

MOUNT LORETTE AND BEAVER MINES, ALBERTA, SPRING 2017

With notes on the Steeples, BC reconnaissance count

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Summary and highlights

Following a reconnaissance count at the site in 1992, this was the 25th consecutive year that a systematic spring count has been held at Mount Lorette. It is the 9th 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 were conducted this season in weather characterized throughout by temperatures that were significantly below seasonal normals and with higher than average snowfall as a La Niña oceanic cycle replaced several years of El Niño conditions.

At Mount Lorette the combined species count of 2672 was 18.4.1% below average, with the March total accounting for 83.3% of the final count. The Golden Eagle count was 2256 which was 23.9% below average, but the immature:adult ratio of 0.21 was the highest ever spring ratio at the site which may in part be attributable to the relatively low numbers of adult birds seen this spring. With the exception of the two eagle species most species' median passage dates were later than average, although at Beaver Mines a few birds of some species arrived exceptionally early. At Mount Lorette 11 of the regularly occurring 14 species occurred in above average numbers.

The Golden Eagle count remained close to average for counts conducted since 2003 and suggests that the population may have stabilized following a significant decline in numbers between 1995 and 2002.

The count at Beaver Mines was extended to 56 days and produced 1994 raptors of 18 species, but again a disappointing total of 1069 Golden Eagles indicates that the main movement of this species is farther to the west in the spring.

The eighth reconnaissance count at the Steeples count on the western flanks of the Rocky Mountains near Cranbrook, BC was only 15 days but produced a count of 515 birds including 386 Golden Eagles that included a single-day site record of 133 birds on March 17. The migration rate of 7.41 raptors/hour is a record for the site and is 107.3% above average.

Members and supporters of the Rocky Mountain Eagle Foundation gathered at the Hay Meadow on March 20 to celebrate the 25th anniversary of the start of the project at Mount Lorette.

Introduction

The Mount Lorette site is located in the Kananaskis Valley in the Front Ranges of the Rocky Mountains (50°58'N 115°8'W) 70 km due west of Calgary and immediately 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 2500m with Mount McDougall rising to 2726m. Mount Lorette itself is 2487m 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 (2958m), Mount Bogart (3144m) and Mount Allan (2819m). The observation site is in a cleared area on the valley floor known as the Hay Meadow at an elevation of 1433m. 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, 13km 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 2005, 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 Golden Eagle migration. The Lorette counts in 2006, 2007 and 2008 were conducted between March 01 and April 15 and comprised 44 days, 46 days and 48 days of active observation respectively. **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 2012 are anomalously low compared to other counts. 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 during the same time period. **Table 3A** summarizes all the counts conducted at Mount Lorette for the period March 1 to April 22 1973-2017. **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.

Once again no count was held this season at the Piitaistakis-South Livingstone site, and so this report concerns only the count at Mount Lorette, a count starting on February 25 at Beaver Mines in SW Alberta and a 15 day reconnaissance count conducted by Vance Mattson at the Steeples site on the western flank of the Rocky Mountains in British Columbia.

At Mount Lorette observers spent a total of 51 days (584.2 hours) of a possible 53 days at the site between March 1 and April 22, the days and hours being 4.7% and 15.5% above the average of valid counts since 1993 respectively.

The reconnaissance counts that were conducted by Peter Sherrington at Beaver Mines in 2014 and 2015 and a full count in 2016 was extended this year to a 56 day (510.1 hours) count of a possible 57 days between February 25 and April 22.

At the Steeples reconnaissance count in BC Vance Mattson, because of teaching commitments, could only spend 15 days (69.5 hours) of a possible 40 days at the site between March 1 and April 8. This is the eighth consecutive spring season that this count has been held.

Mount Lorette, Alberta

Weather

Table 6 summarizes the weather data from this season's count. During the count only 2 days (March 4 and April 12) was completely lost to adverse weather (36.8% below the average of the last 6 years, all of which used the same count period), and no other day was significantly shortened because of the weather. A total of 31 active days (60.1%) experienced precipitation (excluding days with occasional flurries or drizzle) which is 46.3% above average. Snow fell on 23 active days (45.1%) which is 44.2% above average and rain fell on 8 days (15.7%: 149.9% above average).

The highest maximum temperature was only 12°C on April 5 and the lowest maximum was -14°C on March 9 and 10; the highest minimum temperature was 5°C on March 22 and April 6 and the lowest minimum was -26°C on March 18. On 9 active days the temperature failed to rise above 0°C all day (15.6% above average).

Regrettably, yet again the Environment Canada Nakiska Ridgetop weather station situated 4 km west of the Hay Meadow site on Olympic Summit (Mount Allan) at 2543 m was inoperative and ridge wind information had to be estimated by observers. It should be noted that experience has demonstrated that wind velocities tend to be underestimated by observers located in the valley. On cloudless days or when the ridges were cloaked in cloud estimating the wind direction and velocity was difficult, but reference to the weather station at Banff situated to the NW of the site provided information on general wind conditions on such days. Observers assessed ridge winds to be from the SSW-W 86.3% of the time, from the WNW-NW 1.9% from the NW-NE 5.9%,

and from other directions and variable winds 5.8%. Compared to the average of the last six years the prevailing SSW-W winds were 20.2% above average.

On active observation days ridge wind speeds were assessed as strong to very strong (40 km/h to >100 km/h) 13.7% of the time, moderate to strong (10 to 100 km/h) 29.4% of the time, moderate (10-40 km/h) 27.5%, light to moderate (1-40 km/h) 15.7% and light winds occurred 11.8% of the time. On 1 day (1.9%) winds varied from light to strong. Compared to average, strong to very strong winds were 19.1% below average, moderate to strong winds were 9.9% below average, moderate winds were 72.2% above average, light to moderate winds were 30.0% below average and light winds were 76.6% above average.

Eight active days (15.7%) experienced cloud cover between 80 and 100% all day. And a total of 36 days (70.6 %) experienced 100% cloud for at least part of the day. The eastern ridge system (Fisher Range and Mounts Lorette and McDougall) was at least 10% obscured on 23 active days (43.1%), and 40-100% obscured on 15 active days (29.4%); the western ridge system (Mounts Kidd, Bogart, Allan and Collembola) was at least partly obscured on 26 active days (50.0%), and 40-100% obscured on 23 active days (31.4%). Severe daily occlusions (40-100%) of the eastern ridges on active days were 19.2% above average while the western ridges were occluded 10.5% below average.

After 5 years under the influence of El Niño oceanic conditions which produced a succession of relatively mild springs, this year saw the start of a La Niña cycle which produced a season that was significantly colder than average, precipitation was significantly above normal with snow days much more prevalent than rain days, ridge winds were predominantly SSW-W as usual but strong winds were less and moderate winds significantly more than average, but cloud cover and ridge occlusion were both close to average.

General flight dynamics March 1 to April 22

A total of 2672 migrant raptors of 15 species were counted on all 47 active observation dates between March 1 and April 22 (**Table 1**). The combined species total was 8.9% below the long-term average of all counts for the period March 1 to April 22 at the site (**Table 3A**), but 18.4% below average when the anomalously low counts are excluded (**Table 3B**). A total of 16 days (31.4%) had counts of 10 birds or less. There was no significant raptor movement until March 11 when 94 birds (68 Golden Eagles) were counted followed by 193 birds (168 Golden Eagles) over the next 2 days. Movement was fairly persistent throughout the rest of the month with a total of 2227 raptors of which 2014 were Golden Eagles counted in March which were 14.3% and 18.0% below the average of valid counts respectively (**Table 4B**). The highest single-day count was 387 (363 Golden Eagles) on March 19 followed by 331 (323 Golden Eagles) on March 20. Other 100+ combined species counts were 268 on March 24, 234 on March 17 and 104 on March 12. The high count of 387 is 5.5% below average. The March combined species total of 2227 represented 83.3% of the total spring 2017 count. Movement continued to be persistent in April, with a high combined species count of 69 on April 8, and April 22, the last day of the count, saw a movement of 54 birds. The April total of 445 is 34.4% lower than the long-term average of valid April counts (**Table 5B**).

