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## Golden Eagle Migration In The Rockies: The Big Picture Begins To Emerge

By Peter Sherrington

At 11:30 on March 20, 1993, in company with fellow AWA member Des Allen, I noted the first migratory Golden Eagle (although I didn't know it at the time) to be seen in the Mount Lorette area. At the end of the fall 2001 migration, 20 migration seasons, 1,515 field days and 14,448 days later we had recorded a staggering 69,677 migratory Golden Eagles out of a total of 84,280 migratory birds of prey.

These data have been gathered entirely by a small group of dedicated volunteers who in recent years have been spending an average of 11 hours a day at the Hay Meadow site by the Kananaskis River. We have endured temperatures ranging from  $-30$  to  $+30^{\circ}\text{C}$ , wind gusts often exceeding 100 km/hour and every kind of precipitation imaginable. Why do we do this?

The Mount Lorette site conducts the only systematic daily count of migrant raptors in the whole of Western Canada and is one of only about ten such sites in western North America. It is also almost unique in the world in that we monitor the same migratory population in both spring and fall at the same location. As birds of prey, and especially eagles, are top predators in their ecosystems, studying their populations gives us information about changes in their habitats and threats to their (and ultimately to our) survival.

It is amazing now to think that before 1992 almost nothing was known about Golden Eagle migration in the mountains. Virtually all the existing data at this time supported the idea that birds moved through the foothills and the high plains between Calgary and the mountain front. It indicated that, perhaps, only a few hundred birds were involved, and that their migration period was short and involved mainly immature birds.

It was not generally recognized that the birds were undertaking true migrations, and it was believed that they were not moving great distances. An example of this is the Banff and Jasper Park Biophysical study of 1983 which records a maximum spring count of four birds and a fall count of nine. The reality is that at least 6,000 Golden Eagles pass twice a year through the two parks.

The first important thing our work has shown is how little we actually know about what exists in our wilderness areas. If we can miss something as spectacular as a flight of several thousand Golden Eagles, it is probable that we are missing a lot of other things as well.

The movement of eagles is a spectacular sight, but to me it is the patterns of the movement and what they tell me that keep me studying them. The birds use substantially the same route in the spring as they do in the fall, which is highly unusual for any population of migratory raptors anywhere in the world. We are also seeing a high percentage of the population (perhaps 50-70%) which means that observed changes in the population structure are highly significant.

We now know that migrating birds are passing the Mount Lorette site for up to seven months of the year. Spring migration starts in mid-February with the peak movement involving mainly adult birds occurring in the last three weeks of March. Movement continues to mid May (and sometimes almost to the end of May) involving a progressively higher percentage of immature birds.





In the fall, migration begins in late August or early September and continues well into December on most years. Peak movement is in October, and immature birds tend to move earlier than adults, although the separation is not as marked as it is in the spring. The median passage date for the species and for adult birds (the date on which 50% of the population has moved) in the spring averages 22 March.

The variance around this date is only 3.5 days on either side, which is remarkable considering the wide variety of weather conditions that have characterized the springs of the last nine years. The clear trend, however, is for the spring median to become earlier, and over a decade the birds appear to now be moving about three days earlier than they were in the early 1990's: yet another probable indicator of global warming.

To me the most satisfying and amazing part of the study is how closely the percentage of immature birds counted at Mount Lorette in the fall matches the fledging success of a population of about 80 pairs being studied by Carol McIntyre in Denali National Park, Alaska. This breeding population is about 3,000 kilometres to the northwest of Lorette and yet the correlation of the two data sets is almost perfect. This tells us a number of things.

Firstly, this is the first time that age statistics at a migration site has been correlated with a known breeding area so it demonstrates that such statistics mean something. Secondly it demonstrates the Denali population is absolutely typical of the total breeding area of the migratory population, which is probably the low Arctic high sub-arctic area between the Mackenzie River and the Bering Sea. It also shows that whatever is controlling breeding success is regional and must almost certainly involve food.

The trends of both data sets clearly show that breeding success steadily rose from 1993 to 1999. Oddly, during this same period, the total numbers of migrants counted at Mount Lorette steadily declined, until the fall of 2000 when we counted a record passage of 4,753 birds. The pattern probably reflects the cyclicity of Golden Eagle prey species, mainly Snowshoe Hare and grouse/ptarmigan, and works something like this. As prey species increase they allow breeding birds to supplement staple food species such as Arctic Ground Squirrel, which means that more hatched birds fledge and survive to migrate. The increase also allows a slightly higher percentage of adult birds to winter and survive north of the Lorette site. When the prey diminishes, fledging success decreases and almost the entire population, both immatures and adults, has to move south to find winter food.

So where do the birds go in winter? Most of the adult population probably winters on the western Great Plains of the U.S. from southern Montana to northeastern Colorado. Most of the immature birds go further south, many wintering in northern Mexico and the Border States.

Carol has been conducting telemetry work on juvenile birds for several years now, and has demonstrated the full extent of the migration that I originally proposed in the early 1990's based on the dynamic of the movement at Mount Lorette. By comparing the ratios of immature and adult birds of south-bound migrants in the fall with the same birds returning the following spring, we can gauge how successful the birds have been in surviving the winter.

The data suggest that about 50% of juvenile birds do not survive their first winter, and that there appears to be an inverse relationship between breeding success and wintering success. In other words it appears the more birds that are produced the fewer survive the winter. This tells us that there is a problem on the birds' winter range, which appears to be a stressed system. Whether this is because of hunting, pollution, habitat destruction or prey diminution we cannot tell. All we can do is to alert people to the existence of a likely problem.





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What this does tell us is that by spending almost 200 days a year in a valley in southern Alberta, we can do accurate breeding analysis of the birds in the U.S and Canadian Arctic, and get insights into their winter survival ecology in northern Mexico and the southern States. It also, I hope, demonstrates the effectiveness and usefulness of long term studies.

I hope that people will be conducting complete raptor counts at the Mount Lorette site for many years to come, and the recent awarding of Federal charitable status to the Rocky Mountain Eagle Research Foundation is a huge step towards making this a possibility. We are always looking for volunteers, both to assist at the counts and to work with fundraising or education programs. If you are interested please contact me through the AWA Calgary office.

The eagles have taught me a lot since I saw that first bird soaring over Mount Lorette in 1992. I hope that we will continue to learn from them. As long as they fly we have a future.

*(Peter Sherrington is President, Rocky Mountain Eagle Research Foundation and Past President, AWA)*

