## SEABRIDGE GOLD

# Camera Monitoring of Caribou at Courageous Lake

Program Summary, 2011 to 2019

June 2020

# INTRODUCTION

#### **Overview**

Seabridge Gold Inc. (Seabridge) holds mineral leases and mining claims in the Courageous Lake area, about 240 km northeast of Yellowknife, Northwest Territories. Seabridge began exploration activities and environmental studies in 2003 and continues to actively explore the area. The Courageous Lake area lies within the historic range of the Bathurst caribou herd.

The purpose of this summary document is to give interested readers an overview of caribou monitoring that has been underway at the Courageous Lake property since 2011, and to summarize key findings to date.

#### ☆ Courageous Lake

• City - Winter Road – Road Slave Geologic Province Cambridge Bay Kugluktuk **Coronation Gulf** Nunayu Umingmaktok Kingaok Ekati Diamond Mine Wekweètì Diavik Diamond Mine **Courageous Lake** Behchoko Gahcho Kué Yellowknit Lutselk'e Great Slave Lake lay River Fort Resolution 100 200 300 KM lberta



Seabridge Gold is a Canadian based resource exploration company that began business in 1999. Since then, Seabridge has been consistently focused on evaluating, acquiring, exploring and developing gold deposits in North America. The company is headquartered in Toronto with common shares listed on Canada's TSX Exchange and the New York Stock Exchange.

The company holds a 100 percent interest in the Courageous Lake Project in the Northwest Territories, the KSM Project and the Iskut Project in Northwest British Columbia, the 3 Aces Project in Yukon, as well as several other non-core assets in North America.

Seabridge Gold believes that being a responsible and welcome member of the communities in which we operate is an essential part of our business strategy. Seabridge conducts its exploration activities in an environmentally responsible manner while providing social and economic benefits to local communities.

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# EXPLORATION AT COURAGEOUS LAKE

#### **Exploration**

Seabridge has conducted exploration at Courageous Lake on a seasonal basis since 2003. This work has included geological mapping, geophysical surveys, diamond drilling, fuel storage, winter road construction/maintenance. To support their field activities, Seabridge operates a small 49 person camp on the north shore of Matthews Lake. In 2019-20, Seabridge renewed its land use permit and obtained two water licenses to facilitate ongoing exploration activities in the Courageous Lake area.

### **Study Area**

The 33,030 hectare Courageous Lake property is located north of the tree line in the zone of continuous permafrost. The area is a mixture of lakes with rolling hills of tundra vegetation and exposed bedrock. A number of eskers run through the area. The study area is centred between Courageous Lake and MacKay Lake near the camp and known gold mineralization and extends approximately 30 km out in each direction.



### **Bathurst Caribou** Herd Population Size

The Bathurst caribou herd is one of six barren-ground caribou herds in the NWT and is typically the only herd that uses the Courageous Lake area on an annual basis. The Bathurst herd had approximately 472,000 animals in 1986 and had declined to approximately 34,000 animals by 2011, the first full year of the wildlife camera program at Courageous Lake. By 2018, the year of the most recent population estimate, the Bathurst herd had declined to 8,200 animals. Barren-ground caribou are currently listed under the *Species at Risk (NWT) Act* and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a threatened species in the NWT.





## **Bathurst Caribou Herd Range**

Bathurst caribou have historically used a broad range: calving in an area west of Bathurst Inlet and wintering below the tree line south and west of Courageous Lake. Their use of the land can broadly be classified into (1) migrations (most notably in the spring, but also in the autumn) when the animals are moving more quickly across the landscape, and (2) resident periods (calving, post-calving, summer, and winter) when the animals tend to move less and the herd tends to occupy portions of the annual range for longer periods of time. In most years, the spring migration and autumn periods are when Bathurst caribou have been observed in the Courageous Lake area. Recently there has been a shift of the Bathurst herd winter range to the north of the tree line, documented by satellite collar data. The relationship between the distribution of the herd based on satellite collar data from the Government of the Northwest Territories and the numbers of observations captured by Seabridge wildlife cameras is provided in the Results section.

#### Engagement

Seabridge worked with Indigenous land users knowledgeable with the Courageous Lake area to identify caribou trails and areas that would be suitable for camera placement. The caribou trails follow an esker system near the midpoint of Courageous Lake and along the shores of lakes in the area, primarily MacKay Lake and Courageous Lake. Cameras were also placed on high rocky areas and overlooking valleys to capture other potential travel corridors and areas used for foraging.





#### Wildlife Camera Study

Seabridge continues to monitor the Courageous Lake area to gather information about the movement patterns of caribou that may be using the area. To minimize disturbance to caribou and to be able to monitor caribou night and day, on every day of the year, Seabridge chose to use wildlife trail cameras rather than using more intrusive surveys from aircraft.

The wildlife cameras were first set up in the Courageous Lake area in 2010 and have been in operation every year since. The objectives are to use wildlife cameras to:

- monitor the timing, abundance, and location of caribou within the area;
- examine the number of caribou recorded by wildlife cameras and how it changes through time; and
- examine caribou use of potential travel corridors identified historically and through caribou trail mapping.

Wildlife trail cameras are mounted inside heavy-duty boxes to prevent damage from wildlife. Each camera is mounted on a wooden tripod, which is secured with rocks to prevent it from being knocked over by wildlife. The camera enclosures are covered with plywood caps to keep out rain and snow, and with bird spikes to deter birds from nesting on the platforms. A series of motion-triggered photos are automatically recorded whenever the camera's infrared system detects movement in the camera's field of view. Cameras are visited periodically to replace batteries and retrieve the memory cards containing photo records with date and time information.