Of the 14 species that regularly occur during the period (**Table 3B**) 11 species occurred in above average numbers: Bald Eagle 216 (+19.4%) which was the highest count since 2002, Northern Harrier 5 (+4.2%), Cooper's Hawk 9 (+33.3%), Northern Goshawk 27 (+17.4%), Broad-winged

Hawk 3 (+1900%) which was the highest spring count ever, Swainson's Hawk 2, which is the first record for the site during the current count period, Red-tailed Hawk 70 (+145.2%) which is the highest spring count ever, Rough-legged Hawk 23 (+18.9%). American Kestrel 4 (+321%), Merlin 11 (+64.2%), Gyrfalcon 3 (+150.0%) which equals the highest count with 5 other years, Peregrine Falcon 4 (+247.8%) which is also the highest spring count for the site. Three species occurred in lower than average numbers: Sharp-shinned Hawk 16 (-35.5%), Golden Eagle 2256 (-23.9%) and Prairie Falcon 1 (-53.5%). Three species, Turkey Vulture, Osprey and Ferruginous Hawk, were not recorded this year.

The final count was Turkey Vulture 0, Osprey 0, Bald Eagle 216, Northern Harrier 5, Sharp-shinned Hawk 16, Cooper's Hawk 9, Northern Goshawk 27, *Accipiter* sp. 0, Broad-winged Hawk 3, Swainson's Hawk 2, Red-tailed Hawk 70, Ferruginous Hawk 0, Rough-legged Hawk 23, *Buteo* sp. 5, Golden Eagle 2256, eagle sp. 13, American Kestrel 4, Merlin 11, Gyrfalcon 3, Peregrine Falcon 4, Prairie Falcon 1, *Falco* sp. 2 and indeterminate raptor 2, for a total of 2672 migrant raptors of 15 species.

The combined species median passage date was March 20 which was 2 days earlier than the long-term average that reflects the numerical dominance (92.5%) of the two eagle species. Of the 9 species occurring in sufficient numbers to calculate median passage dates only 3 were earlier than average (Rough-legged Hawk 22 days, Bald Eagle 4 days and Golden Eagle 2 days), while 6 species were later than average (Merlin 18 days, Northern Goshawk 8 days, Northern Harrier and Cooper's Hawk 7 days, Red-tailed Hawk 5 days and Sharp-shinned Hawk 4 days) (**Table 11**)

Detailed daily summaries of weather and flight dynamics can be found on the spring 2014 blog on the RMERF website www.eaglewatch.ca

Golden Eagle

Observers counted a total of 2256 migrating Golden Eagles on 45 days between March 1 and April 22, with the highest single-day count of 363 occurring on March 19 (**Figure 1**). The number of days on which the species was recorded is 0.3% above average, the total is 23.9% below the long-term average and the high count is 9.1% below average. Four other days also had counts of over 100 birds: March 19 (331), March 24 (268), March 17 (234) and March 12 (104).

The March count of 2014 was 8.3% below the average of all counts at the site (**Table 4A**), but when the anomalously low counts are excluded the figure falls to -18.0% (**Table 4B**). The April count of 242 is 52.3% below the average excluding the anomalously low counts (**Table 5B**). The flight comprised 1301 adults, 110 subadults, 158 juveniles, 7 undifferentiated immature birds and 680 birds of unknown age yielding an immature:adult ratio of 0.21 which is 147.1% above the long-term average ratio and is the highest ever spring ratio at the site. The high ratio reflects the high fall 2016 ratio of 0.39, but possibly also in part the relatively low numbers of adult birds seen this spring.

The median passage date for the species and for adult birds was March 20, which were both 2 days earlier than average respectively. The median passage date for immature birds was April 26, which is 12 days earlier than average.

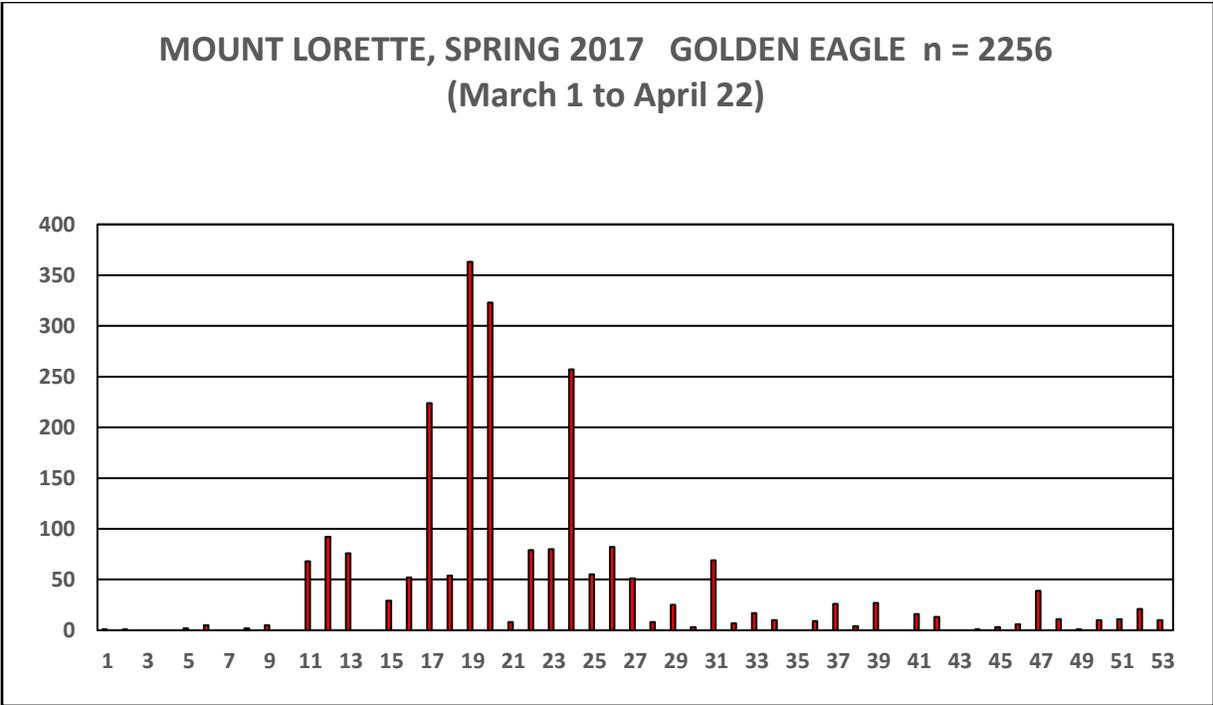


Figure 1

The pattern of the hourly cumulative counts (**Table 7, Figure 2A**) closely conforms 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 slow build-up to 1000-1100 followed by a steady systematic increase in numbers that peak at 346 between 1600-1700, coincident with the average, and again systematically diminishing thereafter. The only hours that registered counts above an average of one bird per minute were 68 (1400-1500) and 64 (15-1600) on March 20, and 63 (1400-1500) on March 19. Only 1 bird moved before 0700 and none were seen after 1900 (MST).

