



**THE HARRIS
CENTRE**
Memorial University





Investigating the Potential Role of Coyotes on Caribou Populations on the Island of Newfoundland

Report to the Harris Centre

Upon conclusion of funding under an Applied Research Grant

Dr. Yolanda Wiersma
Department of Biology

March 18, 2009



Coyote pup on logging Road, Mount Peyton area,
Summer 2008
A.J. McCue

Table of Contents

Project Profile	1
Lay Summary of Project	2
Project Activities	3
HQP Involvement	5
Knowledge Exchange	5
Research Findings	5
Future Research Directions	5



Collared young male coyote (August 2008)
N. Laite

Project Profile

Lead Researcher and Department

Dr. Yolanda Wiersma, Department of Biology

Collaborators and Students

Christine Doucet, Newfoundland and Labrador Wildlife Division

Mike McGrath, Newfoundland and Labrador Wildlife Division

Cog Pelley, Newfoundland and Labrador Outfitters Association

Student:

Tony McCue, MSc candidate, Department of Biology

Funding Resources

NSERC

CFI

Harris Centre

Dates

2007 - ?

Keywords

Coyotes, Caribou, Predator control, Population dynamics, Habitat use, Predation, Wildlife management, Mount Peyton

Locations

Grand Falls-Windsor - Baie Verte - Harbour Breton

Gander - New-Wes-Valley

Mount Peyton

Zone 12 - Exploits Valley

Zone 14 - Kittiwake

Industry Sectors

Research and Development in the Physical, Engineering and Life Sciences (Professional, Scientific and Technical Services — Scientific Research and Development Services)

Thematic Categories

Animals (Environment and Conservation — Wildlife)

Introduced Species (Environment and Conservation — Wildlife)

Departments

Biology, Faculty of Science (STJ)

Lay Summary of Project

The impact of coyotes on wildlife and agricultural resources in the province are of major concern to residents of rural Newfoundland (sheep farmers, outfitters, hunters, trappers). The coyote is a relatively recent arrival on the island of Newfoundland, and determining how to best manage this predator requires both an understanding of its ecology, and of the dimensions of human-coyote relationships.

This project is investigating the biology and ecology of coyote-caribou dynamics in the Mount Peyton area (central Newfoundland, south of Bishop's Falls). Caribou are an economically important species in the province, and are currently in decline. One of the possible reasons for caribou decline is increased predation by coyotes. This project is being conducted in close collaboration with biologists from the provincial Wildlife Division, as well as with local outfitters and trappers. It is anticipated that findings from the proposed project will directly inform policy and management decisions relevant to wildlife management in the province of Newfoundland and Labrador. An understanding of the potential impact of coyotes on caribou populations will assist the Wildlife Division in developing management strategies that will contribute to the sustainability of wildlife resources in the province and to the development of the hunting/outfitting industry.

The objectives of the proposed project are as follows:

- 1) To investigate the potential role that coyote (*Canis latrans*) may play in the recently observed declines in woodland caribou (*Rangifer tarandus*) on the island of Newfoundland. These declines are having a negative impact on the hunting/outfitting economy in rural Newfoundland.
- 2) To determine what percentage of coyote diet is comprised of caribou of different ages/sex and to predict what impact this predation will have on caribou populations (and by extension, the hunting/outfitting industry) over the long term.

Over the past year, we have conducted a summer and winter field season. In the summer field season we successfully deployed 1 GPS collar, and observed coyote pups in the area, as well as made a number of sightings of caribou. As well, coyote scat was collected from across the study area, which is being analyzed for diet composition. Scats are also being subjected to DNA analysis to confirm identity as coyote (coyote scat can sometimes be mistaken for fox) and hopefully to identify how many individual coyotes are within the area. Winter field work has consisted of transect surveys to identify prey densities, as well as snow tracking to identify coyote behaviour, movement, kill locations and den sites.



Female caribou and calf, Mount Peyton area, summer 2008

N. Laite

Project Activities

Summer Field Work

Funds from the Harris Centre were used to hire a field assistant (an undergraduate Biology major as a summer student field research assistant) and to cover partial costs of field work (vehicle rental costs). Tony McCue and his assistant were based out of a DNR-owned cabin located off the Bay d'Espoir highway. They were in the field continuously from mid-June 2008 to the end of August. Summer field work consisted of setting and checking leg hold traps (for the purposes of live catching coyotes and deploying GPS collars on them), scat collection, and general reconnaissance work to familiarize themselves with the terrain. This was the first field season for Dr. Wiersma's research program, so the focus was on reconnaissance and identifying potential suitable locations for winter field work.

In total, about 60 scats were collected, georeferenced, preserved, and returned to campus where they are undergoing DNA analysis by an honours student under the supervision of Dr. Dawn Marshall, Department of Biology. DNA analysis will confirm that the scat is coyote in origin, since it can sometimes be mistaken for lynx or fox scat in the field. If there is enough genetic variability, it may be possible to identify how many individuals animals are represented by the scats. Tony McCue will then use the scats to analyse coyote diet (via an examination of hairs in scats).

Despite intensive trapping effort, only 1 coyote (a young male) was trapped and collared. The GPS collar will collect location data every 4 hours for up to one year. When the animal dies, the collar will emit a mortality signal. The collar has also been engraved with Dr. Wiersma's contact info in case the animal is shot or found by anyone. Staff from the Wildlife Division who routinely fly the area have been given the collar frequency and will attempt to locate the animal for us on an opportunistic basis.



