 birds of unknown sex or age, giving an immature:adult age ratio of 0.74. The median passage date for the species was April 17, for adults it was April 6 and for immature birds April 21 which is coincident with, 9 days earlier and 5 days later than average respectively.

Sharp-shinned Hawk A total of 141 birds were counted on 39 days between March 22 (2 days later than average) and April 22; the total is 154.8% above average and the number of occurrence days is 88.7% above average. The single-day high count of 14 on April 22 is 50% above average. The flight comprised 46 adults, 4 juveniles and 91 unaged birds giving an immature:adult ratio of 0.09. Nine birds were seen in March (+69.6%), 114 in April (+114.3%), 8 in May, and 93 moved to April 22. The median passage date for the species was April 21, 7 days later than average, and for adult birds was April 10, 3 days earlier than average.

Cooper's Hawk The record count of 30 birds comprised 15 adults, 3 juveniles and 8 unaged birds that gives an age ratio of 0.2. Birds occurred on 19 days between March 27 (1 day early) and May 3: the count is 233.3% above average and the number of days on which they were seen is 171.4% above average. The highest daily count was 4 on April 26, 100% above average. Four birds were seen in

March (+233.3%), 22 in April (+103.7%), 4 in May, and 17 moved to April 22. The median passage date for the species was April 22, 8 days later than average and adults were 10 days later than average on April 21.

Northern Goshawk A total of 52 Northern Goshawks were counted on 25 days between February 27 (9 days earlier than average) and April 30. The count is 18.2% above average and the number of days on which they were seen is 8.7% above average. The highest single-day count was 9 on March 28, 58.8% above average. Four birds were seen in February for the first time, 28 moved in March (-9.1%), 20 in April (+7.5%), and 43 moved between March 1 and April 22. The flight comprised 36 adults, 8 juveniles and 8 birds of undetermined age giving an immature:adult ratio of 0.22. The median passage dates of the species was March 28 (1 day earlier than average), for adults it was March 27 (coincident with the average) and for juveniles it was April 9, 12 days later than average.

Broad-winged Hawk A record total of 23 birds were counted on 12 days between April 9 (2 days later than average) and May 3. The count is 90.9% above the average of the last four years and the number of days on which they were seen is 111.8% above average. The highest single-day count was 5 on April 22, 15.4% above average. Twenty-one birds moved in April, 2 in May, and 13 were seen up to April 22. The flight comprised 16 adults (13 light morphs, 3 dark), 2 juveniles (1 light, 1 dark) and 5 light morph birds of undetermined age, giving an immature:adult ratio of 0.13. The median passage date for both the species and for adult birds was April 22, which are 4 and 10 days later than average respectively.

Swainson's hawk A record total of 9 birds were counted on 7 days between April 12 (3 days later than average) and April 30. The count is 237.5% above the average of the last four years and the number of days on which they were seen is 250% above average. The highest single-day counts were 2 on April 14 and 25, which are 15.4% above average. Four birds were seen up to April 22. The flight comprised 6 adults (5 light morphs, 1 dark), 1 dark morph juvenile and 2 birds of undetermined age (1 light, 1 dark), giving an immature:adult ratio of 0.17. The median passage date for the species was April 23

Red-tailed Hawk The total of 278 birds was counted on 35 days between March 9 (6 days early) and May 2, with a single-day high count of 41 on April 9 which are 70.6%, 16.7% and 146% above average respectively. Twenty-seven birds were

recorded in March (-42.1%), 249 in April (+73.4%), 2 in May, and 260 occurred up to April 22. The flight comprised 261 “Western” Red-tailed Hawks (*B.j.calurus*): 237 adults (196 light morphs, 1 intermediate morph, 40 dark morphs), 8 juveniles (7 light, 1 dark) and 16 indeterminate birds (12 light, 4 dark); and 17 adult “Harlan’s Hawks” (*B.j.harlani*) (16 dark, 1 light). The overall immature: adult ratio was 0.02. The median passage date for the species and for adult birds was April 9, both 1 day later than average and for immature birds it was April 16, 7 days later than average. The median passage date for *B.j.calurus* was April 9, 1 day later than average and for *B.j.harlani* it was April 6, 3 days later than average.