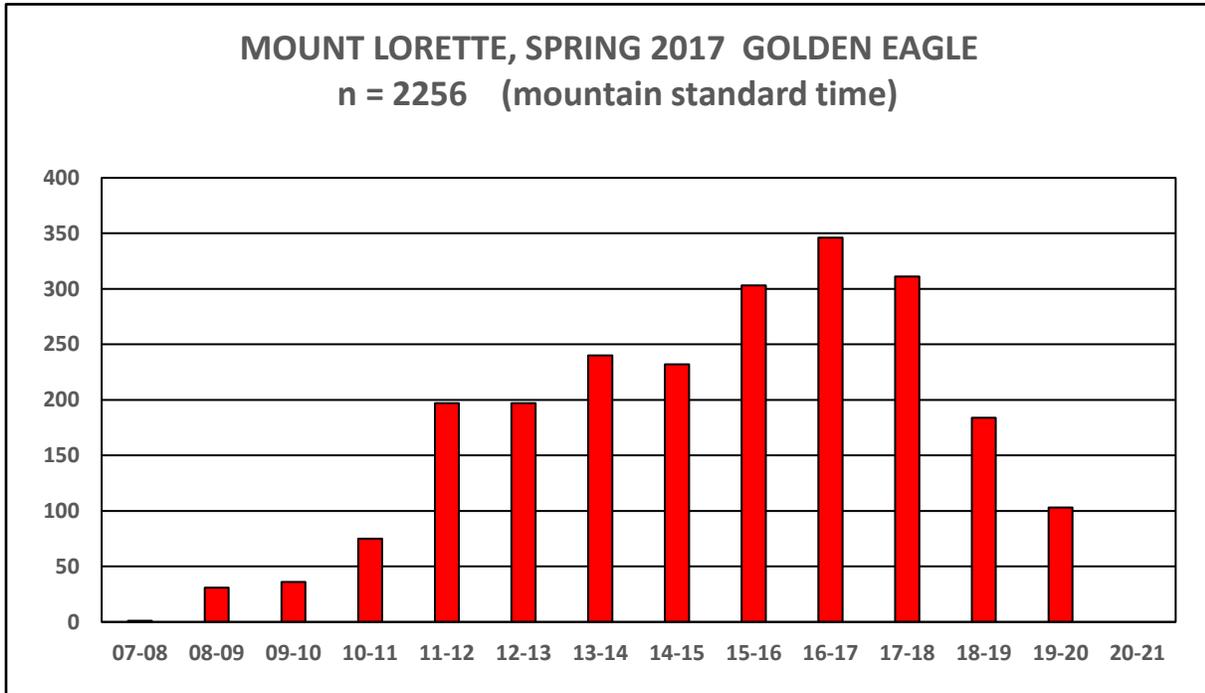


Figure 2A

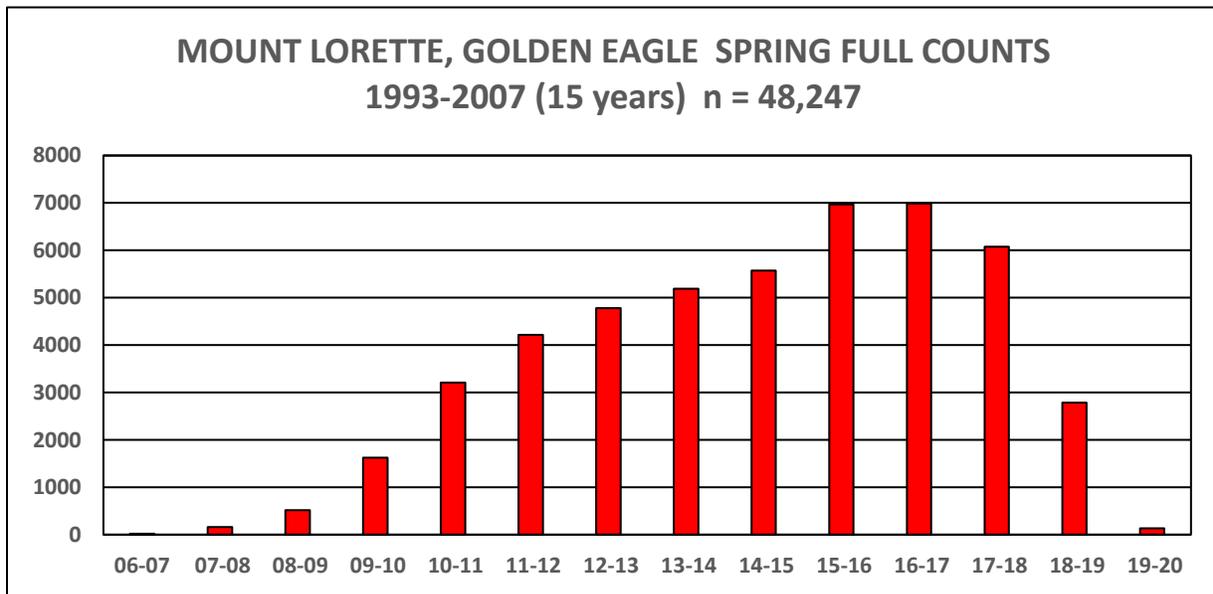


Figure 2B

Spring Golden Eagle Trend

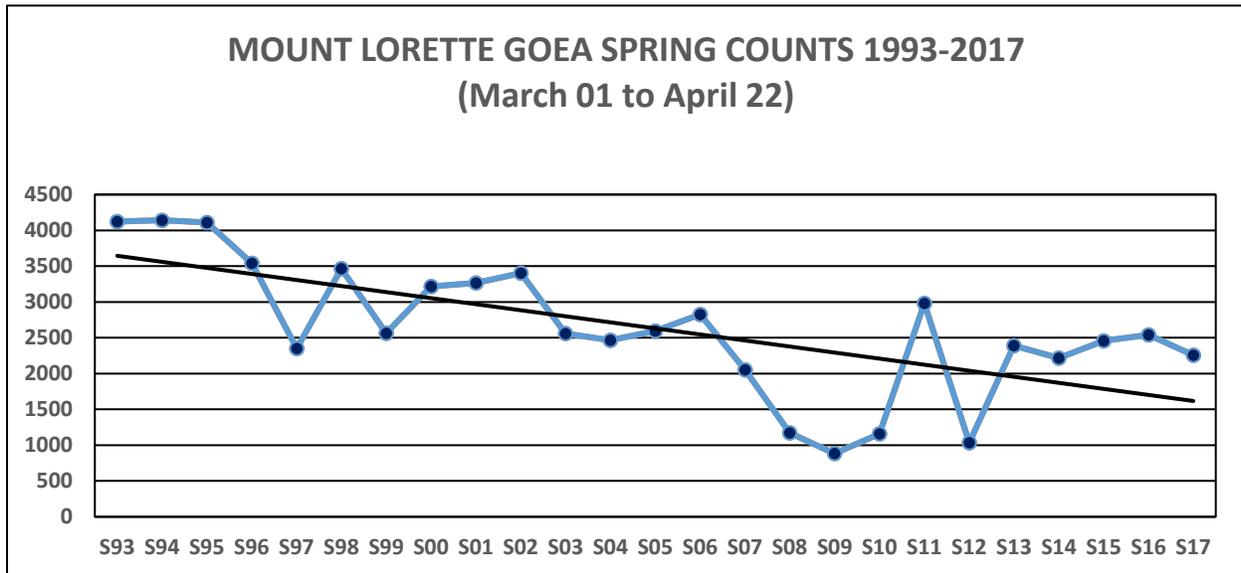


Figure 3A

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**.

