

MOUNT LORETTE, SPRING 2013

With notes on the Steeples, BC site

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Summary and highlights

This was the 22nd consecutive year that a spring count has been held at Mount Lorette, and is the 6th consecutive extended (as opposed to complete) count at the site. As started in 2011 the count period was again March 1 to April 22. The combined species count of 2607 birds was the second highest since 2007, as was the Golden Eagle count of 2389. Poor weather in April contributed to lower than predicted counts for juvenile Golden Eagles and most non-eagle raptor species. A fourth extended spring reconnaissance count at Steeples Ridge in BC on the western flanks of the Rocky Mountains near Cranbrook, BC, also experienced poor weather in April that produced similar outcomes.

Introduction

The Mount Lorette site is located in the Kananaskis Valley in the Front Ranges of the Rocky Mountains (50°58'N 115°8'W) 70 km due west of Calgary and immediately north-east of the Nakiska Ski Hill on Mount Allan. At this point the valley trends north-south and cuts obliquely across the NW-SE oriented trend of the Front Ranges. To the east of the observation site the Fisher Range has an average elevation of about 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 about 1433m. The site allows 360° views of the surrounding mountains and allows monitoring of raptors moving along the mountain ridges to the east and west, and especially those crossing the valley between Mount Lorette and the north end of the Fisher Range. The site is unique in that it allows observation of approximately the same high percentage of a population of migratory Golden Eagles both in spring and fall at exactly the same site, which has in the past been occupied for up to 190 days in a year. When downslope cloud obscures these mountains an alternate site at Lusk Creek, 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 that 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 being 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 the Crownsnest Pass in SW Alberta, during which time extended comparison counts were conducted at Mount Lorette during the main period of Golden Eagle migration. The Lorette counts in 2006, 2007 and 2008 were conducted between March 01 and April 15 and comprised 44 days, 46 days and 48 days of active observation respectively. **Table 1** summarizes all the spring counts since 1993 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 3** summarizes the counts conducted at Mount Lorette for the period March 1 to April 22 (excluding 2008, 2009, 2010 and 2012). This report gives data variances of the current count (number, median passage dates, age ratios) for the period March 01-April 22 with averages for the same period of the 16 years 1993-2007 and 2011. (For comparison, **Table 2** gives the variances of the 2013 count with the averages of the twenty counts conducted at the site from 1972 to 2012.)

Once again because of logistical considerations no count was held this season at the Piitaistakis-South Livingstone site, and so this report concerns only the count at Mount Lorette and the extended 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 49 days (537.4hours) of a possible 53 days at the site between March 01 and April 22, the days and hours being 1.4% and 2.1% below average respectively. At the Steeples reconnaissance count in BC Vance Mattson spent 25 days (83.0 hours) of a possible 46 days at the site between March 1 and April 15. This is the fourth consecutive spring season that this count has been held.

Mount Lorette, Alberta

Weather

Table 6 summarizes the weather data from this season's count. In general the weather during March and the first two days of April was more clement than it has been in recent years, but it subsequently deteriorated and severely curtailed the numbers of migrants observed during the latter part of the count. A total of 3 days were completely lost to adverse weather with heavy snow on March 3, April 3 and April 7. One day, March 8, was also lost owing to the lack of an observer. A further two days (March 7 and 22) were significantly shortened because of the weather, and persistent snow on April 11, 13-16 and 20 prevented raptor movement, although the site was occupied on each of these days. A total of 13 active observation days (26.5%) experienced snow (excluding light flurries) and a further day was impacted by rain. The lowest minimum temperature recorded at the site was -22°C on March 5 and 24, and the highest temperature was 14°C on April 1 and 2. The temperature failed to rise above freezing on 15 active days (30.6%), 10 in March and 5 in April, and in general the temperatures were cooler than normal, especially in April. Regrettably, once again the Environment Canada weather station (Nakiska Ridgetop) situated 4 km west of the Hay Meadow site on Olympic Summit (Mount Allan) at 2543 m was mainly inoperative this season 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, and on cloudless days or when the ridges were cloaked in cloud estimating the wind direction proved to be impossible. Observers assessed ridge winds to be from the SSW-W 63.3% of the time, from the WNW 12.2%, from the NW to the NE 6.1% and variable 2% of the time. On 8 days (16.3%) observers could not assess the ridge winds, usually because of persistent snow. On active observation days ridge wind speeds were assessed as moderate to strong (11-41+ km/h) 28.6% of the time and strong (>41 km/h) for 16.3% of the time. Moderate winds (11-40 km/h) occurred on 12.2% of active days, light to moderate (1-40 km/h) winds occurred 22.4% of the time while light winds (<10 km/h) occurred 12.2% of the time. On four days (8.2%) conditions prevented assessment of wind velocity. Overall, wind velocities and directions were close to normal, although the number of days assessed as light were above average. Four days (March 24, 25, April 17, 22: 8.2%) experienced cloudless or near cloudless conditions all day while, 12 active days (24.5%) experienced cloud cover between 80 and 100% all day. A total of 30 days (61.2%), experienced 100% cloud for at least part of the day, but overall the cloud cover was somewhat less than average. The eastern ridge system (Fisher Range and Mount Lorette) was at least partly obscured on 24 active days (49%), and 40-100% obscured on 21 active days (42.9%) which is much higher than average. Thirteen of 22 days in April saw the eastern route 40-100% obscured.

General flight dynamics March 1 to April 22

A total of 2607 migrant raptors of 12 species were counted on 49 active observation dates between March 1 and April 22 (**Tables 3 and 7**). The combined species total was 24% below the long-term average for the period March 1 to April 22 at the site. Including the 3 days lost because of weather, a total of 9 days had no raptor passage, and a total of 23 days (46.9%) in the count period had counts of 10 birds or less. The first 7 days of the count yielded only 6 birds although viewing and migration conditions appeared to be reasonable. The first significant movement (24 birds) did not occur until March 9, although it is likely that movement started the previous day when the lack of an observer meant that no count could be conducted. Movement continued to be steady and the first 100+ day (102) occurred on March 16, and 115 and 169 birds moved on March 18 and 19 respectively. Peak movement occurred on four days between March 23 and 26 which saw the passage of 1285 migrants of which 1263 (98.3%) were Golden Eagles. The highest single day count was 365 (359 Golden Eagles) on March 26. Migration remained fairly strong until the beginning of April, after which it became very sporadic as the weather deteriorated. The March combined species total of 2346 represented 90% of the total spring 2013 count, and was only 0.24% below the average of all March counts at the site (**Table 4**), but almost 13% below the average of the previous 16 valid counts at the site (**Table 5**). After the 55 birds counted on April 5 only three more days saw double-digit movement, but the count of 36 birds on April 21 was notable for the passage of 19 Rough-legged Hawks which is a single-day spring record for the site. The combined species median passage date was March 24 which was 1 day later than the long-term average (1993-2007, 2011). Of the 14 species that regularly occur during the period (**Table 3**) only Rough-legged Hawk (27 : +57.7%) had a count that was significantly above the long-term average; and a single Turkey Vulture on March 31 was only the third spring record for the period at the site. Merlin (7: -0.9%) and Peregrine Falcon 1: 0.0%) were average, but all other species were well below average, reflecting the paucity of the April count: Bald Eagle 104 (-46.7%), Northern Harrier 2 (-57.3%), Sharp-shinned Hawk 17 (-36.6%), Cooper's Hawk 1 (-86.4%), Northern Goshawk 13 (-45.4%), Red-tailed Hawk 18 (-36.4%), Golden Eagle 2389 (-23%) and Prairie Falcon 1 (-57.9%). Osprey, Broad-winged Hawk, Ferruginous Hawk, American Kestrel, and Gyrfalcon were not recorded this year, while Swainson's Hawk has never been recorded at the site during the current count period. The final count was Turkey Vulture 1, Osprey 0, Bald Eagle 104, Northern Harrier 2, Sharp-shinned Hawk 17, Cooper's Hawk 1, Northern Goshawk 13, *Accipiter* sp. 10, Broad-winged Hawk 0, Swainson's Hawk 0, Red-tailed Hawk 18, Ferruginous Hawk 0, Rough-legged Hawk 27, *Buteo* sp. 10,