Ferruginous Hawk A total of 4 single birds was counted between March 22 and April 21: the total is 33.3% below the average of the last four years. All the birds were adults: 3 light morphs and 1 dark morph. The median passage date for the species was April 7, 4 days earlier than average.

Rough-legged Hawk For the second year in a row there was a relatively low count of the species with a total of 65 birds counted on 27 days between February 23 (6 days earlier than average) and April 30: the total is 2% below average and the number of days on which it was observed was close to average at +1.3%. The highest single-day count was 8 birds on February 26, a total that is 31.4% below average. A record 24 birds moved in February (+1300%), but only 29 in March (-47.8%) and 15 in April (-35.9%). Forty-one birds were counted between March 1 and April 22. The flight comprised 50 light morphs, 12 dark morphs and 3 indeterminate morphs. The median passage date was March 19, 14 days earlier than average.

American Kestrel A record total of 22 birds, 7 males, 7 females and 8 of indeterminate sex, were recorded on 13 days between April 6 (4 days later than average) and May 1; the total and number of occurrence days are 175% and 129.4% above average respectively. Three days had counts of 3 birds (+28.6%): April 20, 26 and 29. Twenty-one birds moved in April and 1 in May, and 12 birds were seen to April 22. The median passage date for the species was April 14, 8 days later than average.

Merlin A record total of 34 Merlins were recorded on 12 days between March 5 (13 days earlier than the average first occurrence) and May 1. The total and

occurrence days are 112.5% and 81.1% above average respectively. The highest single-day count of was 5 birds on April 20, 66.7% above average. All the birds were ascribed to the race *F.c.columbarius* and comprised 1 adult male, 11 indeterminate males, 5 adult females, 3 indeterminate females and 4 birds of indeterminate sex or age. Five birds moved in March, 28 in April and 1 in May, and 24 were counted up to April 22. The median passage date for the species was April 20, 19 days later than average.

Gyr Falcon Five birds were counted on 5 days between March 3 (5 days earlier than average) and the relatively late date of April 28. The total is 25% below average. Two birds were seen in March, 3 in April and 4 were seen up to April 22. All the birds were grey (intermediate) morphs and comprised 4 adults (3 female and 1 of undetermined sex) and 1 juvenile. The median passage date for the species was April 4, 14 days later than average.

Peregrine Falcon A record total of 17 birds was recorded on 12 days between March 23 (4 days earlier than average) and April 29; the total and number of occurrence days are 88.9% and 53.6% above average respectively. The highest single-day count of was 3 birds on April 22 which is 80 % above average. Three birds moved in March, 14 in April, and 10 were seen up to April 22. The flight comprised 16 adults (6 males, 9 females and 1 bird of indeterminate sex) and 1 male of indeterminate age. The median passage date for the species and for adult birds was April 22, 11 and 8 days later than average respectively.

Prairie Falcon A total of 9 birds were seen on 5 days between March 26 (9 days later than average) and April 28. The total is 22.7% above average and the number of occurrence days is 28.6% below average. The highest single-day count was 3 on March 26 which is 125% above average. Five birds moved in March, 4 in April, and 6 were seen up to April 22. The species median passage date was March 28, 1 day earlier than average.

Completing the record count of 2348 birds were 1 unidentified *Accipiter* and 9 unidentified *Buteos* (6 dark and 3 light).

Table 11 summarizes the median passage data for both the Mount Lorette and Beaver Mines sites, and **Table 15** compares the proportions of the raptor groups and passage rates at the three sites.

Further details of this count can be found on the spring 2018 blog on our website: www.eaglewatch.ca.

Acknowledgements All counts were conducted by Peter Sherrington and Hilary Atkinson (69 days), assisted by Asher Warkentin on March 27.

We also thank the friends who assisted us with shopping and preparing meals for us during the count period.

Steeple Ridge extended reconnaissance count, British Columbia

Introduction

In the fall of 2009, Vance Mattson conducted the first extended reconnaissance count at or near the Steeple Ridge which is located on the east side of the Kootenay Valley (Rocky Mountain Trench) 36 km NE of Cranbrook, British Columbia. Three sites were used to monitor raptor movement along, or just north of, the NNW-SSE oriented Steeple Ridge which forms the southern part of the Hughes Range on the western flank of the Rocky Mountains. Of significance is that it is located about 80 km almost due west of the Piitaistakis-South Livingstone and Vicki Ridge/Beaver Mines sites which allows simultaneous monitoring of movement along the eastern and western flanks of the Rocky Mountains at approximately the same latitude. Vance spent 41 partial days (148 hours) at 3 sites between September 18 and November 12, 2009, with 95% of the time being spent between 1300 and 1800 and recorded 453 migrant raptors of 12 species. An extended spring reconnaissance count was conducted at the site for the first time in 2010, and 2020 is the eleventh spring count there (**Table 13**).