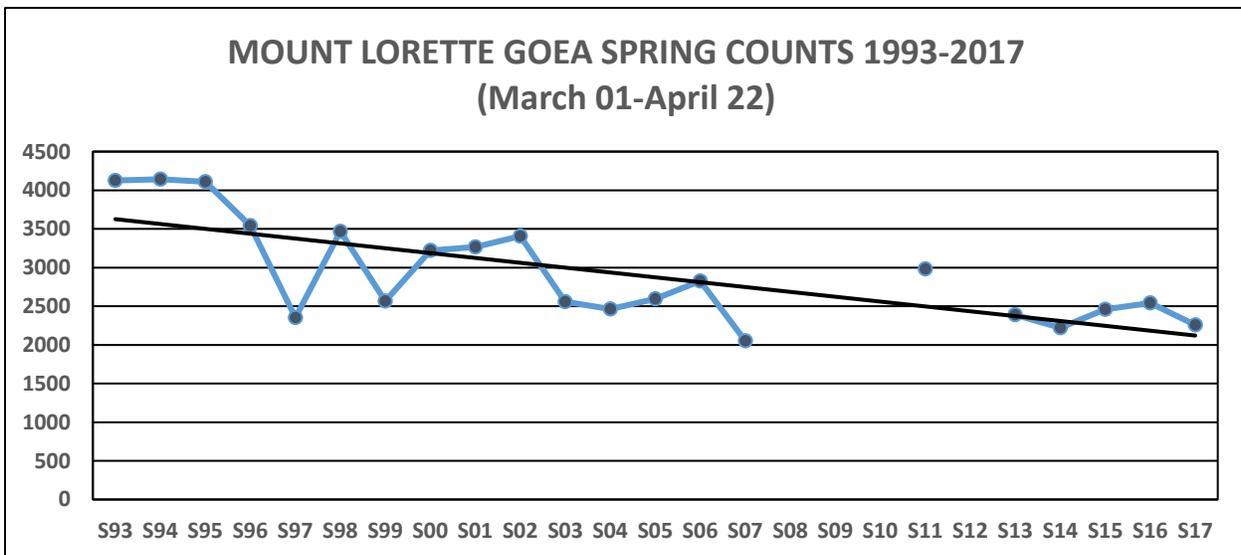


Figure 3B

The weather at the site since 2007 has generally been 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 significant decline and removal of the recent 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 only valid counts since 2003 are considered, however, (**Figure 3D**) the trend is almost horizontal suggesting that the population has remained stable over this 14-year period, following a significant decline between 1995 and 2002 (**Figure 3C**).

