Status of Woodland Caribou in Alberta

BIOLOGY 30: Concept No. 3

The status and changes in populations may be monitored quantitatively

Status of the Woodland Caribou (Rangifer tarandus caribou) in Alberta*

Background

Caribou are found in all Canadian provinces except Prince Edward Island, Nova Scotia and New Brunswick. Two ecotypes of caribou exist in Alberta: the boreal ecotype that lives year round in forested habitat and the mountain ecotype that winters in forested foothills and summers in alpine mountain habitat. (Edmonds 1991)

Woodland Caribou range includes tracts of mature to old growth forest that contain lichens, the caribou's primary winter food. Summer diets include grasses, horsetails, sedges and shrubs as well as lichens. Typically the habitat is peatland muskeg areas treed with black spruce and tamarack.

A number of factors have had an effect on Woodland Caribou populations. Predation, as well as changes in habitat quality and quantity, have served as limiting factors. An increase in the use of traditional caribou habitat areas by petroleum, natural gas, forestry and peat mining companies may have had negative effects on caribou populations.

"Current knowledge suggests that the Woodland Caribou in Alberta may be at risk. They have undergone noncycical declines in population or habitat or reduction in provincial distribution and are designated threatened under the provincial Wildlife Act."

The following activities presented have taken information, maps and tables from the *Alberta Wildlife Status Report No. 30, January* 2001 The report may be accessed on the website www.gov.ab.ca/env/fw/staus/reports/index.html

* Dzus,E. 2000 Status of the Woodland Caribou (Rangifer tarandus caribou) in Alberta. Alberta Environment, Fisheries and Wildlife Management Division and Alberta conservation Association, Wildlife Status Report No. 30. AB.

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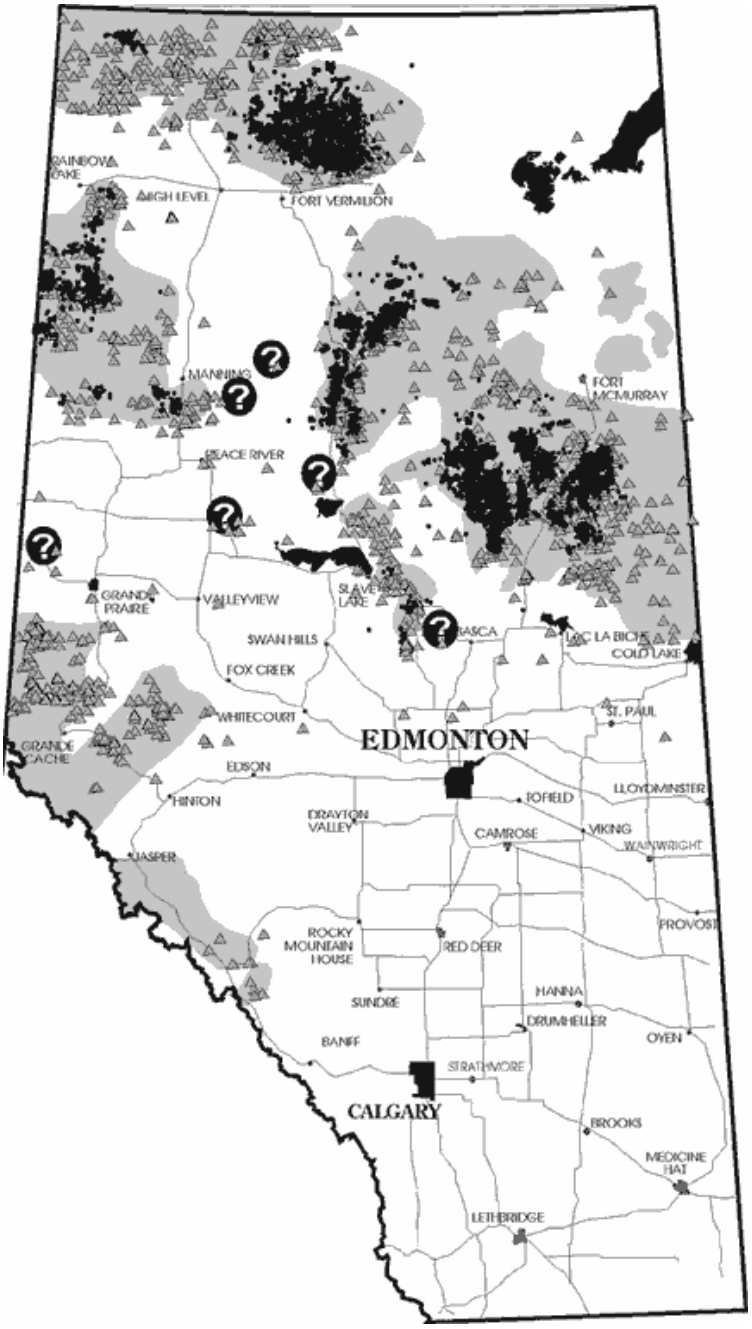
Activity 1.

Use the map showing the distribution of Woodland Caribou and the text to answer the questions that follow.