During the spring 2020 season a total of 45 days (233.3 hours) was spent in the field. All the observation was conducted at the Bill Nye site with the exception of April 17 and 22 when the count was conducted at the Wolf Creek site for the first time. The number of days is 33.9% above the 2010-2019 average and is the second

highest in the history of the count; the hours are 67.6% above average which is a new spring high for the count.

The **Bill Nye (Scarface)** site is located at 49° 45' 11.10''N, 115° 38' 49.14''W at 1041 metres is named after a prominent 'scar' on the face of the mountain and is a convenient viewing option from Wasa Lake. To access the site from Cranbrook drive north on highway 93/95 past Fort Steele to the south entrance to Wasa Lake, turning right onto Wasa Lake Drive at the Wasa Lake Diner approximately 36 km from Cranbrook. Turn onto Lazy Lake road at 0.4 km then turn right onto an unmarked logging road at 6.9 km (this is before Lazy Lake, and there is a small orange registered trap-line sign posted to a tree at the turnoff. At 1.35 km on this road there is an open viewing area where the forest has been cut. A closer spot, which is the official site, is found by turning right into a clearing at 2.2 km from the main turnoff (a full 2.3 km takes you to the site). Once you have turned off the Lazy Lake road there are multiple areas to view from. This road is somewhat rough but does not require a 4WD or high-clearance vehicle unless the conditions are excessively snowy or wet. The site offers views of the birds as they pass over, or in front of, the main ridge of Mount Bill Nye (averaging 1856 m). Mount Bill Nye has an elevation of 2648 m, though only the most westerly and visible craggy peak ('Scarface Peak') at 2419 m is visible from the site.

The **Wolf Creek** site is located 8.5 km northwest of the Bill Nye site at 49° 51' 07''N, 115° 38' 48''W. From Wasa Lake Park Drive at Wasa Lake, turn on to the Wolf Creek Road at the north end of the lake and follow it roughly 10 km to the large open field. From the field follow the rough road to its most easterly point (do not take Premier Lake FSR which begins in the middle of the field on the north side that takes you north onto Premier Ridge). The site is situated in front of the most westerly face of Teepee Mountain. If you descend the hill to the end of the Wolf Creek Road, which is approximately 2 more kilometres, you have gone too far!

The following two sites have been used in the past but were not used this season.

For the **Steeple** site, the government link at:

<http://www.env.gov.bc.ca/bcparks/explore/parkspgs/norbury/> provides GPS, maps and directions. Scroll down and click on the link called "Location Map", then click on the most northerly tree icon (there are several "trees", each for a provincial park) and receive clear directions from your location by clicking on "Get Directions" and then entering your location. The site is at Norbury Provincial Park which is on the east side (turn right when heading south on the Warder-Fort Steele

road). You will see a large parking area in front of the lake and the prominent Steeples Ridge will be directly in front of you. If you choose to observe from this location you may wish to walk 5 minutes NE from the parking lot into a field between two tree areas. This will give you privacy and a good view of the Steeples. Note that there is often a nesting pair of Bald Eagles in the trees to the west, so be mindful of their presence and space.

The **South Lakit** site provides views of the birds coming head-on and often at lower elevations. From Cranbrook drive to the Fort Steele gas station, turning right off the main highway onto the Wardner-Fort Steele road. Turn left onto the Wildhorse River FSR (you will see a yellow sign, and note that this turnoff is just 0.3 km from the highway turnoff). The Wildhorse FSR road is gravel, somewhat rough, has many bends, a steep ravine on one side and has some elevation changes. Extreme caution is therefore recommended as well as a vehicle with good tires, *especially in snowy conditions!* At 5.3 km turn left off the Wildhorse FSR onto a side road. You will immediately see a short incline on a rough road. From here you have three options: 1) watch from this location; 2) walk up the hill 0.5 km to a flat area which can be used for viewing, or continue to walk another 0.5 km following the road to a better viewing platform or 3) drive to either of these spots if you have a 4WD vehicle with moderate clearance. The total distance from the highway turnoff to the highest and best viewing area is 6.6 km.

