

# Fall 2019 Golden Eagle Migration Survey Big Belt Mountains, Montana



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*Report submitted to:*

**U.S. Forest Service, Helena-Lewis & Clark National Forest**

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## Overview

The Big Belts is a 75-mile long, northwest-southeast trending ridgeline managed by the Helena - Lewis and Clark National Forest in west-central Montana (Site G - Fig. 1). The range is bordered to the west by Canyon Ferry Lake, a 35,181-acre artificial reservoir created by the damming of the Upper Missouri River. To the east of the Big Belts lies Shields Valley and farther east is another string of northwest-southeast trending mountain ranges. Following the Big Belt Mountains toward the south, southeast leads to the Bridger Mountains, where many of the raptors migrating through the Big Belt Mountains also likely pass. The Big Belts are part of a network of ten migration survey sites in western Montana north through Alberta.



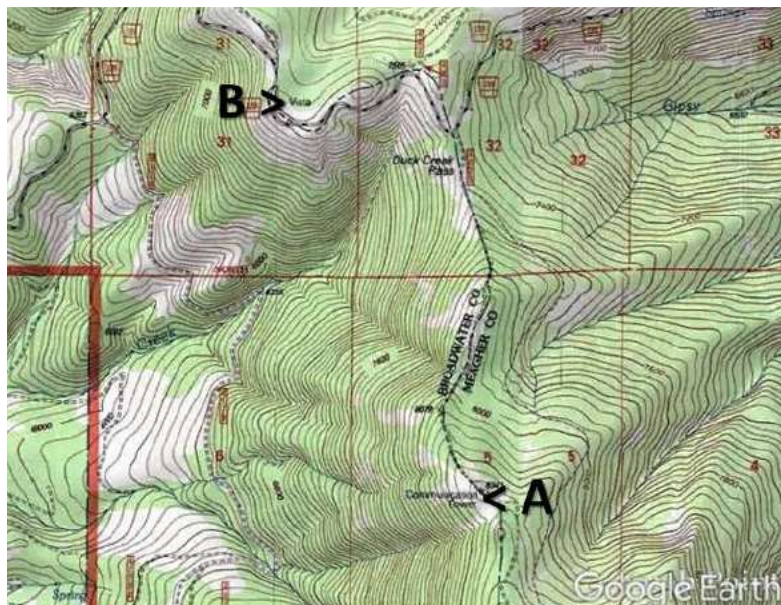
**Figure 1.** Approximate locations of hawk-count sites in Montana and Alberta, Canada, during 2019 Fall migration surveys. A) Mt. Lorette (Alberta); B) Mt. Brown (Glacier National Park); C) Cut Bank; D) Jewel Basin; E) Roger's Pass; F) MPG Ranch; G) Big Belts; H) Grassy Mountain; I) Bridger Mountain; J) Hayden Valley (Yellowstone National Park).

The Big Belt Mountains were first recognized as a significant Golden Eagle migration flyway by Missoula-based Rob Domenech, with Raptor View Research Institute (RVRI) in 2007. Exploratory migration counts were conducted by Steve Hoffman, founder of HawkWatch International and former Executive Director of Montana Audubon, in October of 2014. Since 2015, Montana Audubon has supported annual migration surveys at Duck Creek Pass utilizing two primary survey locations: ‘Radio Tower West Slope’ and ‘Vista Point’.

Strong southwesterly winds typically prevail across the crest of the Big Belts. These consistent winds, combined with the Big Belts’ steep west-facing slopes, generate powerful orographic lift, thus providing ideal flying conditions for migrating raptors. The ‘lake-effect’ of Canyon Ferry Reservoir may enhance the consistency and speed of these westerly winds over the Big Belts. These factors, along with the prominent “leading line” created by the Rocky Mountain Front (which extends to the north well into Canada) make the southern end of the Big Belts a profoundly significant concentration point for migrating raptors in autumn.

### Observation Site

During fall 2019, observers utilized ‘Vista Point’ on the west slope of the Big Belts (Fig. 2). This site is typically used when fog and low cloud cover dramatically reduced visibility at the ‘Radio Tower West Slope’ site. Vista Point is located at an elevation of 7,570 feet, and within 40m of Duck Creek Pass Road (N = 46.497535 degrees, W = -111.268915 degrees). This site was easily accessible by regular passenger vehicles in 2019 due to fresh grading, however drifting snow prohibited access early in the season. In less inclement weather, this site remains an ideal location to bring field-trip participants, and to conduct surveys.



**Figure 2.** Location “B” of Big Belts raptor migration observation site was utilized during the 2019 fall survey period. A) Radio Tower West Slope (RTWS); B) Vista Points (VP).



