

**ELK-AGRICULTURE CONFLICTS
IN THE GREATER RIDING MOUNTAIN ECOSYSTEM:**

Building Bridges between the Natural and Social Sciences to Promote Sustainability

by

Ryan K. Brook

A thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfillment of the degree of

DOCTOR OF PHILOSOPHY

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"Complex problems have simple, easy to understand wrong answers."
Grossman's Law

ABSTRACT

Successful mitigation of human-wildlife conflicts requires an approach that incorporates both the ecological aspects of wildlife and the social considerations of the affected stakeholders and these must be considered in an integrated fashion at multiple temporal and spatial scales. In this dissertation, I examine the relationship between farmers around Riding Mountain National Park (RMNP) in southwestern Manitoba and the regional elk (*Cervus elaphus*) population, in order to better understand and resolve these long-standing conflicts more effectively. Local perspectives were documented throughout this study, initially through 40 community meetings in 2000 and 2001 prior to formal data collection, then through a mail-out survey in 2002, and later through participatory mapping exercises from 2003 to 2006. A longitudinal analysis of historical information regarding elk-agriculture conflicts using the interviews and government letter files indicated that diverse types of conflicts have occurred annually for the last 127 years. Issues related to bovine tuberculosis (TB) in elk in the last 15 years have been some of the most intense conflicts ever occurring, but these are based on previous conflicts and they have further undermined the already strained relationship between farmers and RMNP. The most important factor associated with high concern regarding bovine TB was the frequency that farmers observed elk on their land. To examine the biophysical aspects of elk interactions with agriculture, 212 wild elk were captured from 2002-2005 using a net-gun fired from a helicopter and given a GPS satellite collar (n=25) or VHF transmitter (n=187). Overlap in space use between elk and cattle was high in summer and low in winter based on both the collar data and local knowledge, though farmers identified higher levels of overlap throughout the year. During the spring elk

calving period, the home ranges of 73% of the parturient elk remained entirely within protected areas, while 6% were exclusively on farmland, and 21% included both. The proportion of the elk population calving on farmland continues to increase from near zero in the 1970s. Hay yard barrier fences are the most effective and widely accepted management tool in use to mitigate elk-agriculture conflict, but modifications to the process of allocating and monitoring fences are needed. Indeed, all aspects of the management of elk-agriculture interactions require greater levels of communication and collaboration between government agencies and local stakeholders. I also advocate taking an adaptive, science-based approach to managing human-wildlife conflicts that focuses on both the social and natural sciences as mutually contributing to our understanding of the problems and generating meaningful solutions. This is one of few studies that makes use of local knowledge and conventional ecological data together, and demonstrates the contributions of both in better understanding the temporospatial aspects of wildlife-human conflicts and their socioeconomic and conservation implications.

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“The easiest way for me to grow as a person is to surround myself with people smarter than I am.” – Andy Rooney

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elk over the course of three years. I thank Marc for his advice in general and for challenging my perspectives on local knowledge. Were it not for Norm, it is unlikely I would have survived my masters, never mind tackling a PhD, so I give many thanks to him for serving on both of my graduate committees and for inspiring me, 'big time'. I also greatly appreciate the input of my external examiner, Dr. Michael Quinn from the University of Calgary for reviewing this dissertation and providing unique and valuable insights.

When I came to Riding Mountain, I was warned that the farmers are 'difficult' to work with, but nothing could be further from the truth. I have worked closely with many local farmers over the last six years and their contribution to all aspects of this thesis and my training as a scientist cannot be overstated and I thank particularly John Whitaker, Ray Armbruster, Calvin Pawluk, and Bengt Schmidt who contributed to this research immeasurably.

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"Setting an example is not the main means of influencing others, it is the only means of influencing others." -Albert Einstein

DEDICATION

To Kellie, you make everything possible and bring meaning to everything that I do.

To Evan, my son, you are the future of the world and show me what is really important.

To Mom, because more than any other person, you made me who I am.

To Dad, for teaching me a respect for animals that no other I person that I know has, and for common sense and hard work.

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"What would you do if you knew you could not fail?" -Author Unknown

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