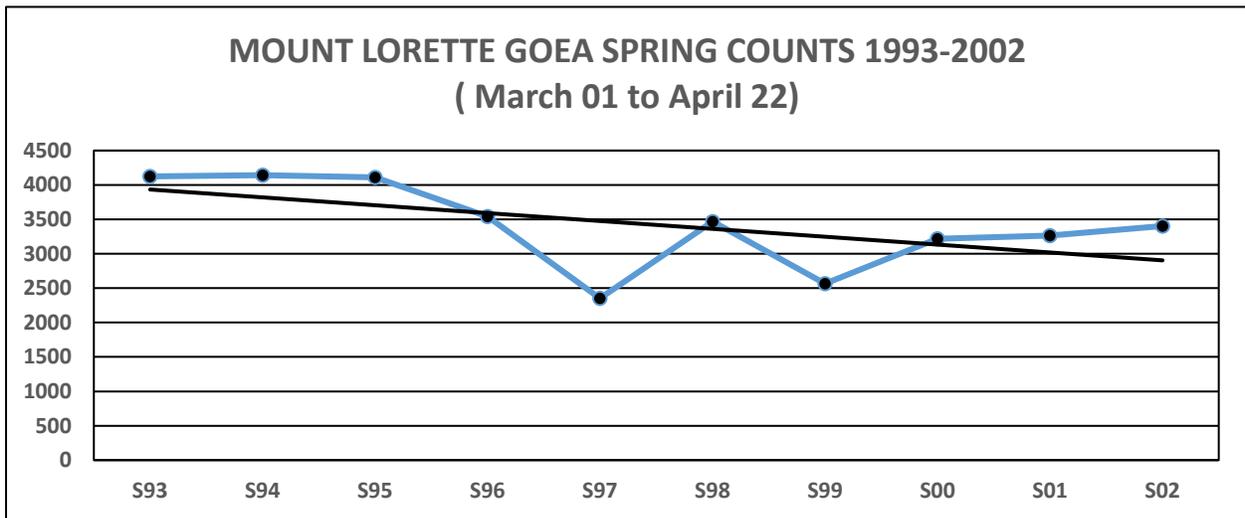


Figure 3C

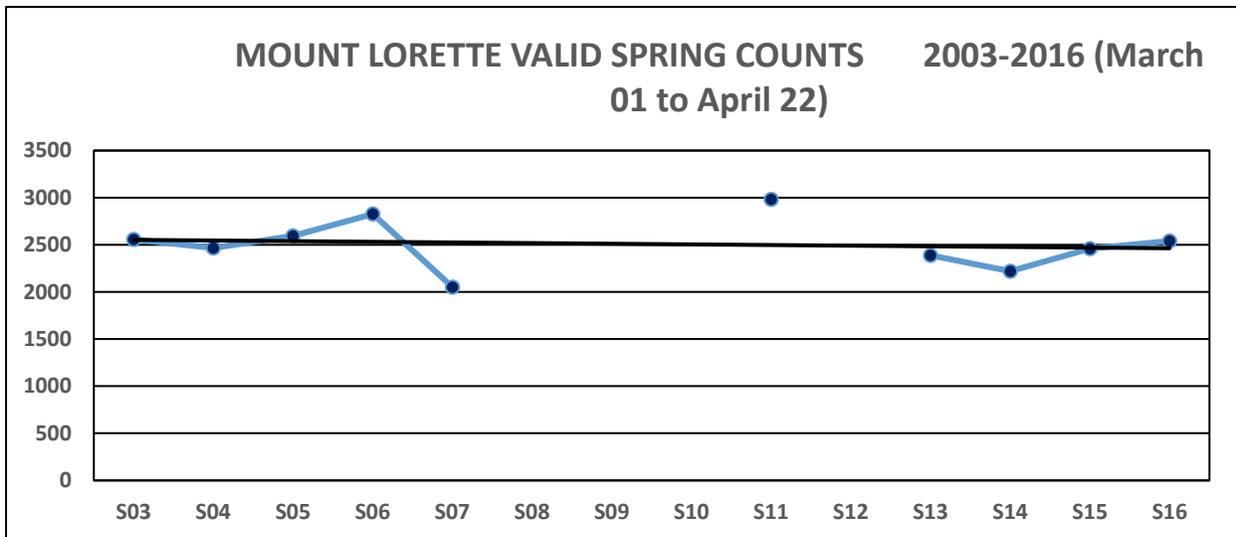


Figure 3D

Golden Eagle Age Analysis

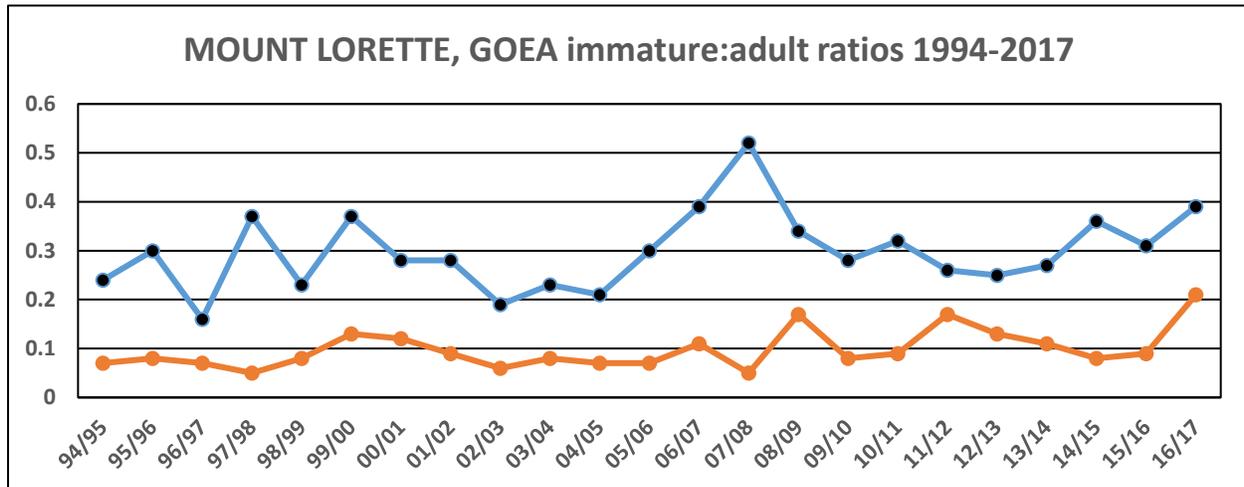


Figure 4

Figure 4 shows the ratio of immature and adult Golden Eagles from 1994 to 2017. 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 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 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). 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 2000/01, that then fell to 2003 before rising to the latest peak in 2008 with the ratio falling over the next two years. This would indicate that three, more or less, eight-year cycles have occurred during the life of the project so far. In some years many juvenile Golden Eagles move during the second half of April and during May which is why the age ratios from the shorter count are lower. It is very gratifying, however, to see that data from the period March 1 to April 22 closely follow the trend established from the full count data (see the 2012 spring report). This suggests that we can successfully continue to monitor these trends by counting from March 1 to April 22, although it is to be hoped that at some time we will be able to resume full counts at the site. The age ratio from the fall 2013 and 2014 counts suggest that breeding success is beginning to increase again with numbers beginning to rise towards the next peak and this is strongly indicated by the fall 2016 and spring 2017 ratios. It is probable that the ratio will peak in the fall of 2017. Reports from the Yukon⁵ suggest that 2013 saw a significant rise in the number of Snowshoe Hares, and this should be reflected in the number of juvenile birds recorded on the fall count for the next few years. The spring 2017 ratio of 0.21, which is the highest ever recorded in the spring at the site, continues this strong upward trend.

Bald Eagle

Observers counted 216 Bald Eagles on 35 days between March 2 and April 22 (**Figure 5**). This was highest count since 2002, and is 31.0% above the long-term average of all counts, and 19.4% above the average excluding the low counts of 2008-10 and 2012. The highest daily count was 25 on April 8 which is the highest single day count since 2000 and is 18.8% above the average high count (excluding low counts) for the period. The March count of 151 was 51.5% above average and the April count of 65 was 9.7% below average. The flight comprised 158 adults, 21 subadults, 22 juveniles, 4 undifferentiated immature birds and 11 birds of indeterminate age giving an overall immature:adult ratio of 0.3 which is 12% below the long-term average ratio. The median passage date for the species was March 24, 4 days earlier than average; adult birds were 3 days earlier than average on March 26 and immature birds were 4 days early on March 26.

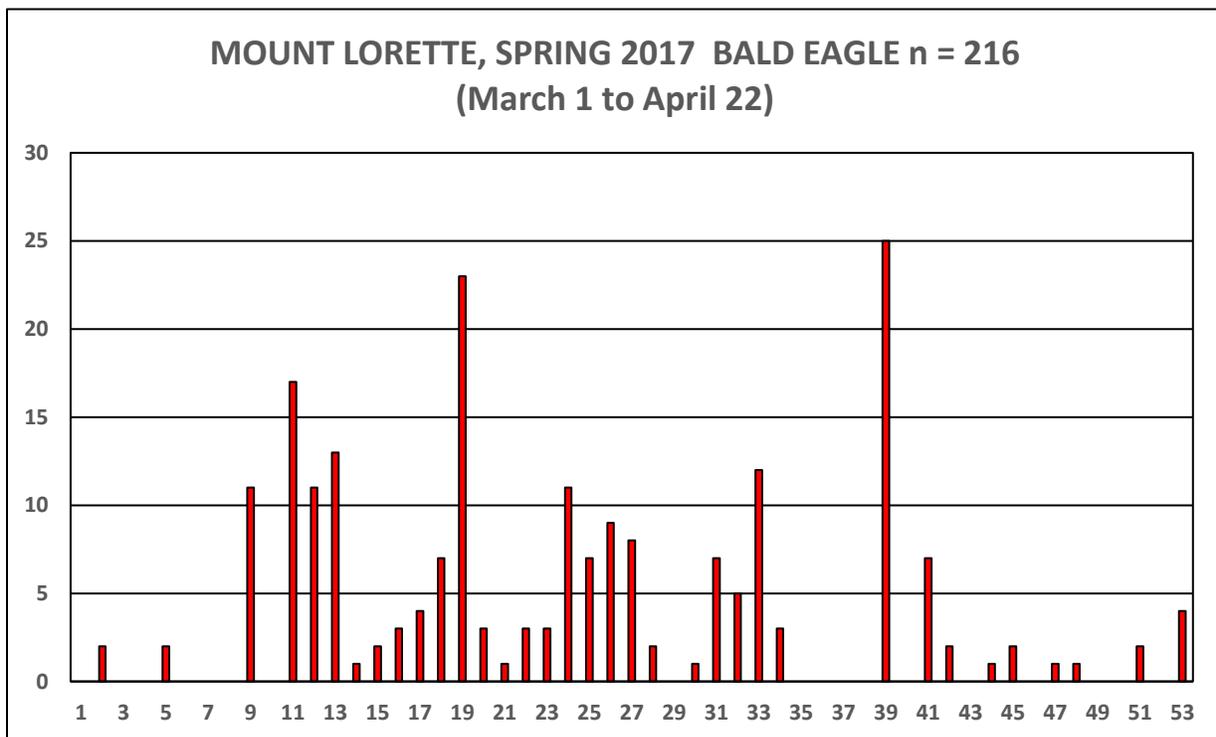


Figure 5

Other species

Turkey Vulture

Not recorded this season. The only previous records for the count period were single birds recorded on April 13, 1993, March 18, 2011 and March 31 2013, and 2 birds seen on April 10 2016.

Osprey

Not recorded this season. This is only the 4th time the species has not been seen on a spring count.

Northern Harrier

The total of 5 birds (2 adult males and 3 undifferentiated female/juvenile birds) was 4.2% above average. Birds moved on 5 days between April 2 and April 18. The median passage date for the species was April 13 which is coincident with the average date.

Sharp-shinned Hawk

For the fifth successive year it was another low count for the species with only 16 birds counted on 13 days between March 16 and April 22: the total is 35.5% below average. The highest daily count was 3 birds that occurred on April 16 which is 46.4% below the average high count. Two birds were counted in March, which is 20.0 % below average, and 14 in April which is 37.2% below average. The flight comprised 2 adults, 2 juveniles and 12 unaged birds. The species median passage date of April 16 is 4 days later than average.

Cooper's Hawk

A total of 9 Cooper's Hawks occurred on 5 days between April 1 and April 20, a total that is 33.3% above average. Four of the birds were seen on April 4, a maximum count that is 86% above average. The flight comprised 4 adults, 4 juveniles and 1 bird of indeterminate age, giving an age ratio of 1.0. The median passage date for the species was April 20, 7 days later than average.

Northern Goshawk

The total of 27 birds was seen on 17 days between March 20 and April 22 was 17.4% above average. The highest daily count was 3 birds on March 27, April 1 and April 16 which is 14.3% lower than the average single-day count. The flight comprised 16 adults, 3 juveniles and 8 birds of unknown age giving an age ratio of 0.18 which is 14.0% above average. The median passage dates for the species was April 7, 8 days later than average, and for adults was March 27, 1 day earlier than average.

Broad-winged Hawk

The total of 3 light morph birds (2 adults and 1 juvenile) seen on April 1 is the highest ever count at the site and this is only the fourth year that it has been recorded during the current count period. The previous records for the period were single birds seen on April 21 1994, April 13 1996 and April 19 2015.

Swainson's Hawk

Two adult birds (1 light morph and 1 rufous morph) seen on April 19 were the first ever recorded during the March 1 to April 22 count period.

