



Global Re-introduction Perspectives: 2013

Further case-studies from around the globe
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IUCN/SSC Re-introduction Specialist Group (RSG)





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Published by: IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

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Citation: Soorae, P. S. (ed.) (2013). *Global Re-introduction Perspectives: 2013. Further case studies from around the globe*. Gland, Switzerland: IUCN/SSC Re-introduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi. xiv + 282 pp.

ISBN: 978-2-8317-1633-6

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The restoration of elk in Ontario, Canada, 1998 - 2012: research and management implications

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Introduction

Elk (*Cervus elaphus*) or wapiti were historically distributed across much of North America. However, during the 1800s they were extirpated from much of their range, including Ontario, Canada, presumably due to unregulated harvesting, changes to habitat associated with settlement, and extermination by landowners due to elk competition with livestock and damage to crops and property. Numerous restoration projects were initiated across North America during the early 1900s in an effort to re-build elk populations. One restoration project in Ontario during the 1930s was successful at restoring elk to the province. However, an extinction order was issued during the 1940s and 1950s due to the incorrect belief by provincial officials that elk were spreading giant liver flukes (*Fascioloides magna*) to cattle (Rosatte *et al.*, 2007). As a result, elk were legally hunted in Ontario until 1979. A few of those elk survived and during the mid-1990s, two small herds of about 50 elk (offspring of surviving elk) still existed in the Burwash area of central Ontario. During 1998 to 2001, 443 elk acquired from Alberta, Canada, were released in 4 areas of Ontario in an attempt to bolster the Burwash area herds and restore elk to other areas of Ontario (Rosatte *et al.*, 2007). Research projects were implemented at all release sites to provide data for the effective management of elk in Ontario and in 2010 a provincial Elk Management Plan was implemented.



Cow, Calf and bull elk © R. Rosatte

Goals

- **Goal 1:** To restore a species that had been extirpated from Ontario, Canada during the 1800s.
- **Goal 2:** To determine the environmental impact of restoring elk in Ontario.
- **Goal 3:** To implement research and monitoring programs that would provide data for decision making regarding the management of elk in Ontario.

- Goal 4: To provide social and economic benefits e.g. recreational opportunities such as harvesting and viewing, for the residents of Ontario.
- Goal 5: To enhance biodiversity in Ontario.

Success Indicators

- Indicator 1: Sustainable elk populations in Ontario.
- Indicator 2: Mortality of elk is low and elk productivity and calf survival is high.
- Indicator 3: Elk interactions with humans are minimal.
- Indicator 4: Elk competition with other ungulates such as deer is minimal.
- Indicator 5: Elk damage to the environment is minimal (including disease/ parasite spread).

Project Summary

Feasibility: Historically, elk were found in some areas of Ontario, suggesting that certain habitats in the province could support elk populations. During the mid to late 1990s, the Plan for the Restoration of Elk in Ontario was drafted and approved by the Ontario Ministry of Natural Resources (OMNR). The plan identified six broad geographic areas of the province where elk could be potentially restored and the recommendation was that at least 200 elk should be released in each area selected as a release site. A habitat supply model was used to determine which areas of the province could support elk populations. Each area was ranked according to elk ecological variables, mortality risk, potential for elk interaction with humans, and logistics of restoring elk in that area (Bellhouse & Broadfoot, 1998).