Golden Eagle 2389, eagle sp. 4, American Kestrel 0, Merlin 7, Gyrfalcon 0, Peregrine Falcon 1, Prairie Falcon 1, *Falco* sp. 1, indeterminate raptor 1, for a total of 2607 migrant raptors. Detailed daily summaries of weather and flight dynamics can be found on the spring 2013 blog on the RMERF website www.eaglewatch.ca

Golden Eagle

Observers counted a total of 2389 migrating Golden Eagles on 37 days between March 5 and April 22, with the highest single-day count of 359 occurring on March 26 (**Figure 1**). The number of days on which it was recorded is 18.7% below average and is the lowest ever for valid counts at the site. The total is 23% below the long-term average and the high count is 11.2% below average. Four other days also had counts of over 100 birds: March 25 (344), March 23 (287), March 24 (273) and March 19 (167). The March count of 2216 was only 0.18% below the average of all counts at the site (**Table 4**), but when the anomalously low counts are excluded the figure rises to -13.12% (**Table 5**). The flight comprised 1670 adults, 121 subadults, 84 juveniles, 8 undifferentiated immature birds and 501 birds of unknown age yielding an immature:adult ratio of 0.13 which is 51.2% above average. The low number of juvenile birds relative to the number of subadults birds may reflect the poor April passage where only 173 Golden Eagles were recorded. Most juvenile passage occurs in April at the site.

MOUNT LORETTE, SPRING 2013 GOLDEN EAGLE n = 2389

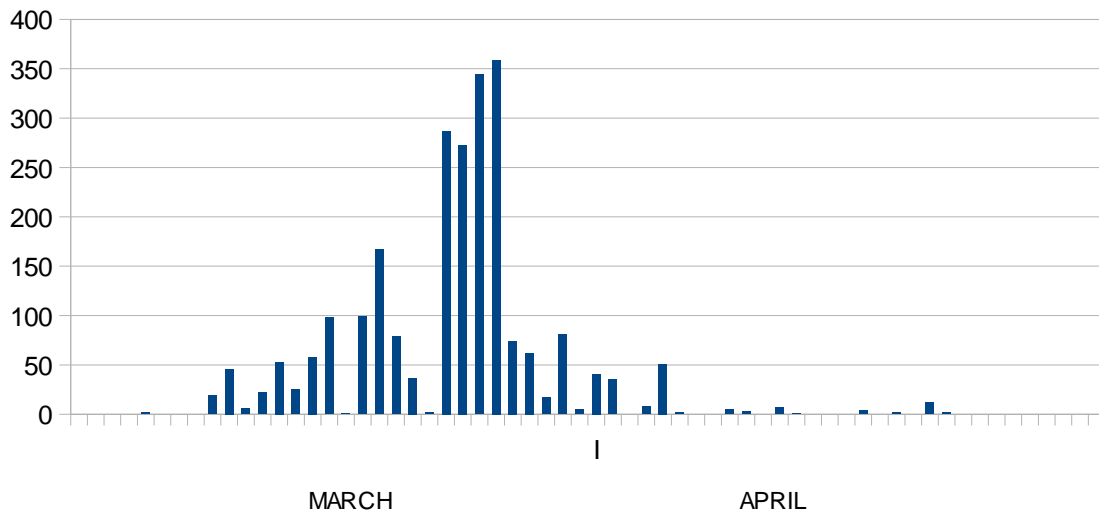


Figure 1

The hourly cumulative counts (**Figure 2**) differ significantly from the long-term average positively-skewed normal distribution curve where hourly counts steadily increase throughout the day, peak around 1600 and fall thereafter. This season's chart shows a rather flat profile between 1200 and 1800 with a dip between 1300 and 1400. The highest cumulative hourly counts (all times are Mountain Standard Time) were 319 from 1200 to 1300, 296 from 1600 to 1700, 290 from 1500-1600 and 282 from 1700 to 1800. Twelve birds were recorded before 0700 while 131 occurred after 1800 but none after 1900. The only hour that yielded over 100 birds was 1200-1300 on March 23 (107), and the second highest count was 95 birds between 1700 and 1800 on March 25.

MOUNT LORETTE, SPRING 2013 GOLDEN EAGLE n = 2389

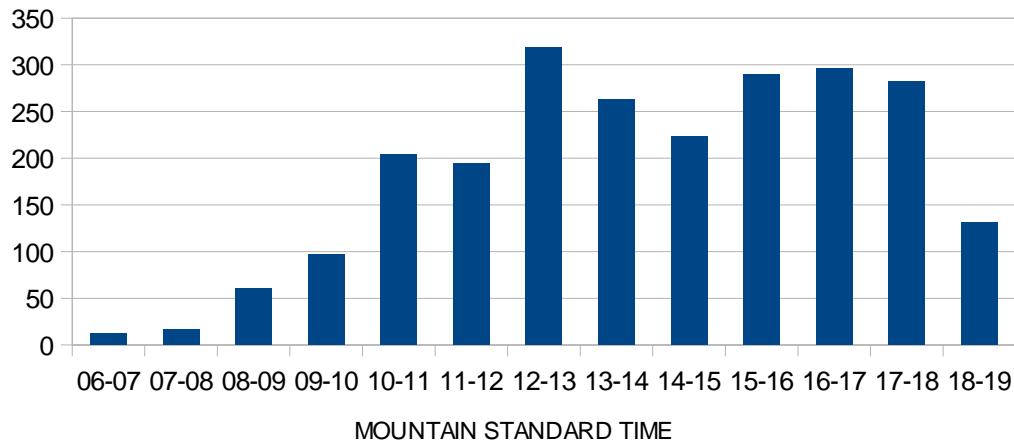


Figure 2

The median passage date for the species and for adult birds was March 24, both of which were 2 days later than average. The median passage date for immature birds was March 25 which is by far the earliest ever at the site and 15 days earlier than average. This obviously reflects the low numbers of immature birds, and especially juveniles, recorded in April.

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 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 a significant decline over the last 20 years (and especially since 1995) and removal of the recent anomalous low counts (**Figure 3B**) only slightly tempers but does not change this trend, as does the removal of the demonstrably weather-affected counts in 1997 and 1999 (**Figure 3C**).

Last year almost 140,000 Golden Eagle records from our sites were entered into the University of Calgary-based initiative called the Geospatial Cyberinfrastructure for Environmental Sensing (GeoCENS), a web-based portal for sharing scientific data related to climate, water and wildlife. These data are presently the basis of thesis research being conducted at the University of California, Los Angeles⁵. This study has evaluated the quality of the data gathered over the last two decades, and should establish the statistical significance of the trend observed at Mount Lorette.

In the meantime the future of this population of migratory Golden Eagles should still be of serious concern.