Weather and General flight dynamics

A total of 8 days were lost to inclement weather: March 7, 8, 13, 14, 30 and 31 all of which had snow all day that obscured the ridges, and April 11 and 18 when low overcast conditions obscured the ridges. Owing to teaching commitments up to March 16 observation could commence only after 1530. Hourly weather data were not gathered but daily weather summaries were produced. (**Table 14**).

Unlike the sites east of the mountains the daily high temperature only failed to rise above freezing on April 1, 2 and 3 when it reached -1°C. The average temperature for active days in March was 6.5°C (range 0°C to 11°C) and in April was 10°C (range -1°C to 19°C which was reached on April 21). Winds on active days were SW-W 26.7% of the time, S 22.2%, N-NW 6.7%, SE 4.4%, variable 2.2% and calm 37.8% of the time. Calm to light winds prevailed 53.3% of the time, calm to moderate 4.4%, light to moderate 11.1%, light to strong 4.4%, moderate 11.1%, moderate to strong 8.9% and strong 6.7%. On active observation days the ridges were obscured on 1 day and partly obscured on 7 days.

Raptor movement began slowly and sporadically (**Figure 9**) with only 62 birds counted to March 14 but peaked from March 15 to 25 when 11 days produced 325 migrants that included 240 Golden Eagles and constituted 66.5% of the total raptor movement and 73% of the Golden Eagle movement. The highest single day count was March 18 which saw 98 migrants including 85 Golden Eagles. The subsequent 28 days of observation yielded only a further 102 migrants including 42 Golden Eagles. Only three days during this period produced double-digit counts: 14 on April 6, 13 on April 9 and 16 on April 12.