## Methods

Between September 24<sup>th</sup> – October 24<sup>th</sup>, three Montana Audubon employees (Amy Seaman, Bo Crees, and Caroline Provost), as well as one well-qualified US Forest Service employee (Shaun Hyland) acted as the primary observers for the GEMS Project. One new observer was trained in 2019, Caroline Provost. No observers were camped at Duck Creek Pass location, and the September 24<sup>th</sup> – October 24<sup>th</sup> survey objective was intended to coincide with observation efforts, conducted by Raptor View Research Institute and Teton Raptor Center, at the more southerly Grassy Mountain site (Fig. 1). Two major snowstorms, one on September 21<sup>st</sup>, and on October 13<sup>th</sup> made access impossible. More difficult than access however, were the low-lying clouds that disrupted visibility on over half of the available survey days. Coupled with poor access to adequate vehicles, observations were carried out September 24<sup>th</sup> – October 19<sup>th</sup>, on just nine days.

Observation hours began regularly at 0900, and on most days concluded at 1700 (MST). Each day observers recorded:

1. Species, age, sex and color morph of each migrant raptor, whenever possible and applicable (Appendix A lists common/scientific names for all species, species-specific applicability of various age, sex, and color morph distinctions, and 2-letter codes used for each species).
2. Hour of passage for each migrant (e.g., the 0900–0959 H, etc - Mountain Standard Time).
3. Hourly wind speed and direction, air temperature, percent cloud cover, predominant cloud type(s), presence of precipitation (and type), visibility, and a subjective assessment of thermal lift conditions (i.e., excellent, good, fair and poor) – assessed on the half-hour.
4. Predominant direction, altitude, and horizontal distance from the observation point of the migratory flight for each hour.
5. Total minutes observed, and the mean number of observers present during each hour (including official observers plus volunteers/visitors who contributed substantially to the count [actively scanning, pointing out birds, recording data, etc.] for at least 10 minutes in a given hour).
6. A subjective visitor-disturbance rating (high, moderate, low, none) for each hour.

In 2018, behavior of resident raptors was not closely detailed, as not two observers spend more than two days in the field in a row.

Data was entered on both paper data sheets, and on Dunkadoo ([dunkadoo.org](https://dunkadoo.org)), an in-field electronic data entry program accessible via smart devices. This program automatically updates the HMANA's (Hawk Migration Association of North America) website, [hawkcount.org](https://hawkcount.org), at the end of each day. The results of daily counts can be viewed at <https://dunkadoo.org/explore/golden-eagle-migration-survey/gems-vista-point-2019>. The GEMS migration site on the [hawkcount.org](https://hawkcount.org) website is listed as “Golden Eagle Migration Survey” (GEMS) and hourly raptor count totals and daily weather summaries were also posted.

## Results

Observations were conducted on 9 of 31 potential count days between September 24<sup>th</sup> – October 24<sup>th</sup> 2019. A total of x individuals of eleven migratory species were recorded: Golden Eagle (199), Sharp-shinned Hawk (17), Bald Eagle (13), Rough-legged Hawk (13), Northern Goshawk (10),

Northern Harrier (5), Peregrine Falcon (3), Red-tailed Hawk (7), Merlin (2), Broad-winged Hawk (1), Coopers Hawk (1). 14 unknown raptors were also counted. Golden Eagles were counted on all 9 days, with a high of 52 on October 15<sup>th</sup>.

## **Publicity**

During the 2019 season, one site field trip was conducted on September 28, during which time 6 field trip participants joined observers at the Vista Point site. Raptor Identification courses were taught to ~80 participants, between Helena and Bozeman, during September-October 2019. We ran one article about aging Bald and Golden Eagles in our fall eNews letter.

## **Recommendations, & Ongoing Work.**

2019 brought the third consistent year of persistent snow drifts and low-lying clouds, making any west-slope observation site both hard to access and with poor visibility. Though the 2<sup>nd</sup> and 3<sup>rd</sup> week of October continue to be the height of the Golden Eagle migration, however access at this time was very poor. At the current time we recommend reconsideration of the Big Belts as a raptor migration monitoring site. It is important to remember that the purpose of the GEMS count is to obtain a standardized, credible, science-based data set to assess long-term population health and change; it is not to count as many raptors as possible. Though the site continues to afford observers exceptionally close views of both Golden and Bald Eagles, regular access and visibility are low enough to not allow the collection of accurate demographic data as birds pass south. We do recommend this site for continued use for educational and outreach purposes, as its location presents an unusually optimal location for viewing diurnal migratory raptors.

We further recommend continuing conversations within the GEMS committee, and with RVRI, to investigate the potential to move this high elevation count site elsewhere, potentially in partnership with RVRI. We believe continued raptor migration monitoring within the Helena Lewis and Clark forest corridor does complement other counts in the region and so we will seek to continually fund these efforts.

We want to thank partners for another year's worth of collaboration on the GEMS Project. The unique contributions of Montana Audubon (MA), Last Chance Audubon (LCAS), US Forest Service (USFS; Helena-Lewis & Clark National Forest) and Montana Fish, Wildlife, & Parks (FWP) made the 2019 survey season possible. We also have many individual contributors to be thankful for.