MOUNT LORETTE, GOLDEN EAGLE, SPRING COUNTS March 01 to April 22

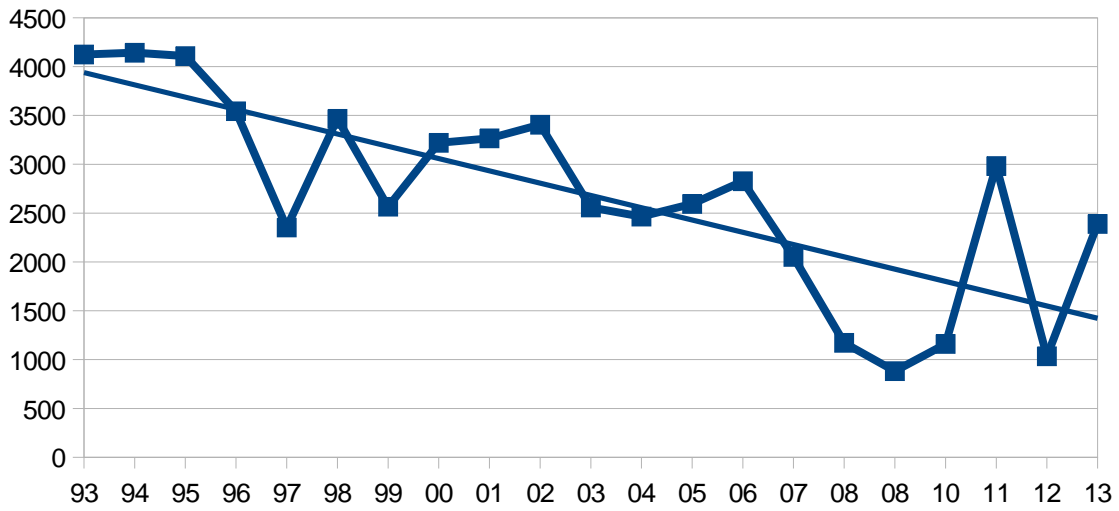


Figure 3A

MOUNT LORETTE, GOLDEN EAGLE, SPRING COUNTS March 01 to April 22

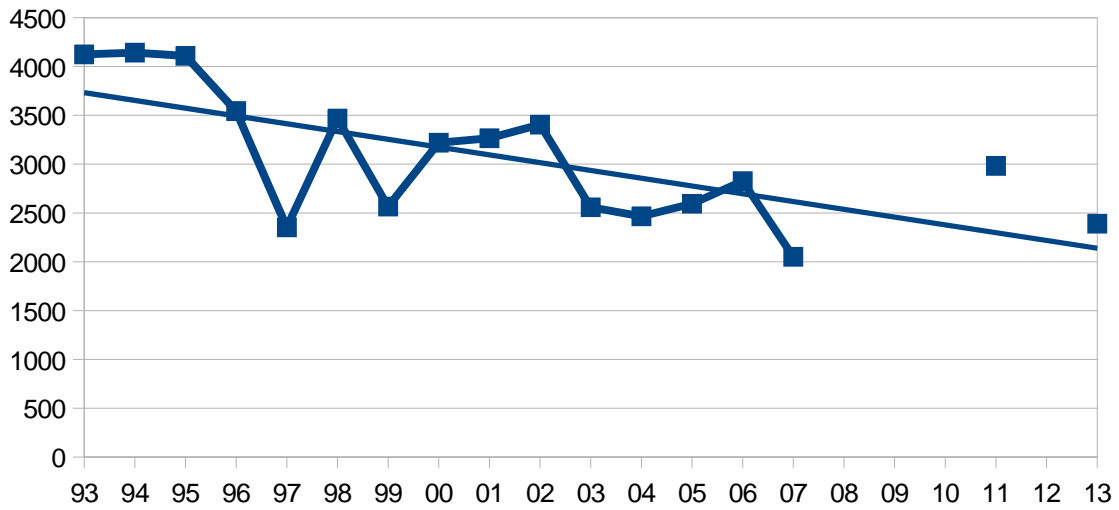


Figure 3B

MOUNT LORETTE, GOLDEN EAGLE, SPRING COUNTS, March 01 to April 22

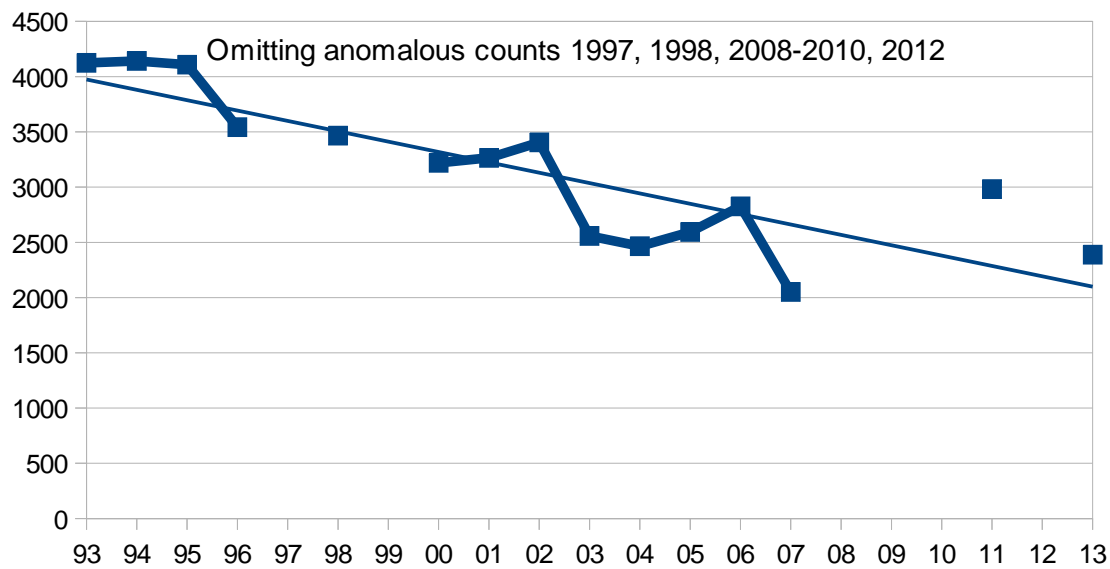


Figure 3C

Golden Eagle Age Analysis

Figure 4 shows the ratio of immature and adult Golden Eagles from 1994 to 2013. This is based on a combination of Mount Lorette and Piitaistikis-South Livingstone data as contemporaneous counts from both sites show a close correlation of ratios. The upper (blue) series show fall data, the lower (red) 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 a more diffuse migration pattern of young birds in the spring. It is also accentuated by the shorter count period which undercounts the number of juvenile birds, many of which move after April 22. The spring 2013 count probably illustrates this phenomenon. 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 (1992, although age data from the first years there 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 two, more or less, eight-year cycles have occurred during the life of the project so far. Many immature Golden Eagles (subadults and juveniles) move north in 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 2012 count suggested that breeding success is increasing again with numbers beginning to rise towards the next peak which is expected to be around 2016. Data from the 2013 count suggest that this trend has been reversed, but it is probably more a reflection of the low April count, which is also shown by the anomalously high ratio of subadult to juvenile birds.

MOUNT LORETTE, GOLDEN EAGLE immature:adult age ratios 1994-2013

blue (upper) fall; red (lower) spring

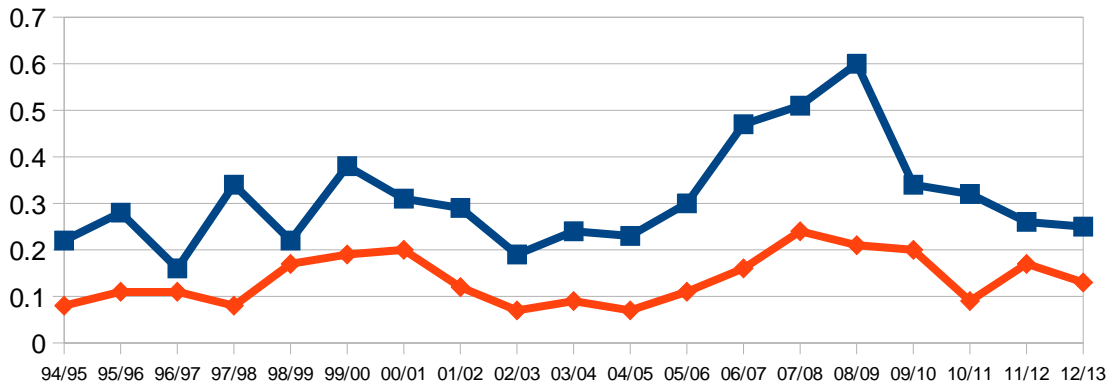


Figure 4

Bald Eagle

Observers counted only 104 Bald Eagles on 28 days between March 1 and April 22 (**Figure 5**). This was the lowest ever spring count at the site if the anomalously low combined-species counts of 2008 (86), 2009 (76), 2010 (88) and 2012 (91) are excluded. The count is 40.0% below the long-term average of all counts, and 46.7% below the average excluding 2008-10 and 2012. The highest daily count was 14 on March 18 which is 36.9% below the average high count (excluding low counts) for the period. The flight comprised 71 adults, 7 subadults, 18 juveniles 6 undifferentiated immature birds and 2 birds of unknown age giving an overall immature:adult ratio of 0.3 which is 14.1% below the long-term average ratio. The median passage date for the species was March 21, eight days earlier than average; adult birds were 4 days earlier than average on March 27 and immature birds were 11 days early on March 21. These dates may also reflect the relatively low April count of only 30 birds.