Though cameras were deployed in 2010, the first full year of data collection was 2011. Between 2011 and July 2019 there was an average of more than 60 cameras functioning in the study area every day. Caribou were photographed at 90% of the camera locations on a total of more than 1,500 occasions. The number of caribou observations were highly variable among seasons and years.

#### **Changes Through the Years**

There are two important ways to look at the information collected by the cameras: the number of times caribou are recorded (unique observations); and the number of animals that are photographed (total individual caribou counted). Seeing one large group in a year is different than seeing 20 medium sized groups or 100 small groups. Fifty-eight percent of the unique observations recorded by cameras from 2011 to 2019 occurred in 2011 and 2012, a period when the Bathurst herd had 34,000 animals. Over 2,000 animals were counted annually in the photographs from those years, accounting for 50% of all individual caribou counted in photographs from 2011 to 2019. The lowest number of observations were recorded in 2014 (41), 2015 (24), and a low of only nine events in 2016. Despite the Bathurst herd population size being at a historic low in 2018, the 2018 and 2019 camera observations accounted for 21% of all observations and 27% of all caribou counted from 2011 to 2019.



#### Total Caribou Observations Recorded by Cameras in the Courageous Lake Study



Notes: • 2012 and 2015 population estimates: Boulanger, J., B. Croft, J. Adamczewski, D. Cluff, M. Campbell, D. Lee, and N. Larter. 2017. An estimate of breeding females and analyses of demographics for the Bathurst herd of barren-ground caribou: 2015 calving ground photographic survey. Department of Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 267

 2018 population estimate: Adamczewski, J., J. Boulanger, H. Sayine-Crawford, J. Nishi, D. Cluff, J. Williams, and L.-M. LeClerc. 2019. Estimates of breeding females & adult herd size and analyses of demographics for the Bathurst herd of barren-ground caribou: 2018 calving ground photographic survey. Department of Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 279

• 2019 population estimate: Estimate based on projection from 2018, using 2015 to 2018 geometric mean annual growth rate (0.746) from GNWT ENR surveys.

• All other years: Estimated based on geometric mean growth rate between successive GNWT ENR surveys.

2012 2013 2014 2015 2016 2017 2018 2019

Observations for 2019 are from January to July period only.

2011



#### **Seasonal Patterns in Caribou Observations**

Some seasonal patterns were consistent throughout the 2011 to 2019 period: for instance, during the calving and post-calving seasons (June 2 to June 28) caribou are well north of the Courageous Lake area, a fact which the cameras supported; there were only two observations of caribou on cameras during the calving and post-calving season in the entire 2011 to 2019 study period.

The cameras also recorded changes in caribou numbers and distribution: for instance, the camera program has recorded the decline of the Bathurst caribou population. From 2012 to 2016, as the Bathurst population declined, so did the number of caribou observations recorded by cameras.

During the nine years of monitoring, the seasons when caribou were observed changed. At the beginning of the study (2011 and 2012) the majority of caribou were observed in summer, late summer, and pre-rut periods (800 observations). However, between 2013 and 2017 caribou were only recorded 23 times in those same seasons. In 2018 there were 172 observations in the rut and post-rut periods.

The number of winter caribou observations increased between 2010 and 2019, reaching 72 observations during the winters of 2016-2017 and 2017-2018 and 95 observations in the winter of 2018-2019. The increase in winter observations is consistent with collar data that indicate that the Bathurst caribou wintered north of the tree line in those years. The map of the Bathurst winter ranges (opposite page) shows the herd wintering south of the tree line in earlier years, but wintering north of the tree line in more recent years. The map in the electronic version of this report is interactive; hover your mouse over the year-by-year legend to highlight the winter range for that year.

During the early years of the study, the Bathurst caribou wintered to the south of the tree line and their northward spring migration passed through the Courageous Lake area. Cameras recorded caribou during spring migration between 2010 and 2017. However, in the winter of 2017-2018 the Bathurst herd wintered north of the tree line (north of Courageous Lake) and no caribou were recorded during the 2018 spring migration, presumably because they were already north of Courageous Lake. In winter 2018-2019, the winter range of the Bathurst herd overlapped Courageous Lake and in the spring of 2019, there were 36 observations of caribou recorded.

#### **Use of Corridors**

When the study began it was thought that most caribou observations would occur along the observed caribou trails; on eskers and along lake shores, with few caribou observed elsewhere. While data indicated that more caribou were observed on trails than off trails, the difference was not as large as expected, with 20% to 40% more caribou observed on trails.

# SUMMARY

Seabridge has used wildlife cameras to monitor caribou in the Courageous Lake area from 2010 to the present, with several notable results:

- The cameras are an efficient, long-term way to incorporate land user information and perspectives, by placing cameras on locations identified by land users as important for caribou.
- The cameras have proven to be reliable and effective at withstanding the northern climate and recording the presence of caribou at all times of the year.
- Caribou use of the Courageous Lake area is not concentrated onto a few specific trails or corridors. Use of eskers and lakeshores is somewhat higher than areas without trails, but caribou occur throughout the area.
- A similar number of caribou are observed in the area where Seabridge is conducting mineral exploration compared to the surrounding areas.
- Between 2011 and 2016, the total number of caribou observations by cameras declined, matching the decline of the Bathurst caribou population during this period.
- Despite a declining Bathurst population, changing seasonal range use patterns have resulted in an increase in caribou observations in 2017 through 2019. When the seasonal ranges of the Bathurst herd overlap the Courageous Lake area, the number of observations increases.
- The Bathurst herd winter range included the Courageous Lake area in winters 2016-2017 to 2018-2019, and the number of caribou observations by wildlife cameras increased in those winters. The Courageous Lake camera data are consistent with Government of the Northwest Territories Bathurst caribou collar data.