Setting leghold trap
A.J. McCue



Attaching GPS collar to captured coyote
N. Laite

Winter Field Work

Funds from the Harris Centre Applied Research Grant were used to cover accommodation costs and partial field expenses (vehicle rental costs). Tony McCue and a volunteer field assistant, Marie Winsa, from Sweden were based out of Bishop's Falls from January 12 through to March 31, 2009. They have been carrying out track surveys along triangular transects (3 km/side) randomly distributed throughout the study area. This will enable an estimate of prey density. In addition they have continued to collect scat. The remainder of the winter work has been following coyote tracks as they have been encountered. Tracking work involves following coyote tracks forwards and backwards, mapping the path and noting any signs of activity. Several winter kills sites and one den have been located via the tracking work.

We had hoped to use the winter season to deploy additional collars but have been frustrated by a lack of bait (road kill) and limited helicopter time. Two days of flying confirmed that the terrain was too heavily forested for aerial netgunning and future work should focus on trapping following winter tracking to determine high-use areas.



Snowmobiling across study area
A.J. McCue



Coyote den, Winter 2009
A.J. McCue

HQP Training

HQP have gained a range of experiences through this project. The graduate student involved, Tony McCue has extensive field work experience, but this project is the first where he is solely in charge. Moreover, because it is a new project with a new researcher, there has been a great deal of planning work and equipment purchase to be carried out. Thus, he has gained skills in project planning and management, including budget management, purchasing, and collaborating with government scientists. He has also had the opportunity to attend the GEOIDE summer school (early June 2008), where he took a week long intensive course in Object Tracking and Modeling Movement.

The two field assistants have gained skills in field work. The summer student learned about trap setting and baiting as well as animal handling techniques. The winter student has learned about tracking and transect surveys. A third undergraduate (not directly involved with this project) is learning DNA extraction and analysis techniques with our scat samples, under the supervision of Dr. Dawn Marshall.

Knowledge Exchange

We have engaged in a number of formal knowledge exchanges. Tony McCue and Dr. Wiersma were keynote presenters at the Newfoundland and Labrador Outfitters Association meeting in Corner Brook November 29-30. We presented on work to date and on future research plans. The meeting also afforded many opportunities for informal networking with the outfitting community. Our presentation was featured in an article in the [Western Star](#).

Tony McCue made a formal presentation to staff at the Wildlife Division in Corner Brook in late May 2008. He received valuable feedback on his proposed field work.

In addition, we have had informal conversations throughout the project with Wildlife Division staff, both in the St. John's and Corner Brook offices.

Research Findings

At this point we have not undertaken any intensive analysis of the field-collected data, thus results are pending. Analysis of spatial data collected via the winter tracking and track surveys will commence in May 2009. DNA analysis is ongoing and we should have results from all scats by summer 2009.

Future Project Directions

We were unable to deploy enough GPS collars to give Tony a sufficient sample size for his Masters thesis. Instead, he will be using data lent from the Wildlife Division as well as data collected from scats and track surveys to complete his thesis. Dr. Wiersma will continue to try to facilitate collar deployment over a longer time frame, with the cooperation of the Wildlife Division. Collar deployment has proven to be unsuccessful in the summer months. Winter deployment requires helicopter time, current budget does not allow for extensive helicopter time, thus Dr.

Wiersma will rely on opportunistic deployment opportunities when Wildlife Division staff is flying. They have indicated a willingness to assist in this manner. Thus coyote collar data will take longer to obtain than initially hoped for. Nonetheless, it is hoped that in several years enough data will be available from collared animals to address some of the research questions about coyote habitat use and territoriality.

In the mean time, we will use existing data from the Wildlife Division to develop predictive habitat models for coyote habitat use (Tony McCue) and caribou habitat use (future PhD student). We will also use data collected on this project for diet analysis, and may carry out work in the near future to survey the prey base more intensively in the field. Dr. Wiersma anticipates building on the current project to advance knowledge about coyote-caribou interactions and to better understand the range of factors that are contributing to caribou declines on the island of Newfoundland.

In addition to the future ecological work described above, plans are underway to link the coyote work with a larger GEOIDE-funded project that Dr. Wiersma is involved with (Dr. Renee Sieber, McGill University, PI). The project led by Dr. Sieber ("The Participatory Geoweb for Engaging the Public on Global Environmental Change") is examining how the general public uses Web 2.0 applications to engage with environmental and resource issues. Dr. Wiersma currently has an MSc(Env) student whose project results are being used to develop a web portal for public engagement with the issue of *Erioderma* (globally rare Boreal Felt lichen). The GEOIDE project led by Dr. Sieber has recently been renewed for three years, and under this renewal, Dr. Wiersma and a team of students (current and future) will be expanding the web portal to create interfaces for the general public to upload observations about a range of species, including coyote.

Acknowledgements

Thanks to Phil and Christine Lingard of Brookdale Country Inn for supplying logistical support and welcoming accommodations for the winter field season. Thanks to the Department of Natural Resources for use of their cabin for summer work, and to the Wildlife Division for in-kind support with ATV and snowmobiles. Christine Doucet and MikeMcGrath of the Wildlife Division provided helpful input on the project.



Caribou and coyote track, Summer 2008

N. Laite



THE LESLIE HARRIS CENTRE OF REGIONAL POLICY AND DEVELOPMENT

1st Floor Spencer Hall, St. John's, NL Canada A1C 5S7

Tel: 709 737 6170 Fax: 709 737 3734 www.mun.ca/harriscentre

THE HARRIS CENTRE Memorial University