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Distribution of Woodland Caribou in Alberta. The triangles are observations of caribou from several sources (see 'Distribution' section above), the dots are telemetry points, and the question marks are areas with several sightings or potentially suitable habitat. These observation and telemetry points were recorded from 1967-2000. Caribou are very difficult to spot from the air due to their coloration and habitat, occur at low densities in large ranges, clumped distribution makes it more difficult to estimate numbers accurately -- therefore work is focused on population trends rather than total population.

Questions

1. Explain the use of telemetry in studying wildlife populations. Cite an advantage and a disadvantage of using this technology.

2. What types of information can be obtained by using telemetry?

3. What other methods of monitoring are used in population studies?

4. Describe the distribution pattern evident on the map. What biotic and abiotic factors lend themselves to this type of distribution?

Activity 2.

Caribou population dynamics are studied by monitoring adult mortality, calf production and juvenile survivorship. Adult cows begin producing young when they are 3 years old. Calf production is high (>80% of all adult females) but each female bears only a single calf annually. Studies conducted with radio collared females have shown juvenile survival (to 10 months) can vary from 7.4 to 46 calves per 100 cows in northern Alberta. Adult survival rates are over 74%.

Questions

1. Is the population strategy displayed by caribou a K-selected or an R-selected type? Give reasons for the answer selected.

2. The habitable area for caribou south of Ft. McMurray covers 20,000 square kilometers. Caribou population density is low, ranging from 0.03 to 0.12 caribou / km^2. Calculate the actual population range in this area.

3. One study used a life table approach to compare adult and juvenile survival. The report showed a rate of increase of r = -0.08 for the 20,000-km^2 area south of Ft. McMurray. What would the actual number of caribou be for this area if the density was calculated at 0.10 caribou/km^2. What would the population be one year later?

Activity 3.

Linear corridors are pipelines, roads, seismic lines or electrical power lines that may affect caribou movements, distribution and survival. These corridors allow humans and predators to penetrate areas that were previously not easily accessible. Findings have shown that mortality sites of wolf killed radio collared caribou were closer to linear corridors than the location of caribou that were alive. (James and Stuart-Smith - 2000). Woodland Caribou have shown significant avoidance distances of 250 m of seismic lines and roads and up to l,000 m of well sites.

Linear corridor density and percentage of range within 250-m lines in six northern Alberta caribou ranges. Note: all types of linear corridors included (e.g., roads, seismic lines, pipelines, etc.). Estimates are conservative due to difficulty in getting accurate / current data.

Range	Linear Corridor Density (km/km^2)	% of Study Area within 250 m of Linear Corridor
Caribou Mountains	0.7	27.9
Cold Lake	0.89	38.6
Wabasca	1.64	45.3
Red Earth	1.8	55.5
East Side of Athabasca River	2.04	51.9
Chinchaga	2.4	70.2

*Numbers are preliminary; they are not published referenced.

Questions

1. Which caribou range has the least amount of impact to it from linear corridors? Explain your answer.

2. Compare the Red Earth range with the east side of the Athabasca River. Which has the greatest density of linear corridors? How does this compare to the percent of range within 250 m of the linear corridors? Which range is greater in size?

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Answers

Activity 1. Question 1.

Telemetry is the use of radio transmitters to track movement of larger mammals.

Smaller and lighter electronic transmitters that utilize integrated circuits and memory chips are now being used. This allows for tracking of smaller animals, birds and fish.

A benefit is continual monitoring over long periods of time. More compact and longer lasting batteries extends the radio time.

Some shortcomings are the expense of the process and the trauma of live capture and collaring of individuals

Activity 1. Question 2.

Information obtained is the range the individual covers, seasonal movements and birthing areas.

New telemetry devices can be fitted with special receptors that monitor body temperature and heart rate.

Future equipment will include satellite tracking and relaying to study sites, and computer information on blood pressure, hormone levels and general health of individuals.

Activity 1. Question 3.

Other monitoring types include quadrant sampling, ear tagging of mammals, tagging of fish, banding of birds, tattooing of bears, and visual sighting of animals.

Activity 1. Question 4.

Distribution pattern is clumped. This is evident by the grouping pattern of the telemetry points and the visual sightings.

Biotic factors include food and food type distribution, climate, tree type, available niches and shelter.

Abiotic factors include water, topography, and soil type.

Activity 2. Question 1.

The caribou display K-selected population characteristics. Reasons - life span greater than one year.

- offspring are few and large in size
- delayed reproduction period
- lower juvenile mortality rate
- mortality is density dependent

Activity 2. Question 2.

Actual population range is 600 – 2,400 caribou.

D = N / S	D = N / S
0.03 = N / 20,000	0.12 = N / 20,000
N = 600	N = 2,400

Activity 2. Question 3.

The present population is 2,000 caribou. One year from now the population would be 1,840 caribou.

D = N / S	I = R x N
0.1 =N / 20,000	I = -0.08 x 2,000
N = 2000 caribou	I = -160 caribou

2,000-160 = l,840 caribou

Activity 3. Question 1.

The Caribou Mountains Range has the lowest density of linear corridors and the smallest percentage of area within 250m of linear corridors.

Activity 3. Question 2.

Red Earth Range has 1.8 km/km^2 of linear corridors compared to 2.04 km/km^2 for the east Side of the Athabasca River.

The east Side of the Athabasca River Range has a lower percentage of area within 250 m of linear corridors. This indicates it is a larger range.