MOUNT LORETTE, SPRING 2013 BALD EAGLE n = 104

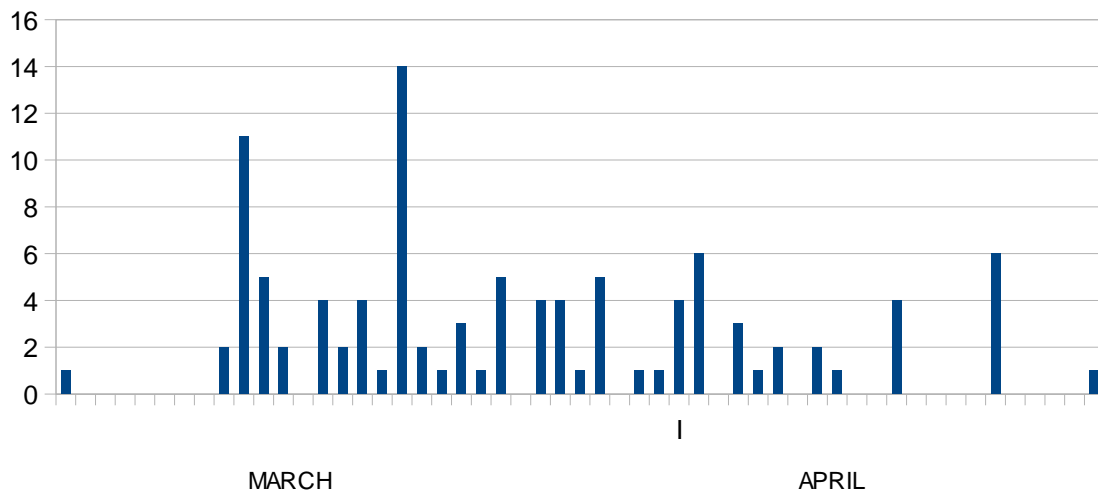


Figure 5

Other species

Turkey Vulture A single adult bird recorded on March 31 was only the third record for the count period. Previous records were single birds recorded on April 13, 1993 and March 18, 2011.

Osprey

The species was not recorded this year. The only other years that it has not occurred were the anomalous counts from 2008 to 2010, when the weather in April was also poor. The average count at the site is only 2 birds.

Northern Harrier

Only two birds, an adult male on April 21 and a bird of unknown sex or age on April 18, were recorded. The total is 57.4% below the average count for the period.

Sharp-shinned Hawk

This season continued the run of low counts for the species at the site since 2007 with the count of 17 birds on 9 days between March 2 and April 22 being 36.6% below average. The bird seen on March 7 was exceptionally early and 24 days earlier than the average first occurrence date. The highest daily count was only 3 birds on April 19. The flight comprised 8 adults, 2 and 9 unaged birds and the median passage date for the species was March 29, fifteen days earlier than average, which again results from the low April count.

Cooper's Hawk

Only one Cooper's Hawk was seen: an adult bird on April 12.

Northern Goshawk

The total of 13 birds seen on 11 days between March 6 and April 10 was 45.4% lower than average. The flight comprised 12 adults and 1 bird of unknown age. The median passage dates for both the species and for adults was March 26, which are four and one day later than average respectively.

Broad-winged Hawk

Not recorded this season. The only previous records for the period were single birds seen on April 21 1994 and April 13 1996.

Swainson's Hawk

This late migrant has never been recorded during this count period.

Red-tailed Hawk

After the last two years produced counts of 45 and 52 birds, this year's count of 18 birds was disappointing. The birds were counted on 14 days between March 9 (15 days earlier than the average first occurrence) and April 22, and the total was 36.4% below average. The highest daily count was only two, which occurred on four days. The flight comprised 17 adult "Western Red-tailed Hawks" (*B.j.calurus*): 12 light morphs, 2 rufous (intermediate) morphs and 4 dark morphs, and 1 adult "Krider's" Red-tailed Hawk (*B.j.borealis* var *krideri*), a bird that is only rarely recorded at the site. The combined immature:adult ratio was 0.0 The median passage dates of both the species and of adults was April 9. This is coincident with the long-term average for the species and two days later than average for adult birds.

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

Observers counted a total of 27 birds on 6 days between March 23 (2 days later than average) and April 22 (3 days later than the average late bird, and the last day of the count). The total is 57% above average and the highest daily count was 19 birds on April 21, which is the highest ever single-day count at the site and 270.7% above the average high count. Not surprisingly the median passage date for the species was also April 21 which is 12 days later than average. The flight comprised 24 light morph, 1 dark morph and 2 birds of undetermined morph.

American Kestrel

Not recorded this year. It has been recorded in the count period on 11 of the previous 20 years.

Merlin

The total of seven birds counted on seven days between March 9 (12 days earlier than the average first occurrence) and April 18 was just below average (-0.9%). All birds were assigned to the race *columbarius* and comprised 5 adult males, 1 adult female and 1 bird of indeterminate age and sex. The median passage date for the species was April 10, 5 days later than average.

Gyrfalcon

Not recorded this year. It has been recorded in the count period on 13 of the previous 20 years.

Peregrine Falcon

A single adult bird was seen on the relatively early date of March 27.

Prairie Falcon

A single bird seen on April 10 was the only record for the season.

Observers

Principal Observers: George Halmazna (13 days), Terry Waters (11 days), Cliff Hansen (8 days), Joel Duncan (6 days), Bill Wilson (6 days), Jim Davis (3 days), Doug Pedersen (1 day)

Assistants: Cliff Hansen (10 days), Rod Smith (10 days), Chris Hunt (7 days), Kevin Barker (6 days), Gord Petersen (4 days), Jennifer Waters (4 days), Joel Duncan (3 days), Brian McBride (2 days), James and Theresa Bannon, Dave Hunt, Doug Pedersen and Judit Smits (1 day).

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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 site 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 2013 was the fourth spring count there (**Table 8**).

During the spring 2013 season Vance conducted a 25-day (83 hour) extended reconnaissance count out of a possible 46 days between March 1 and April 15 (**Table 10**). All observation was again conducted at the Scarface (Bill Nye) site. Between one and six hours at an average of 3.32 hours a day were spent at the site with most observations conducted between 1300 and 1800.

Details of the site are as follows:

Scarface/Bill Nye (49° 45' 11.10"N, 115° 38' 49.14"W, 1041m)

The Scarface site (named due to 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).

Weather

A record total of 21 days (March 2, 3, 6, 7, 12, 14, 16, 17, 20, 26, April 3-8, 10-15) were completely lost to adverse weather conditions when the ridges were obscured on heavily overcast days that often produced snow and rain. Only three days of observation were possible in April and the count

effectively finished on April 8. Hourly weather data were not gathered but daily weather summaries were produced (**Table 9**). The temperature high for the count was 21°C on April 1 and the lowest maximum daily temperature was 0°C on March 5, 23, 24 and 25. Average high temperatures on active observation days in March were 6.7°C (range 0°C to 15°C) and 15.7°C in April (range 6°C to 21°C, three days only). The most common ridge wind direction was W-SW (40% of active days), followed by S-SE (20%), N-NW (8%) and variable (4%). On seven days (28%) ridge wind direction could not be assessed. Winds were assessed as moderate 32% of active days, as light 28%, light to moderate 16%, strong 16% and were not assessed 16%. Most of the strong and moderate winds occurred to March 22, after which light to moderate winds prevailed. Only three days, March 30 to April 1, were completely cloudless. An additional 8 days had cloud cover of less than 50%. During the whole 46-day count period 34 days (74%) had cloud cover of 50% or more. During this period the ridges were clear 39.1% of the time, completely obscured 45.7%, mainly obscured 2.2% and partially clear 13%.

General flight dynamics

Consistent with the last three years, raptor movement along the western flanks of the Rocky Mountains appears to occur more sporadically than along the eastern flanks, and appears to be strongly weather dependent. This season 164 of the total of 363 migrant raptors (45%) occurred between March 3 and 11, and a further 108 (30%) moved between March 23 and 29. Peak raptor movement occurred on March 9 when 74 migrants were counted. Because of persistent overcast conditions in April only three days allowed counts and, as at Mount Lorette, this significantly reduced the number of Bald Eagles and juvenile Golden Eagles counted, and also led to very low counts of non-eagle species.