Red-tailed Hawk

The total of 70 birds counted on 18 days between March 22 and April 22, was 145.2% above average and is by far the highest ever spring count for the site, the previous high count being 46 in 1999. The highest daily count was 21 on April 22 which is 311.8% above the average high count and is the highest ever single-day spring count at the site. The flight comprised 66 "Western Red-tailed Hawks" (*B.j.calurus*): 50 adult, 1 juvenile and 5 indeterminate light morphs, 2 adult and 1 juvenile rufous (intermediate) morphs and 5 adult, 1 juvenile and 1 indeterminate dark morphs; 1 juvenile "Kridler's Hawk" (*B.j.borealis* var *krideri*), and 3 adult dark morph "Harlan's Hawks" (*B.j.harlani*). The overall immature:adult ratio was 0.07 which is 29.6% above average. The median passage date of the species was April 14, 5 days later than average, and for adults was April 15, 7 days later than average.

Ferruginous Hawk

Not recorded this season. 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 23 birds were counted on 9 days between March 9 (12 days earlier than the average first occurrence) and April 22. The count is 18.9% higher than average. The highest single-day count was 7 on March 16, which is 20.7% above average. The median passage date of March 17 was 22 days earlier than average. The flight comprised 10 light morphs, 5 dark morphs and 8 birds of indeterminate morph.

American Kestrel

A total of 4 birds (1 male, 2 females and 1 bird of undetermined sex) were seen between April 4, which is the earliest occurrence of the species by 3 days, and April 18. The total is 321.1% above average and is the second highest count at the site behind the 5 counted in 2000. Two of the birds occurred on April 15.

Merlin

The total of 11 birds recorded on 6 days between March 11 and April 22 was 64.2% above average and equals the 3rd highest count for the site. All birds were of the race *F.c. columbarius* and comprised 3 adult males, three adult females and 5 birds of undetermined sex or age. The highest single-day count was 6 on April 22 which is the highest ever spring daily count and 287.1% above the average high count.

Gyrfalcon

Single birds were recorded on March 18, March 27 and April 22 with 2 birds described as black morphs and 1 as a white morph. The total is 150% above average and equals the high count along with 4 other years.

Peregrine Falcon

The total of 4 birds recorded on 4 days between March 27 and April 8 is a new spring high for the site and is 247.8% above average. Three of the birds were adult and 1 was of indeterminate age.

Prairie Falcon

A single bird was seen on April 1, a total that is 53.5% below average.

Observers

Principal Observers: Jim Davis (11 days), Blake Weis (11 days), Brian McBride (7 days), Joel Duncan (7 days), Bill Wilson (6 days), George Halmazna (6 days), Cliff Hansen (1 day), Caroline Lambert (1 day), Terry Waters (1 day).

Assistants: Caroline Lambert (10 days), Rick Robb (7 days), Lori Anderson (6 days), Fred Bowen (6 days), Ruth Morrow (5 days), Patrick Farley (4 days), Dan Parliament (4 days), Diane Stinson (4 days), Chris Hunt (3 days), Patricia Farley (1 day), Cliff Hansen (1 day), Heinz Unger (1 day).

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Beaver Mines extended reconnaissance count, 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 have commented in the daily blog on individual days when I have 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 were recorded 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 appears that this route is an important spring raptor flyway and not 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 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 (**Table 10**).

Spring 2017 is the second consecutive full count conducted from my house on 56 days (510.1 hours) between February 25 and April 22. The days and hours are 23.1% and 67.2% respectively higher than the 2015 and 2016 averages. 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: the total that is 3.9% higher than the average of the last 2 years. As with the last two years the count notably differs 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 compared to 7.5% (14 species) at Mount Lorette. The final count of 1994 migrant raptors was 2 Turkey Vultures, 10 Ospreys, 304 Bald Eagles, 70 Northern Harriers, 73 Sharp-shinned Hawks, 14 Cooper's Hawks, 72 Northern Goshawks, 1 unidentified *Accipiter*, 15 Broad-winged Hawks, 3 Swainson's Hawks, 214 Red-tailed Hawks, 7 Ferruginous Hawks, 68 Rough-legged Hawks, 17 unidentified *Buteos*, 1069 Golden Eagles, 3 unidentified eagles, 6 American Kestrels, 18 Merlins, 5 Gyrfalcons, 11 Peregrine Falcons, 9 Prairie Falcons, 1 unidentified falcon and 2 unidentified raptors (**Table 8**).

The weather is summarized in **Table 9**. Only one full day, March 9, was lost to poor weather. In contrast to the last two years that were characterized by significantly higher than normal temperatures throughout the count this year temperatures were generally below normal throughout and the period from March 7 to March 12 saw daytime highs between -6°C and -18°C , persistent snow and E-ESE winds which resulted in an almost complete cessation of raptor movement (**Figure 6**). For the rest of the count, however, moderate to strong SW-W winds were the norm, and snow and occasional rain occurred to the end of the count but, with the exception of April 12-15, these events were short-lived. The main movement was March 13 to 23 when 986 migrants were seen that included 738 Golden Eagles. The number of Golden Eagles quickly reduced but movement of other raptor species remained fairly strong for the rest of the count. The combined species median passage date was March 22, 2 days later than at Mount Lorette, and **Table 11** compares the median passage dates of individual species at Beaver Mines and Mount Lorette. It is apparent that most of the Golden Eagle movement takes place on ridges to the west of Beaver Mines, but the numbers and variety of the other raptor migrants made the count worthwhile but it probably not worth doing further systematic counts here.

Golden Eagle A total of 1069 birds were counted on 46 days between February 25 and April 22, of which 20 occurred in February, 929 in March and 120 in April. The total is 0.3% above the average of the last two years' counts. The highest single-day count was 154 on March 15 and other 100+ days were 145 on March 19 and 120 on March 16. The flight comprised 943 adults, 47 subadults, 42 juveniles and 37 unaged birds, giving an immature:adult ratio of 0.09 which is significantly lower than the 0.21 recorded at Mount Lorette, and is probably the result of the low April count. The March movement was 929 compared to 1070 in 2015 and 831 in 2016, and the April count of 120 compares to 99 in 2015 and 132 in 2016. In general the flight dynamics of the last three years are very similar and the relatively low percentage of the migratory Golden Eagle population seen probably makes the site unsuitable for long-term monitoring of the species. The median Passage dates for the species, adults and immature birds were March 18, March 17 and April 2 respectively, compared to March 20, March 20 and March 26 at Mount Lorette.

Bald Eagle The Bald Eagle count of 304 on 44 days between February 27 and April 22 was 31.9% higher than the average of the last 2 years. Three birds were seen in February, the March count was 228, and 73 moved in April with a single-day high count of 33 on March 13. The flight comprised 235 adults, 22 subadults and 45 juveniles with an immature:adult ratio of 0.29, which is very similar to the Mount Lorette ratio of 0.3. The median Passage dates for the species, adults and immature birds were March 23, March 23 and March 20 respectively, compared to March 24, March 23 and March 26 at Mount Lorette.