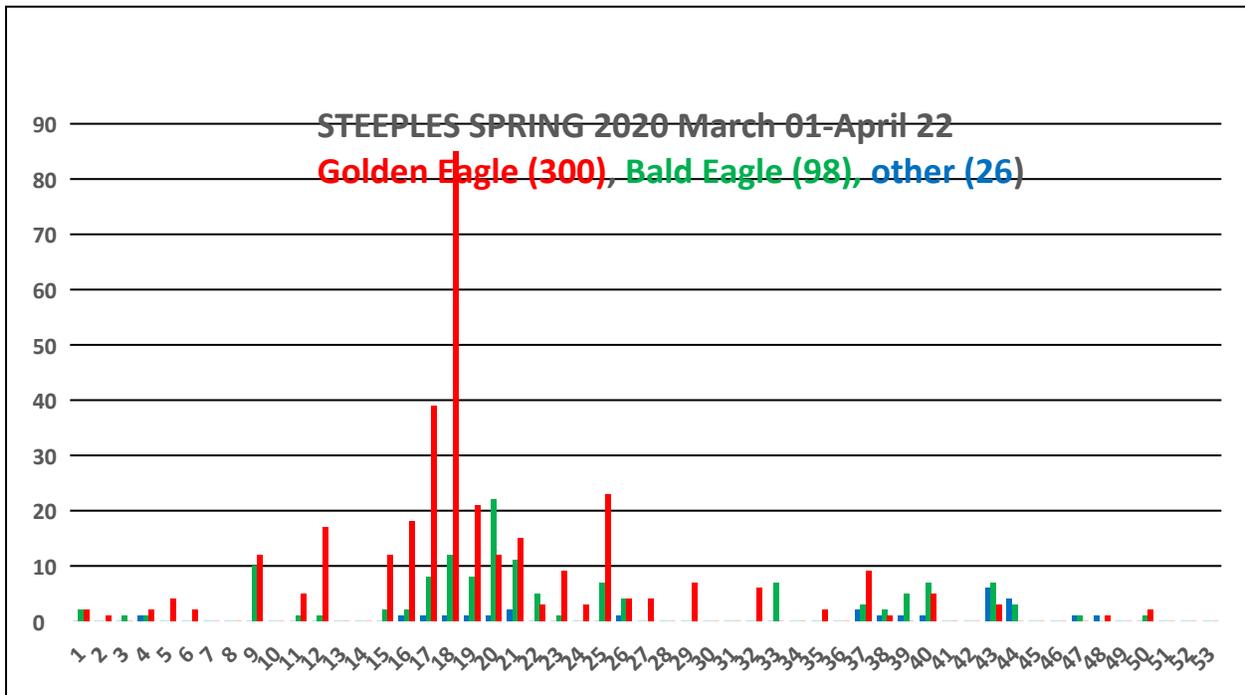


Figure 9

Count Summary

Despite the increased observation this season, only 489 migrant raptors of 12 species were counted which is 9.2% lower than the average of the last 10 years (**Table 13**). As is usual for spring counts the two eagle species predominated and this year comprised 94.7% of the total. The count was 2 Turkey Vultures (-76.7%), 1 Osprey (-23.1%), 134 Bald Eagles (-6.8%), Northern Harrier 1 (+42.9%), Sharp-shinned Hawk 3 (-45.5%), Northern Goshawk 1 (-47.4%), Red-tailed Hawk 9 (-21.1%), Rough-legged Hawk 3 (-14.3%), Golden Eagle 329 (-7.7%), Merlin 2 (+1900%), Gyrfalcon 1 (first spring record), Peregrine Falcon 1 (+25%) and 2 unidentified eagles. The only species seen on previous counts but absent this year

was American Kestrel, while Cooper's Hawk, Broad-winged Hawk, Swainson's Hawk, Ferruginous Hawk and Prairie Falcon have never been recorded at the site in the spring (**Table 13**). March saw movement of 407 raptors of 6 species (-3%), and 82 birds of 10 species moved in April (-8.8%) (**Figure 9, Table 13**).

Bald Eagle

A total of 134 Bald Eagles was recorded on 26 of a possible 45 active days between March 1 and April 19, with a single-day high count of 22 on March 20, but only 2 other days had double-digit counts (**Figure 9**). The total is 6.8% above the 2010-2019 average. The March count was 98 birds (-8.8%) and 36 birds moved in April (+26.3%). The flight comprised 78 adults, 12 subadults, 43 juveniles and 1 undifferentiated immature bird, giving an immature:adult ratio of 0.72 which, as usual, is higher than the ratios of 0.65 at Mount Lorette and 0.33 at Beaver Mines.

Golden Eagle

A total of 329 migrant Golden Eagles were recorded on 30 of a possible 45 active field days (59.5%) between March 1 and April 19, with a highest single day count of 85 on March 18 and a second highest count of 39 on the previous day (**Figure 9**). The total is 7.7% below the 2010-2019 average and is the lowest count at the site since 2015. Ten days had double-digit counts this season, 7 of which occurred between March 15 and 21. The flight comprised 270 adults, 9 subadults, 382 juveniles and 18 birds of unknown age giving an immature:adult ratio of 0.15, which compares to a ratio of 0.21 at Mount Lorette and of 0.24 at Beaver Mines.

Other Species

Turkey Vulture Single adult birds were seen on April 7 and 8. The total is 76.7% below average.

Osprey A single bird occurred on April 12. The total is 23.1% below average.

Northern Harrier A single adult female was seen on April 12. The total is 42.9% above average.

Sharp-shinned Hawk One adult bird was seen on April 12 and 2 adults on April 13. The total is 45.5% below average.

Cooper's Hawk Never recorded at the site in spring.

Northern Goshawk A single adult on March 4 was the season's sole record. The total is 47.4% below average.

Broad-winged Hawk Never recorded at the site in spring.

Swainson's Hawk Never recorded at the site.

Red-tailed Hawk Nine birds were counted on 6 days between March 16 and April 13. The count is 21.1% below average. All birds were adult light morph "Western Red-tailed Hawks" (*B.j.calurus*).

Rough-legged Hawk A total of 3 birds were counted on 3 days: 1 light morph on March 25, 1 dark morph on April 6 and 1 light morph on April 17. The count is 14.3% below average.

American Kestrel Not recorded this year. It has occurred on 6 previous counts.

Merlin Single unaged and unsexed *columbarius* Merlins were seen on April 9 and April 12. The only previous record for the site was a single bird seen in 2017.

Peregrine Falcon An adult bird was seen on April 6. The total is 25% below average.

Gyr Falcon A single adult grey (intermediate) morph bird seen on March 17 was the first spring record for the site.