Count Summary

The count produced a total of 363 migrant raptors of 9 species (**Table 7**). Of this total 230 (63.7%) were Golden Eagles and 113 (31.1%) were Bald Eagles. Including the 3 unidentified eagles, eagle species together comprised 95.3% of the total flight which is almost identical to the 95.8% eagles recorded at Mount Lorette, although there Golden Eagles (2389) greatly outnumbered Bald Eagles (104). Other migrants at Steeples were scarce and comprised 1 adult Turkey Vultures, 1 Osprey, 1 unaged Sharp-shinned Hawk, 1 adult Northern Goshawk, 7 Red-tailed Hawks (5 adult light morph *B.j.calurus*, 1 adult dark morph *B.j.harlani*, and 1 indeterminate bird), 3 Rough-legged Hawks (1 light and 2 dark morphs), 1 unidentified *Buteo* and 2 Peregrine Falcons (1 adult and 1 of unknown age). The peregrines were seen on the early dates March 4 and 5, and it is possible that the same bird was present both days. The results of all four spring counts at the site are summarized on **Table 8**.

Golden and Bald Eagles

The 230 migrant Golden Eagles were recorded on 19 of a possible 25 active field days (76%) with a highest single day count of 53 on March 25 and with the second highest count of 25 on March 4. Only 6 days (24%) had double-digit counts this season. The flight comprised 204 adults, 3 subadults, 15 juveniles and 8 birds of indeterminate age giving an immature:adult ratio of 0.09. This is by far the lowest ratio recorded at the site and, as at Mount Lorette, reflects the lack of immature (and especially juvenile) birds in April.

A total of 113 migrant Bald Eagles were recorded on 18 days (72%) with a single day high count of 20 on March 9. The only other days with a double-figure count were March 19 (18) and March 4 (13). The flight comprised 72 adults, 11 subadults and 30 juveniles giving an immature:adult ratio of 0.58 compared to a ratio of 0.30 at Mount Lorette.

Principal Observer at Steeples

Vance Mattson

Appendix (separate attachment)

List of Tables

Table 1 Mount Lorette. Summary of spring counts 1993-2013

Table 2 Mount Lorette. Summary of spring counts 1993-2013, March 01-April 22

Table 3 Mount Lorette. Summary of spring counts 1993-2013, March 01-April 22 (excluding 08-10,12)

Table 4 Mount Lorette. March summary totals 1993-2013

Table 5 Mount Lorette. March summary totals 1993-2013 (excluding 08-10,12)

Table 6 Mount Lorette. Summary weather data, spring 2013

Table 7 Mount Lorette: Daily count numbers, spring 2013

Table 8 Steeples. Summary of spring counts 2010-2013

Table 9 Steeples. Summary weather data, spring 2013

Table 10 Steeples. Daily count numbers, spring 2013

TABLE 1																										
Mount Lorette, spring counts 1993-2013																										
YEAR	DAYS	HRS	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL
1993	48	392.66	1	5	169	4	39	19	54	0	0	34	0	4	4140	0	9	0	3	4	0	1	0	3	0	4489
1994	70	648.72	0	7	229	12	62	23	44	2	0	50	1	22	4213	2	2	3	0	14	2	1	0	0	0	4689
1995	65	581.96	0	10	176	9	73	11	46	1	0	43	2	25	4143	5	17	1	6	6	0	0	0	0	0	4574
1996	80	728.28	0	12	266	13	106	20	25	3	3	23	0	15	3671	7	8	1	4	4	3	2	0	0	0	4186
1997	75	680.55	1	7	224	7	53	12	21	1	0	35	0	15	2461	9	9	1	1	3	2	4	0	4	0	2870
1998	72	650.43	0	8	164	16	40	10	9	2	1	34	0	30	3613	6	7	1	1	2	1	4	0	2	0	3951
1999	90	907.03	1	8	210	17	155	44	14	5	2	82	1	18	2817	16	8	0	1	4	2	1	0	0	3	3409
2000	85	933.36	1	21	237	14	74	21	11	0	2	30	1	26	3436	13	11	1	1	2	0	4	3	0	8	3917
2001	90	1037.2	0	6	276	9	56	18	32	4	0	50	2	26	3525	6	12	3	4	0	5	2	4	0	2	4042
2002	82	914.09	0	12	265	7	77	8	33	0	0	32	0	21	3518	8	11	4	2	2	3	1	1	2	5	4012
2003	86	939.17	2	6	209	12	39	9	12	4	0	34	1	17	2591	7	9	2	2	0	5	2	1	0	6	2970
2004	86	1068.3	0	7	200	8	58	12	23	0	0	39	0	11	2539	2	8	0	3	3	1	1	2	2	6	2925
2005	94	1237.9	1	28	235	10	82	25	57	2	1	28	2	28	2667	9	10	3	3	2	3	3	6	1	7	3213
2006	93	1213.6	2	11	234	7	61	18	27	1	1	28	0	26	2918	4	16	1	2	0	9	3	8	0	3	3380
2007	83	1018.9	4	8	212	6	62	18	27	1	1	70	0	17	2141	9	20	3	2	5	8	0	0	1	6	2621
2008	44	493.34	0	0	86	1	1	1	2	0	0	3	0	1	1171	0	2	0	1	0	3	2	3	2	3	1282
2009	40	450	0	0	76	0	6	5	7	0	0	6	0	3	882	0	1	0	0	1	4	1	5	1	1	999
2010	46	518.99	0	0	88	1	1	0	21	0	0	14	0	7	1160	0	1	1	0	1	1	2	13	0	1	1312
2011	48	556.07	1	1	192	5	41	8	17	0	0	45	0	40	2982	1	4	1	2	2	1	6	13	0	0	3362
2012	48	495.4	0	1	91	2	25	6	16	0	0	52	0	7	1034	2	5	1	3	1	7	3	4	0	0	1260
2013	49	537.41	1	0	104	2	17	1	13	0	0	18	0	27	2389	0	7	0	1	1	10	10	4	1	1	2607
TOTALS	1474	16003	15	158	3943	162	1128	289	511	26	11	750	10	386	58011	106	177	27	42	57	70	53	67	19	52	66070

TABLE 2																										
Mount Lorette, spring counts March 01-April 22																										
YEAR	DAYS	HRS	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL
1993	43	369.4	1	3	167	3	37	19	51	0	0	31	0	4	4124	0	8	0	3	4	0	1	0	3	0	4459
1994	52	495.9	0	4	218	10	45	18	41	1	0	36	1	20	4142	0	1	3	0	11	2	1	0	0	0	4554
1995	46	459.6	0	4	164	1	31	6	44	0	0	32	2	18	4108	1	11	0	3	6	0	0	0	0	0	4431
1996	50	492.5	0	4	238	8	28	4	20	1	0	18	0	11	3543	0	5	0	1	3	3	1	0	0	0	3888
1997	48	460.3	0	2	212	4	16	5	16	0	0	21	0	12	2352	2	7	1	0	2	2	1	0	1	0	2656
1998	52	458.5	0	0	149	6	20	4	7	0	0	21	0	29	3466	0	7	1	1	2	0	1	0	2	0	3716
1999	50	529.4	0	0	184	10	9	6	9	0	0	46	0	15	2565	1	6	0	0	2	1	1	0	0	1	2856
2000	48	554.6	0	1	204	5	28	7	9	0	0	14	0	24	3219	5	5	1	0	1	0	3	3	0	4	3533
2001	50	586.8	0	1	237	4	29	7	25	0	0	30	1	21	3265	2	8	3	1	0	0	0	4	0	2	3640
2002	52	587.6	0	1	240	4	32	5	25	0	0	25	0	9	3405	2	7	3	0	1	3	1	0	2	5	3770
2003	49	569.8	0	1	184	5	10	4	12	0	0	24	0	14	2558	1	5	2	0	0	5	1	1	0	3	2830
2004	51	646.9	0	6	173	1	24	7	20	0	0	32	0	11	2465	1	8	0	3	2	0	1	2	2	4	2762
2005	53	697.4	0	1	182	2	16	2	44	0	0	15	0	8	2594	0	6	3	0	0	1	1	6	0	4	2885
2006	53	694.3	0	2	190	4	31	10	22	0	0	18	0	24	2826	0	12	1	1	0	5	3	8	0	3	3160
2007	50	622.6	0	1	189	3	32	6	19	0	0	45	0	14	2051	1	13	3	1	2	1	0	0	0	3	2384
2008	44	493.3	0	0	86	1	1	1	2	0	0	3	0	1	1171	0	2	0	1	0	3	2	3	2	3	1282
2009	40	450	0	0	76	0	6	5	7	0	0	6	0	3	882	0	1	0	0	1	4	1	5	1	1	999
2010	46	519	0	0	88	1	1	0	21	0	0	14	0	7	1160	0	1	1	0	1	1	2	13	0	1	1312
2011	48	556.1	1	1	192	5	41	8	17	0	0	45	0	40	2982	1	4	1	2	2	1	6	13	0	0	3362
2012	48	495.4	0	1	91	2	25	6	16	0	0	52	0	7	1034	2	5	1	3	1	7	3	4	0	0	1260
2013	49	537.4	1	0	104	2	17	1	13	0	0	18	0	27	2389	0	7	0	1	1	10	10	4	1	1	2607
T 93-12	973	10739	2	33	3464	79	462	130	427	2	0	528	4	292	53912	19	122	24	20	41	39	30	62	13	34	59739
Av 93-12	48.7	537.0	0.1	1.7	173.2	4.0	23.1	6.5	21.4	0.1	0.0	26.4	0.2	14.6	2695.6	1.0	6.1	1.2	1.0	2.1	2.0	1.5	3.1	0.7	1.7	2987.0
variance	0.7	0.1	900.0	-100.0	-40.0	-49.4	-26.4	-84.6	-39.1	-100.0	0.0	-31.8	-100.0	84.9	-11.4	-100.0	14.8	-100.0	0.0	-51.2	412.8	566.7	29.0	53.8	-41.2	-12.7