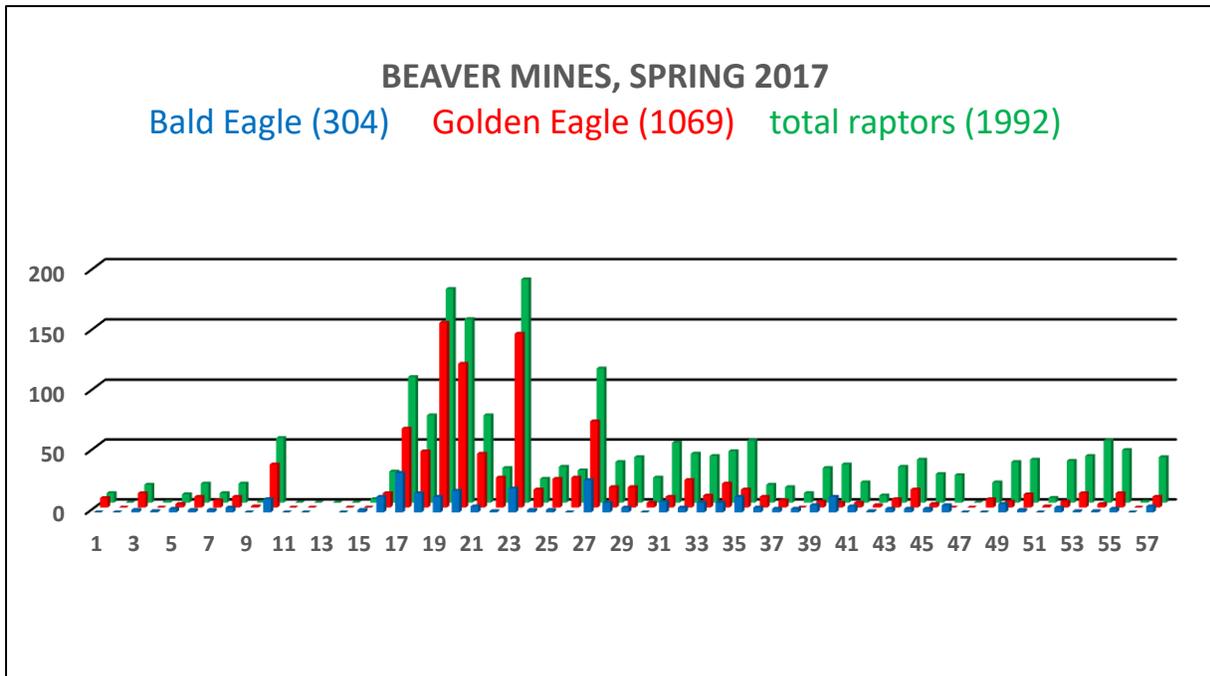


Figure 6

Turkey Vulture A single Turkey Vulture of indeterminate age seen on March 1 is the earliest record by far on a RMERF raptor count. An adult bird on April 11 was more expected.

Osprey This was the only species not recorded on the count in 2016, but this year 10 birds were counted on 8 days between April 5 and April 22 with 2 birds seen on April 14 and 15. The species median passage date was April 14.

Northern Harrier A total of 70 migrants were counted on 23 days between March 14 and April 22 comprising 42 males (37a, 2j and 3 indeterminate), 20 females (18a and 2 indeterminate) and 8 birds of unknown sex or age. The March count was 16, 54 were seen in April, and the highest single-day count was 12 on April 17. The count is 27.3% higher than the average of the last 2 years. The median passage date for both the species and for adults was April 17.

Sharp-shinned Hawk a total of 73 birds were counted on 27 days between March 13 and April 20, with a single-day high count of 11 on April 11. The count is 7.6% below the average of the last two years. The flight comprised 24 adults, 4 juveniles and 45 unaged birds. Twenty-three birds were seen in March and 50 in April. The median passage date for the species was April 11 and for adult birds was April 4.

Cooper's Hawk The count of 14 birds comprised 9 adults and 5 unaged birds. Birds occurred on 10 days between March 19 and April 22 with a single-day high count of 3 on April 20. Three birds were seen in March and 11 in April. And the count is 15.2% below the average of the last two years. The median passage date for the species was April 10 and for adult birds was April 17.

Northern Goshawk A total of 72 Northern Goshawks were counted on 31 days between March 2 and April 22, with a single-day high count of 10 on March 19. The count is 24.1% above the average of the last two years. Unlike the other two *Accipiter* species 46 (63.9%) goshawks moved in March and 26 in April. The flight comprised 44 adults, 9 juveniles and 19 unaged birds giving an age ratio of 0.2, and the median passage dates of the species, adults and juvenile birds were March 24, March 21 and April 9 respectively.

Broad-winged Hawk A total of 15 birds were counted on 7 days between the very early date of March 31 and April 22. The count is 200% above the average of the last two years. The 3 unaged light morph birds that were seen on March 31 were probably the same as the 3 light morph birds (2 adult, 1 juvenile) that were recorded at Mount Lorette the following day. The flight comprised 14 light morph birds (5 adults and 9 unaged) and 1 adult dark morph bird. The highest single day count was 6 on April 20, the median passage date of the species was April 19, and for adult birds April 10.

Swainson's Hawk Three single birds were seen: 1 very early adult light morph on March 21, 1 adult dark morph on April 15 and 1 indeterminate light morph on April 20. The total is coincident with the average count for the last two years.

Red-tailed Hawk The total of 214 birds counted on 36 days between March 13 and April 22 was 7.4% below the average of the last two years. Ninety-eight birds occurred in March and 116 in April, with a single-day high count of 21 on March 27. The flight comprised 202 "Western" Red-tailed Hawks (*B.j.calurus*): 170 light morphs (141 adults, 5 juveniles, 24 indeterminate) and 32 dark morphs (28 adults, 4 indeterminate); 7 adult dark morph "Harlan's" Red-tailed Hawks (*B.j.harlani*); and 5 indeterminate birds. The overall immature:adult ratio was 0.03 and the median passage dates of the species, adults and juvenile birds were April 4, April 4 and April 9 respectively. The median passage date for *calurus* was April 4 and *harlani* was 8 days earlier on March 26.

Ferruginous Hawk Seven light morph birds (6 adults and 1 indeterminate) were counted on 6 days between March 23 and April 20. The count is 55.6% above the average of the last two years. The median passage date for the species was April 14.

Rough-legged Hawk A total of 68 birds comprising 55 light morphs, 12 dark morphs and 1 unknown morph gave a dark:light ratio of 0.22. Birds occurred on 29 days between March 2 and April 19, with a highest single-day count of 15 on March 17. Fifty-four birds moved in March and 14 in April, and the median passage date was March 17.

American Kestrel A total of 6 adult birds, 2 males, 2 females and 2 of indeterminate sex were recorded on 6 days between March 29 and April 22. The total is 53.8% below the average of the last two years. The median passage date was April 13.

Merlin A total of 18 Merlins were recorded, 17 of the race *F.c.columbarius* comprising 9 adult males, 3 adult females and 5 birds of undetermined age or sex; and 1 female/juvenile bird of the race *F.c.richardsonii*. The total is 24.1% above the average of the last two years. The birds were counted on 13 days between March 6 and April 19, with 9 of the birds moving between March 14 and 17 with a single day high count of 3 on March 16. The median passage date for the species was March 17 and for adult birds March 16.

Gyrfalcon Five birds were counted on 4 days between February 3 and April 15, with 2 birds occurring on March 14, which was also the median passage date of the species. The total is coincident with the average of the last two years. The flight comprised 4 grey morph birds (3 adult males and 1 juvenile) and 1 adult female white morph on March 14.

Peregrine Falcon As with last year 11 Peregrine Falcons were counted that occurred on 7 days between March 28 and April 20. The total is 69.2% above the average of the last two years. Two birds occurred on each of April 14, 15 and 20. The flight comprised 7 males (6 adults and 1 juvenile), 3 adults of unknown sex and 1 indeterminate bird. The median passage date for the species was April 15 and for adults April 14.

Prairie Falcon Nine birds were seen on 9 days between March 6 and April 6. The median passage date for the species was March 26.

Completing the count of 1994 birds were 1 small unidentified *Accipiter*, 17 unidentified *Buteos* (4 light, 8 dark and 5 indeterminate), 3 unidentified eagles, 1 unidentified falcon and 2 unidentified raptors.

Table 11 summarizes the median passage data for both the Mount Lorette and Beaver Mines sites.

Further details of this count can be found on the spring 2015 blog on our website:
www.eaglewatch.ca.

Acknowledgements All counts were conducted by Peter Sherrington except for March 20 when the count was conducted by Denise Cocciolone-Amatto, assisted by Pat Lucas, Nel van Kamer and Marilyn Liddell. Assistance was also provided on other occasions by Denise Cocciolone-Amatto (6 days), Gord Petersen (3 days), Doug and Teresa Dolmen, Phil Hazelton, Pat Lucas and Cathy Scrimshaw (1 day).