Prairie Falcon Never recorded at the site.

Completing the count of 489 birds were 2 unidentified eagles.

Observers at Steeples

All counts were conducted by Vance Mattson, assisted by Virginia Rasch, Daryl Calder and Marianne Kahm on March 1.

Comparison of three sites by raptor categories

Percentage of raptor categories at the three sites spring, 2020
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	Mount Lorette	Steeples	Beaver Mines
Turkey Vulture	0	0.41	0.68
Osprey	0.16	0.2	0.77
Northern Harrier	0.2	0.32	1.03
Eagles	96.34	92.3	66.87
<i>Accipiters</i>	3.39	0.82	9.54
<i>Buteos</i>	2.69	2.45	16.52
Falcons	0.81	0.82	3.71

It is again interesting to note how closely the Mount Lorette and Steeples sites compare in percentage occurrence of raptor categories, both having an overwhelming dominance of eagle species. At Beaver Mines, although eagles are the most significant

element of the migration, harriers, falcons, and especially *Accipiters* and *Buteos* also occur in significant numbers. This results from the fact that at both Mount Lorette and Steeples the birds are migrating above high mountain ridges, whereas at Beaver Mines they are moving along a foothills ridge just east of the mountains.

Comparison of Golden Eagle counts at the three sites

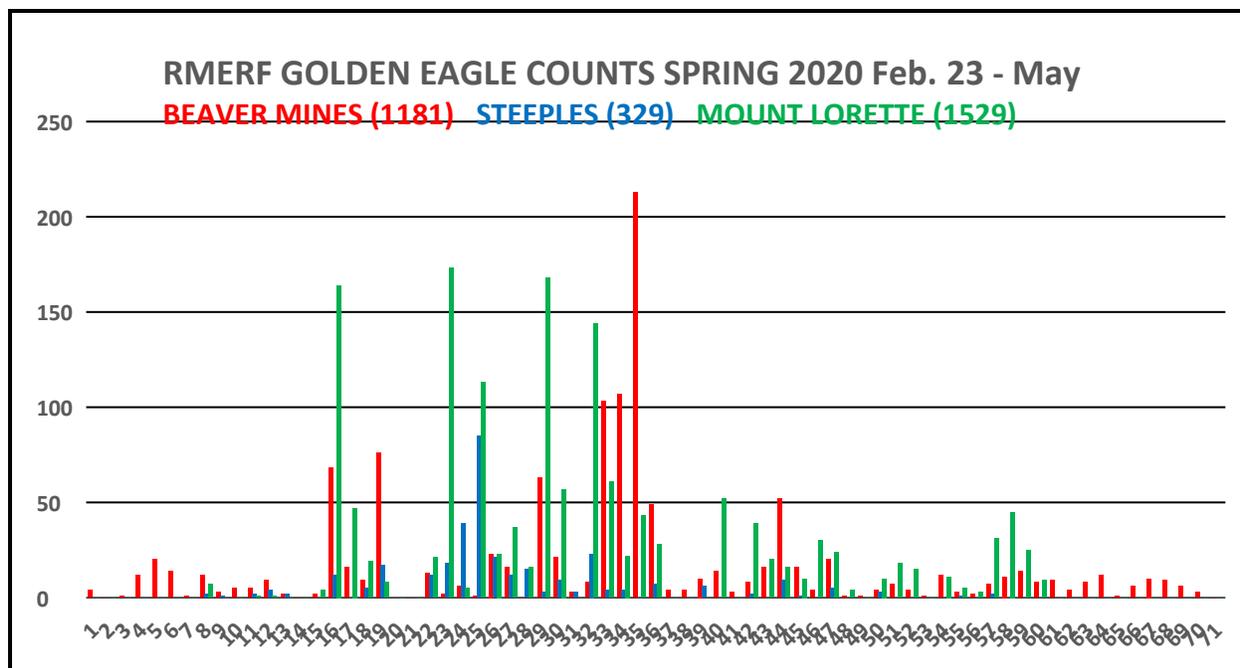


Figure 10

Figure 10 and **Table 16** plot the daily counts of Golden Eagles at the three sites between February 23 (#1) and May 3 (#71) which was the length of the Beaver Mines count. Mount Lorette and Steeples counted between March 1 (#8) and April 22 (#60). **Table 16** breaks the counts into 16 phases that include 7 periods of snow conditions that were common to all three sites.