TABLE 3																										
Mount Lorette, spring counts March 01-April 22 (excluding anomalously low counts 2008-2010 and 2012)																										
YEAR	DAYS	HRS	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL
1993	43	369.4	1	3	167	3	37	19	51	0	0	31	0	4	4124	0	8	0	3	4	0	1	0	3	0	4459
1994	52	495.9	0	4	218	10	45	18	41	1	0	36	1	20	4142	0	1	3	0	11	2	1	0	0	0	4554
1995	46	459.6	0	4	164	1	31	6	44	0	0	32	2	18	4108	1	11	0	3	6	0	0	0	0	0	4431
1996	50	492.5	0	4	238	8	28	4	20	1	0	18	0	11	3543	0	5	0	1	3	3	1	0	0	0	3888
1997	48	460.3	0	2	212	4	16	5	16	0	0	21	0	12	2352	2	7	1	0	2	2	1	0	1	0	2656
1998	52	458.5	0	0	149	6	20	4	7	0	0	21	0	29	3466	0	7	1	1	2	0	1	0	2	0	3716
1999	50	529.4	0	0	184	10	9	6	9	0	0	46	0	15	2565	1	6	0	0	2	1	1	0	0	1	2856
2000	48	554.6	0	1	204	5	28	7	9	0	0	14	0	24	3219	5	5	1	0	1	0	3	3	0	4	3533
2001	50	586.8	0	1	237	4	29	7	25	0	0	30	1	21	3265	2	8	3	1	0	0	0	4	0	2	3640
2002	52	587.6	0	1	240	4	32	5	25	0	0	25	0	9	3405	2	7	3	0	1	3	1	0	2	5	3770
2003	49	569.8	0	1	184	5	10	4	12	0	0	24	0	14	2558	1	5	2	0	0	5	1	1	0	3	2830
2004	51	646.9	0	6	173	1	24	7	20	0	0	32	0	11	2465	1	8	0	3	2	0	1	2	2	4	2762
2005	53	697.4	0	1	182	2	16	2	44	0	0	15	0	8	2594	0	6	3	0	0	1	1	6	0	4	2885
2006	53	694.3	0	2	190	4	31	10	22	0	0	18	0	24	2826	0	12	1	1	0	5	3	8	0	3	3160
2007	50	622.6	0	1	189	3	32	6	19	0	0	45	0	14	2051	1	13	3	1	2	1	0	0	0	3	2384
2008																										
2009																										
2010																										
2011	48	556.1	1	1	192	5	41	8	17	0	0	45	0	40	2982	1	4	1	2	2	1	6	13	0	0	3362
2012																										
2013	49	537.4	1	0	104	2	17	1	13	0	0	18	0	27	2389	0	7	0	1	1	10	10	4	1	1	2607
T 93-07,11	795	8782	2	32	3123	75	429	118	381	2	0	453	4	274	49665	17	113	22	16	38	24	22	37	10	29	54886
Av 93-07,11	49.7	548.9	0.1	2.0	195.2	4.7	26.8	7.4	23.8	0.1	0.0	28.3	0.3	17.1	3104	1.1	7.1	1.4	1.0	2.4	1.5	1.4	2.3	0.6	1.8	3430.4
variance	-1.4	-2.1	700.0	-100.0	-46.7	-57.3	-36.6	-86.4	-45.4	-100.0	0.0	-36.4	-100.0	57.7	-23.0	-100.0	-0.9	-100.0	0.0	-57.9	566.7	627.3	73.0	60.0	-44.8	-24.0

TABLE 4																										
MARCH SUMMARY TOTALS, MOUNT LORETTE 1993-2013																										
	days	hrs.	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ME	GY	PG	PR	UA	UB	UE	UF	UU	T
1993	23	180	0	0	107	2	7	2	20	0	0	7	0	2	3176	0	4	0	1	0	0	1	0	1	0	3330
1994	30	281	0	0	154	2	1	3	21	0	0	7	0	0	3356	0	1	2	0	7	0	0	0	0	0	3554
1995	28	264.7	0	0	92	1	1	1	34	0	0	5	0	7	3618	0	4	0	0	2	0	0	0	0	0	3765
1996	29	254.6	0	0	110	1	3	1	11	0	0	1	0	3	2370	0	1	0	0	2	0	0	0	0	0	2503
1997	26	250.5	0	0	109	0	1	0	5	0	0	4	0	1	2118	0	2	1	0	1	0	0	0	0	0	2242
1998	30	255.5	0	0	79	1	3	0	2	0	0	1	0	3	2895	0	3	1	0	1	0	0	0	0	0	2989
1999	29	305.6	0	0	124	1	2	4	6	0	0	2	0	1	2320	0	3	0	0	1	0	0	0	0	1	2465
2000	27	305.6	0	0	141	0	0	0	4	0	0	5	0	1	2751	0	0	0	0	1	0	1	2	0	1	2907
2001	31	363.7	0	0	137	0	0	1	8	0	0	3	0	1	2694	0	5	2	0	0	0	0	3	0	1	2855
2002	30	310.3	0	0	119	0	0	0	6	0	0	2	0	0	1950	0	3	1	0	0	0	0	0	1	1	2083
2003	28	311.4	0	0	118	0	2	0	6	0	0	1	0	4	2055	0	2	0	0	0	1	0	0	0	0	2189
2004	30	369.7	0	0	126	0	2	0	12	0	0	12	0	6	2300	0	1	0	1	1	0	0	1	1	2	2465
2005	31	387.8	0	0	121	0	4	1	26	0	0	3	0	1	2319	0	3	3	0	0	0	0	5	0	1	2487
2006	31	393.9	0	0	101	1	1	0	9	0	0	8	0	2	2544	0	2	1	0	0	0	0	1	0	0	2670
2007	31	385.3	0	0	91	0	0	0	6	0	0	8	0	1	1782	0	1	2	0	1	0	0	0	0	1	1893
2008	31	342.3	0	0	73	1	0	0	2	0	0	1	0	1	1093	0	2	0	0	0	2	1	3	0	2	1181
2009	27	289.4	0	0	36	0	5	0	5	0	0	0	0	2	684	0	0	0	0	1	3	0	5	1	1	743
2010	31	347.1	0	0	64	1	0	0	17	0	0	6	0	6	1051	0	0	1	0	0	1	2	10	0	1	1160
2011	27	305.4	1	0	124	2	5	1	9	0	0	2	0	9	2554	0	0	1	1	1	0	4	10	0	0	2724
2012	28	270.8	0	0	42	0	3	1	1	0	0	1	0	5	771	0	1	0	0	0	1	1	1	0	0	828
2013	29	308.8	1	0	74	0	9	0	10	0	0	8	0	4	2216	0	3	0	1	0	8	7	4	1	0	2346
TOTAL	607	6483	2	0	2142	13	49	15	220	0	0	87	0	60	46617	0	41	15	4	19	16	17	45	5	12	49379
Av 93-12	28.9	308.7	0.05	0	103	0.65	2	0.75	10.5	0	0	3.95	0	2.8	2220.1	0	1.9	0.75	0.15	0.95	0.4	0.5	2.05	0.2	0.6	2351.7
13 cf Av	0.35	0.008	1900	0	-28.4	-100	350	-100	-4.76	0	0	103	0	42.9	-0.1824	0	57.9	-100	567	-100	1900	1300	95.1	400	-100	-0.2403