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) 25 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 giving the possibility of simultaneously monitoring movement along the eastern and western flanks of the Rocky Mountains at 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 2017 was the eighth spring count there (**Table 13**).

During the spring 2017 season, because of teaching commitments, Vance was only able to conduct a 15-day (69.5 hour) reconnaissance count out of a possible 40 days between March 1 and April 8 after which the count was abandoned for the season (**Table 12**). The days and hours are the lowest ever for a spring count and are 45.5% and 58.2% lower than the average for the last 5 years respectively.

Seven days observation was conducted at the Bull Mountain site, 7 days were at or near the Bill Nye site and 1 day was spent at the South Lakit Lake. Between 1.7 and 7 hours at an average of 4.6 hours a day were spent at the sites with most observations conducted between 1100 and sundown (**Table 12**).

Details of the sites are as follows:

Bull Mountain (49° 29' 57"N, 115° 23' 57"W, 917m) The site monitors the most southerly peak of the Steeples Group and is accessed by the Bull River Forest Service Road that is a turn off from the Wardner-Fort Steele Road. Because of its relatively low elevation and its proximity to a dam, which results in the road being maintained in the winter, the site is used when access to other sites is impossible because of snow and ice.

Bill Nye (Scarface) (49° 45' 11.10"N, 115° 38' 49.14"W, 1041m) The Scarface site (named after a prominent 'scar' on the face of the mountain) is a convenient option from Wasa Lake. Following Lazy Lake Road east toward Lazy Lake, the site is located south of an unmarked back road approximately 10 km from the Lazy Lake Road turn off on Wasa Lake Park Drive on the southern edge of Wasa Lake. The site is located about 5 km southeast from the back road turnoff, although it may require detailed instructions to arrive there. The site offers views of the birds as they pass over, or in front of, the ridge. 'Scarface Peak' (2400m) is the most westerly and visibly craggy peak of Mount Bill Nye (2600m).

South Lakit (49° 35' 45.45"N, 115° 35' 30.50"W, 1080m) The South Lakit Site is located approximately 6km north on the Fort Steele-Wildhorse Forest Service Road and is accessed from Wardner-Fort Steele Road. The Wardner-Fort Steele Road joins Highway 93 near Wardner in the southeast to Highway 93 near Fort Steele in the northwest. This road also runs along the east side of the Kootenay River with the Steeples Ridge (the location of the Steeples Site) immediately to the east. The Wildhorse Forest Service road is located just east of the Fort Steele Gas Station at the junction of Highway 93. The site itself is located off the Wildhorse Road, and sits at the southern base of the Lakit Range, with Lone Peak to the SSE and the Steeples Range commencing just beyond this point.

Weather

Five days of potential viewing (March 3, 5, 18 and April 7 and 9) were completely lost to adverse weather conditions when the ridges were obscured on heavily overcast days, and a further 20 days were missed owing to work commitments. Hourly weather data were not gathered but daily weather summaries were produced. (**Table 14**).

General flight dynamics

Despite reduced observation time the high totals were in part due to a weather pattern that saw heavily overcast skies during the week, that tended to clear from Thursday to Sunday (the period in which consistent observation could occur). This fortuitous pattern occurred during the weeks of March 07 and 14, that created a bottleneck effect and produced waves of migrating eagles during the observation periods. These coincided with the peak movement days of 94 migrants on March 12, and especially 147 on March 17 (that equaled the spring site record of March 18, 2010, and set a new spring site record for Golden Eagles of 133), and 104 migrants on March 19.

As in previous years, the period of March 17 to March 22 continues to produce the most concentrated raptor movement.

Another aspect of the 2017 count was that owing to heavy snowfall throughout the winter, access to the Bill Nye/Scarface site was largely blocked until March 21st, making the primary site for the count the south end of Bull Mountain along the Steeples range. However, whether the location was in any way responsible for a higher numbers of migrant eagles is unknown and perhaps unlikely.

Count Summary

Despite the low number of observation days the count produced a total of 515 migrant raptors of 8 species (**Table 12**). Of this total 386 (75.0%) were Golden Eagles and 110 (21.4%) were Bald Eagles. Eagle species together comprised 96.3% of the total flight which is close to the 92.5% of eagles recorded at Mount Lorette, although there Golden Eagles (2256) greatly outnumbered Bald Eagles (216). Other migrants at Steeples were scarce and comprised 3 adult Turkey Vultures, 3 Sharp-shinned Hawks (1a and 2 indeterminate), 4 Red-tailed Hawks (3 adult light morph *calurus* and indeterminate bird, 1 light morph Rough-legged Hawk, 1 male American Kestrel, 1 adult male *columbarious* Merlin and 6 unidentified eagles. The migration rate of 7.41 raptors/hour is a record and is 107.3% above average. The results of all eight spring counts at the site are summarized on **Table 13**.

Bald and Golden Eagles

A total of 110 Bald Eagles was recorded on 9 days (60%) with a single-day high count of 30 on March 12, and 4 other days had double-digit counts. Despite the limited observation time this total is only 17.0% below the 2010-2016 average. The flight comprised 61 adults, 7 subadults and 42 juveniles, giving an immature:adult ratio of 0.8 which, as usual, is much higher than the ratios of 0.3 at Mount Lorette and 0.29 at Beaver Mines.

The 386 migrant Golden Eagles were recorded on 10 of a possible 15 active field days (66.7%) with a highest single day count of 133 on March 17, which is a spring record for the site, followed by the second highest count of 89 on March 19. Again, despite the limited observation time this total is 28.5% above the 2010-2016 average and is the 3rd highest spring count for the site. Six days (40%) had double-digit counts this season. The flight comprised 344 adults, 9 subadults and 33 juveniles giving an immature:adult ratio of 0.12, which compares to a ratio of 0.21 at Mount Lorette and of 0.09 at Beaver Mines.

Principal Observer at Steeples

All counts were conducted by Vance Mattson.

Comparison of three sites by raptor categories

Percentage of raptor categories at the three sites spring, 2017			
	Mount Lorette	Steeple	Beaver Mines
Turkey Vultures	0	0.58	0.1
Ospreys	0	0	0.5
Northern Harrier	0.19	0	3.5
Eagles	92.5	96.3	69.0
<i>Accipiters</i>	1.95	0.58	8.02
<i>Buteos</i>	2.99	0.97	16.24
Falcons	0.94	0.39	2.6

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 occurred 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.

Appendix (separate attachment)

List of Tables

Table 1 Mount Lorette: Daily count numbers, spring 2017

Table 2 Mount Lorette. Summary of spring counts 1992-2017

Table 3A Mount Lorette. Summary of spring counts 1993-2015, March 01-April 22 (all counts)

Table 3B Mount Lorette. Summary of spring counts 1993-2015, March 01-April 22 (excluding 2008-2010 and 2012)

Table 4A Mount Lorette. March summary totals 1993-2017, March 01-April 22 (all counts)

Table 4B Mount Lorette. March summary totals 1993-2017, March 01-April 22 (excluding 2008-2010 and 2012)

Table 5A Mount Lorette. April summary totals 1993-2017, March 01-April 22 (all counts)

Table 5B Mount Lorette. April summary totals 1993-2017, March 01-April 22 (excluding 2008-2010 and 2012)

Table 6 Mount Lorette. Summary weather data, spring 2017

Table 7 Mount Lorette hourly Golden Eagle counts spring 2017

Table 8 Beaver Mines. Daily count numbers, spring 2017

Table 9 Beaver Mines. Summary weather data, spring 2017

Table 10 Beaver Mines. Summary of spring counts 2014-2017

Table 11 Median passage dates spring 2017, Mount Lorette and Beaver Mines

Table 12 Steeples. Daily count numbers, spring 2017

Table 13 Steeples. Summary of spring counts 2010-2017

Table 14 Steeples. Summary weather data, spring 2017