- 1 **February 23-29** Fifty-two Golden Eagles seen at Beaver Mines with steady movement interrupted by 3 days of poor weather.
- 2 **March 01-06** Counting starts at both Mount Lorette and Steeples but movement is still strongest at Beaver Mines (36 birds)
- 3 **March 7-8** Widespread snow; all sites shut down on 7th and only weak movement at Beaver Mines and Lorette on the 8th.
- 4 **March 9-12** Rapid increase in movement especially at Mount Lorette where the period yields 757 birds including 164 on March 9.
- 5 **March 13-14** All sites snowed in.
- 6 **March 15-25** Peak movement at Mount Lorette with 757 migrants including 173 on March 16 (the highest for the count), 113 on March 18, 168 on March 22 and 144 on March 25. There was also peak movement at Steeples with 240 birds including 85 on March 18. Only 156 birds were seen at

Beaver Mines and it seems likely that as last year, many birds moved west of the site in this period, many of which probably reached the western flank of the Rockies at Steeples.

- 7 **March 26-29** Peak movement at Beaver Mines with 472 migrants including 213 on March 28, the highest count at any site this spring. Only 154 at Mount Lorette and weak movement (15) at Steeples.
- 8 **March 30-31** Poor weather with Lorette and Steeples shut down and only 8 birds at Beaver Mines.
- 9 **April 1-2** Moderate recovery at Lorette and Beaver Mines, weak movement at Steeples.
- 10 **April 3** Poor weather: Lorette shut down, just 3 birds at Beaver Mines.

- 11 **April 4-9** Similar movement at Mount Lorette (139) and Beaver Mines (119), last significant movement at Steeples (17).

- 12 **April 10-11** Poor weather: just 4 birds at Lorette and 3 at Beaver Mines.

- 13 **April 12-14** Moderate movement at Lorette (43), poor movement at Beaver Mines (15) and Steeples (3).

- 14 **April 15** Poor weather: Lorette shut down, only 1 Bird at Beaver Mines.

- 15 **April 16-17** Similar moderate movement at Lorette (16) and Beaver Mines (15); just 1 at Steeples.

- 16 **April 18** Poor weather: 3 birds at Lorette and 2 at Beaver Mines.

- 17 **April 19-22** Strong finish to the count at Mount Lorette with 110 birds in 4 days; 40 at Beaver Mines and only 2 at Steeples. End of Mount Lorette and Steeples counts.

- 18 **April 23-May 3** Steady daily movement of up to 12 birds continued at Beaver Mines. No Golden Eagles seen on May 3.

After the last big movement at Mount Lorette on March 25, only 521 further birds were seen at Mount Lorette up to the end of the count on April 22, but in the same period 698 birds were counted at Beaver Mines that indicates that there were 177 birds that migrated over Beaver Mines that were not seen at Mount Lorette. The late fairly strong movement (110) at Lorette during the last four days of the count might indicate that the wave of phase 7 at Beaver Mines (March 26-29) only reached Lorette on April 19, but this would involve a 3-week delay which is unlikely. It seem more reasonable to conclude that the 177 “missing” birds moved to the NW east of the Lorette site, probably using the westernmost foothills ridge that is observed from the Lusk Creek site when the mountains at the Mount Lorette site are obscured.

Appendix (separate attachment)

List of Tables

Table 1 Mount Lorette: Daily count numbers, spring 2020

Table 2 Mount Lorette. Summary of spring counts 1992-2020

Table 3A Mount Lorette. Summary of spring counts 1993-2020, March 01-April 22 (all counts)

Table 3B Mount Lorette. Summary of spring counts 1993-2020, March 01-April 22 (excluding 2008-2010 and 2012)

Table 4A Mount Lorette. March summary totals 1993-2020 (all counts)

Table 4B Mount Lorette. March summary totals 1993-2020 (excluding 2008-2010 and 2012)

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Table 12 Steeples. Daily count numbers, spring 2020

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Table 14 Steeples. Summary weather data, spring 2020

Table 15 comparison of raptor classes at all three sites, spring 2020

Table 16 Golden Eagle movement phases at all three sites, spring 2020



.....*AND STILL COUNTING!*