TABLE 5																										
MARCH SUMMARY TOTALS, MOUNT LORETTE 1993-2013 (less 2008-2010,2013)																										
	days	hrs.	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ME	GY	PG	PR	UA	UB	UE	UF	UU	T
1993	23	180	0	0	107	2	7	2	20	0	0	7	0	2	3176	0	4	0	1	0	0	1	0	1	0	3330
1994	30	281	0	0	154	2	1	3	21	0	0	7	0	0	3356	0	1	2	0	7	0	0	0	0	0	3554
1995	28	264.7	0	0	92	1	1	1	34	0	0	5	0	7	3618	0	4	0	0	2	0	0	0	0	0	3765
1996	29	254.6	0	0	110	1	3	1	11	0	0	1	0	3	2370	0	1	0	0	2	0	0	0	0	0	2503
1997	26	250.5	0	0	109	0	1	0	5	0	0	4	0	1	2118	0	2	1	0	1	0	0	0	0	0	2242
1998	30	255.5	0	0	79	1	3	0	2	0	0	1	0	3	2895	0	3	1	0	1	0	0	0	0	0	2989
1999	29	305.6	0	0	124	1	2	4	6	0	0	2	0	1	2320	0	3	0	0	1	0	0	0	0	1	2465
2000	27	305.6	0	0	141	0	0	0	4	0	0	5	0	1	2751	0	0	0	0	1	0	1	2	0	1	2907
2001	31	363.7	0	0	137	0	0	1	8	0	0	3	0	1	2694	0	5	2	0	0	0	0	3	0	1	2855
2002	30	310.3	0	0	119	0	0	0	6	0	0	2	0	0	1950	0	3	1	0	0	0	0	0	1	1	2083
2003	28	311.4	0	0	118	0	2	0	6	0	0	1	0	4	2055	0	2	0	0	0	1	0	0	0	0	2189
2004	30	369.7	0	0	126	0	2	0	12	0	0	12	0	6	2300	0	1	0	1	1	0	0	1	1	2	2465
2005	31	387.8	0	0	121	0	4	1	26	0	0	3	0	1	2319	0	3	3	0	0	0	0	5	0	1	2487
2006	31	393.9	0	0	101	1	1	0	9	0	0	8	0	2	2544	0	2	1	0	0	0	0	1	0	0	2670
2007	31	385.3	0	0	91	0	0	0	6	0	0	8	0	1	1782	0	1	2	0	1	0	0	0	0	1	1893
2008																										0
2009																										0
2010																										0
2011	27	305.4	1	0	124	2	5	1	9	0	0	2	0	9	2564	0	0	1	1	1	0	4	10	0	0	2734
2012																										
2013	29	308.8	1	0	74	0	9	0	10	0	0	8	0	4	2216	0	3	0	1	0	8	7	4	1	0	2346
TOTAL	490	5234	2	0	1927	11	41	14	195	0	0	79	0	46	43028	0	38	14	4	18	9	13	26	4	8	45477
Av 93-10	28.8	307.8	0.06	0	116	0.69	2	0.88	11.6	0	0	4.44	0	2.63	2550.8	0	2.19	0.88	0.19	1.13	0.063	0.38	1.38	0.19	0.5	2695.7
13 cf Av	0.65	0.308	1500	0	-36.1	-100	350	-100	-13.5	0	0	80.3	0	52.4	-13.124	0	37.1	-100	433	-100	12700	1767	191	433	-100	-12.972

TABLE 6														
MOUNT LORETTE, SPRING 2013														
SUMMARY WEATHER														
												% TIME		
RIDGE WIND									RIDGES			#		
		TEMP				max	CLOUD			PRECIPITATION & NOTES		OBSCURED		migrant
Day #		Max	Min	Direction	Velocity	gust	Max%	Min%	type		West	East	raptors	
1	Mar	1	7	2	SW	M-S	100	30	Cu,Sc>Ns	Light drizzle after 1300	20	80	1	
2	Mar	2	8	4	WSW	S	100	100	Ns,Sc,Cu,As	Light drizzle after 1100	20	90	1	
	Mar	3	NO OBSERVATION					100	100	St	Snow obscuring all ridges	100	100	no
3	Mar	4	-2	-6	SW	L-M	90	10	Cu,Ac,Ac, Cs	Good viewing conditions	50	90	0	
4	Mar	5	-2	-22	W	C-L	100	5	Cu,As,,Ci	Good viewing conditions			2	
5	Mar	6	-1	-12	?	?	100	100	Ci,As	Hazy sun	20	20	2	
6	Mar	7	-3	-6	W	L	100	80	St,Cu,Ac,As	All obscured in am, hazy sun in pm	40	70	0	
	Mar	8	NO OBSERVATION								No observer			no
7	Mar	9	7	-10	?	L-M				Blue sky			24	
8	Mar	10	5	-1	WNW	M-S	100	30	St,Cu,As	Few snow flurries			57	
9	Mar	11	0	-7	?	M-S	90	30	Cu	Some flurries, good viewing			12	
10	Mar	12	5.5	-5	SW	M-S	100	50	Cu,As	Good view to east		50	24	
11	Mar	13	11	4	SW	S	100	20	Ac,As	Lusk Creek - rain at Hay Meadow			58	
12	Mar	14	-4	-8	WNW	S	100	80	Fog,Sc	Rain & fog becoming light snow	70	90	32	
13	Mar	15	-7	0	W	M-S	90	50	Cu	Light snow showers all day		10	60	
14	Mar	16	4	-10	W	L-M	100	50	Cu,As>St,Cu,Ac,As	Deteriorating weather in pm	25	50	102	
15	Mar	17	-6	-13.5	?	L-M	100	40	St>St,Cu,As,	Snow to mid pm	50	60	2	
16	Mar	18	-2	-15	SW	S	100	60	Cu,Cs	Periods of snow all day	50	80	115	
17	Mar	19	1	-18	SW	M-S	100	10	Cu,Lent,Cs,Cc	Good viewing conditions			169	
18	Mar	20	10	0	SW-WSW	S	60	30	Ac	Good viewing conditions		10	88	
19	Mar	21	4	-3	W	M-S	100	90	Ac,As>St	Snow in pm; hazy sun	30	60	40	
20	Mar	22	-5	-7	NW	L	70	50	Ac	Lusk Creek – poor weather at Hay Meadow			4	
21	Mar	23	-2	-19	SW-W	L-M	80	0	Cu	Good viewing			296	
22	Mar	24	0.5	-22	W-WSW	M-S	0	0					276	
23	Mar	25	5	-15	SW	M	0	0		Blue sky			348	
24	Mar	26	7	-13	SW?	M	80	0	Ci,contrails				365	
25	Mar	27	10	-10	SW	S	70	20	Sc,Ac,Ci				79	
26	Mar	28	11	-7	Calm-W	L-M	30	10	Cu,As				77	
27	Mar	29	9	-7	W	M-S	90	0	Cu,Ac,Ci				21	
28	Mar	30	10	2	W-SW	L-M	40	10	Cu,Ci				83	

2012-04-07	NO OBSERVATION																					0			
2012-04-08	10.50	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4		
2012-04-09	12.50	0	0	1	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0	7		
2012-04-10	8.50	0	0	0	0	0	0	1	0	0	1	0	0	3	0	1	0	0	1	0	0	0	7		
2012-04-11	12.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-04-12	8.50	0	0	4	0	0	1	0	0	0	2	0	0	7	0	0	0	0	0	0	0	0	14		
2012-04-13	10.00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1		
2012-04-14	13.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-04-15	12.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-04-16	9.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1		
2012-04-17	12.00	0	0	6	0	2	0	0	0	0	2	0	1	4	0	1	0	0	0	0	0	0	16		
2012-04-18	13.08	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3		
2012-04-19	8.50	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	6		
2012-04-20	11.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-04-21	14.33	0	0	0	1	0	0	0	0	0	1	0	19	12	0	0	0	0	0	2	0	0	36		
2012-04-22	14.00	0	0	1	0	1	0	0	0	0	1	0	1	2	0	1	0	0	0	0	0	0	7		
April	228.16	0	0	30	2	8	1	3	0	0	10	0	23	173	0	4	0	0	1	2	3	0	1	261	
Total	537.41	1	0	104	2	17	1	13	0	0	18	0	27	2389	0	7	0	1	1	10	10	4	1	1	2607
Date	HRS	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL

TABLE 8																											
Steeple, BC, spring counts 2010-2012																											
YEAR	DAYS	HRS	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL	
2010	48	213.5	13	2	218	2	7	0	8	0	0	20	0	7	534	2	0	0	1	0	0	0	2	0	0	816	
2011	28	118.5	12	0	147	1	5	0	2	0	0	7	0	2	395	0	0	0	0	0	0	0	2	0	0	573	
2012	32	98.5	9	2	112	1	7	0	2	0	0	11	0	7	236	1	0	0	1	0	0	0	4	0	0	393	
2013	25	83	1	1	113	0	1	0	1	0	0	7	0	3	230	0	0	0	2	0	0	1	3	0	0	363	
TOTALS	133	513.5	35	5	590	4	20	0	13	0	0	45	0	19	1395	3	0	0	4	0	0	1	11	0	0	2145	

TABLE 9										
STEEPLES, SPRING 2013										
SUMMARY WEATHER										
RIDGE WIND CLOUD RIGDES #										
TEMP PRECIPITATION & NOTES migrant										
Day #			Direction	Velocity	%	type			raptors	
1	Mar	1	7	S	S	?	?	Partial sun	Clear	0
	Mar	2	NO OBSERVATION			100	St	Snow flurries	Obscured	no
	Mar	3	NO OBSERVATION			100	St	Snow flurries	Obscured	no
2	Mar	4	2	?	?	50-100	Cu	Mixed sun and cloud	Clear	39
3	Mar	5	0-2	S-SE	M	100	As		Clear	20
	Mar	6	NO OBSERVATION			100	St	Heavy snow	Obscured	no
	Mar	7	NO OBSERVATION			100	St	Snow: clearing late in the day	Mainly obscured	no
4	Mar	8	?	W	L	90	Cu,As		Clear	12
5	Mar	9	7	?	L	50-100	Cu	Sunny	Clear	74
6	Mar	10	6	SW	M	100	As	Partial sun	Partially clear	8
7	Mar	11	8	N	M	40	Cu	Sunny	Partially clear	11
	Mar	12	NO OBSERVATION			100	St	Heavy snow	Obscured	no
8	Mar	13	12	W-SW	S	100	As,Cu	Cloudy	Partially clear	11
	Mar	14	NO OBSERVATION			100	St	Overcast	Obscured	no
9	Mar	15	?	?	?	50-100	As,Cu,Ci	Mainly cloudy	Partially clear	12
	Mar	16	NO OBSERVATION			100	St	Overcast	Obscured	no
	Mar	17	NO OBSERVATION			100	St	Overcast	Obscured	no
10	Mar	18	5	SW	M	50-100	Cu	Sunny	Clear	1
11	Mar	19	2-7	SW	M	40	As,Cu,lent	Sunny	Clear	44
	Mar	20	NO OBSERVATION			100	St	Snow	Obscured	no
12	Mar	21	1	SW	S	100	As	Cloudy	Obscured	0
13	Mar	22	2-5	S	M	50	Cu		Partially clear	3
14	Mar	23	0	S-SE	L-S	30	Cu	Sunny	Partially clear	26
15	Mar	24	0-5	SE	L-M	20	Cu	Sunny	Clear	22
16	Mar	25	0-5	SW	L-M	10	Cu,Ci	Sunny	Clear	8
17	Mar	26	5-9	SW	L-M	30	As	Sunny	Clear	26
18	Mar	27	8	?	L	30	Cu,Ci	Sunny	Clear	12
19	Mar	28	13	SW	M	50	Ac,As	Sunny	Clear	1
20	Mar	29	9	NW	L-M	80	Cu	Partial sun	Clear	13
21	Mar	30	13	?	L	0		Sunny	Clear	2
22	Mar	31	15	?	L	0		Sunny	Clear	7
23	Apr	1	21	?	L	0		Sunny	Clear	9
24	Apr	2	20	W-S	M	80	As (thin),Cu	Sunny	Clear	0
	Apr	3	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	4	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	5	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	6	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	7	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	8	NO OBSERVATION			100	St	Overcast	Obscured	no
25	Apr	9	6	SW	L	20	Cu	Sunny	Clear	2
	Apr	10	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	11	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	12	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	13	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	14	NO OBSERVATION			100	St	Overcast	Obscured	no
	Apr	15	NO OBSERVATION			100	St	Overcast	Obscured	no
									TOTAL	363

TABLE 10																											
Steeple, British Columbia, spring 2013																											
March 01 to April 15 (25 days, 83 hours)																											
Date	hrs.	TV	OS	BE	NH	SS	CH	NG	BW	SW	RT	FH	RL	GE	AK	ML	GY	PG	PR	UA	UB	UE	UF	UU	TOTAL		
2012-03-01	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-03-02	NO OBSERVATION																										
2012-03-03	NO OBSERVATION																										
2012-03-04	4	0	0	13	0	0	0	0	0	0	0	0	0	25	0	0	0	1	0	0	0	0	0	0	39		
2012-03-05	2.5	0	0	9	0	0	0	0	0	0	0	0	0	9	0	0	0	1	0	0	0	1	0	0	20		
2012-03-06	NO OBSERVATION																										
2012-03-07	NO OBSERVATION																										
2012-03-08	2	0	0	4	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	12		
2012-03-09	5.5	0	0	20	0	0	0	0	0	0	0	0	1	53	0	0	0	0	0	0	0	0	0	0	74		
2012-03-10	4	0	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	8		
2012-03-11	3.5	0	0	2	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	11		
2012-03-12	NO OBSERVATION																										
2012-03-13	2.5	0	0	1	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	11		
2012-03-14	NO OBSERVATION																										
2012-03-15	3.5	0	0	3	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	12		
2012-03-16	NO OBSERVATION																										
2012-03-17	NO OBSERVATION																										
2012-03-18	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1		
2012-03-19	5	0	0	18	0	0	0	0	0	0	2	0	0	24	0	0	0	0	0	0	0	0	0	0	44		
2012-03-20	NO OBSERVATION																										
2012-03-21	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-03-22	3	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3		
2012-03-23	5	0	0	5	0	0	0	0	0	0	0	0	1	20	0	0	0	0	0	0	0	0	0	0	26		
2012-03-24	5	0	0	6	0	0	0	0	0	0	2	0	0	14	0	0	0	0	0	0	0	0	0	0	22		
2012-03-25	4	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	8		
2012-03-26	5.5	0	0	8	0	1	0	1	0	0	2	0	0	14	0	0	0	0	0	0	0	0	0	0	26		
2012-03-27	3	0	0	8	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	12		
2012-03-28	3.5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1		
2012-03-29	4	0	0	5	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	1	0	0	0	13		
2012-03-30	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		
2012-03-31	3	0	0	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7		
March	75	0	0	110	0	1	0	1	0	0	6	0	3	225	0	0	0	2	0	0	1	3	0	0	352		
2012-04-01	3.5	0	0	3	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0	0	0	9		
2012-04-02	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2012-04-03	NO OBSERVATION																										
2012-04-04	NO OBSERVATION																										
2012-04-05	NO OBSERVATION																										
2012-04-06	NO OBSERVATION																										