Implementation: Ontario's elk restoration program was a multi-partnered collaboration with members from provincial and federal governments, colleges and universities, private organizations, and volunteers. Elk Restoration Advisory and Technical Committees were established to coordinate the overall implementation and delivery of the Ontario elk restoration program. In addition, Local Implementation Committees (LIC's) were established in the release areas to oversee release site logistics. Elk were captured and processed (tested for diseases such as brucellosis and bovine tuberculosis, administered anti-parasitic agents, sexed and aged, and were fitted with radio collars and ear-tags) at Elk Island National Park, Alberta (Rosatte *et al.*, 2007). Elk were not accepted for shipment to Ontario unless they were declared disease-free by Canadian Food Inspection Agency (CFIA) veterinarians. Elk were shipped to Ontario via Rocky Mountain Elk Foundation (RMEF) trailers or commercial stock trailers. Upon arrival in Ontario elk were placed into holding pens to recover from the 1 to 2 day journey. A total of 443 elk were released after a variable holding period at four areas in Ontario: the Lake of the Woods (LOW) area near Kenora (104 elk), the Lake Huron North Shore (LHNS) area near Blind River (47 elk), the Nipissing/ French River (NFR) area near Sudbury (172 elk), and the Bancroft North Hastings (BNH) area near Bancroft, Ontario (120 elk) (Rosatte *et al.*, 2007). The Ontario elk restoration plan had identified six potential areas in Ontario that could receive elk. However, following a risk assessment, a moratorium on the shipment and release of additional elk in Ontario was implemented in 2001 due to the perceived



Rick Rosatte with drugged elk © J. Neuhold

risk of importing Chronic Wasting Disease (CWD) into the province. Ontario currently (January 2013) remains free of CWD.

Post-release monitoring:

Following the release of the elk in Ontario during 1998 to 2001, program staff, volunteers, college and university students, monitored their movements and survival using radio-telemetry as most of the elk were collared. Twelve graduate student programs were

also initiated at four Ontario universities during 1998 to 2012 to study the dynamics of the elk herds at the four elk release areas. From 1998 to 2004, mortality of released elk was about 41%. Causes of mortality included predation by wolves (primarily in the NFR and LOW release areas), illegal shooting, collisions with vehicles, infections, and emaciation (Rosatte *et al.*, 2007). However, mortality has since declined as elk became acclimated to their new home in Ontario. It was also found that in some of the release areas the length of time the elk were kept in pens prior to release had an effect on their dispersal distance. In fact, extended holding periods (up to 4 months) promoted philopatry (Ryckman *et al.*, 2010). Another research study determined that there was a moderate amount of dietary overlap between elk and resident white-tailed deer (*Odocoileus virginianus*) in the BNH release area (Jenkins *et al.*, 2007). McIntosh *et al.* (2007) found that about 59% of elk sampled in the BNH release area were infected with meningeal worm (*Parelaphostrongylus tenuis*); however, the full impact of that parasite on elk survival in Ontario has yet to be determined (Bellhouse & Rosatte, 2005). Research on the dynamics of elk populations in the four release areas in Ontario continues to-date (2013).

A provincial Elk Management Plan was developed with public input and implemented by OMNR in 2010. This plan aligns with the Cervid Ecological Framework which is in place to manage cervids (moose, elk, deer, caribou) at the ecosystem or landscape level in Ontario. Monitoring of elk to date has revealed that the BNH and LHNS elk populations are doing extremely well. In fact, a hunt was initiated in the BNH area during 2011 to assist with managing the herds at a desired population objective (400 to 600 elk in the BNH core release area which is about 2,500 km²) and provide recreational opportunities to Ontarians. The elk hunt may also help to reduce human/elk conflicts especially on agricultural lands in the BNH area. Elk in the NFR area suffered high mortality during the initial stages of restoration due to wolf predation and a variety of other mortality factors. That population has struggled but currently (2013) appears to be recovering.

However, the LOW elk population appears to be struggling due to a variety of factors. The provincial elk population estimate for the four core elk ranges in Ontario during 2012 was 648 to 916 elk.

Major difficulties faced

- Transport of elk in trailers for 24 to 58 hours continuous driving during winter conditions was stressful to elk as well as the truck drivers.
- Elk escaped from one of the release area pens (BNH) on day 1 of the holding period and dispersed over a 27,000 km² area (Rosatte *et al.*, 2007).
- Elk mortality was initially high following release due to a number of factors including wolf predation, drowning, collision with vehicles, illegal shooting, infections and emaciation.
- Had to address concerns raised by naturalist groups and hunters regarding the environmental impacts of releasing elk in Ontario.
- Had to assess the risk of Chronic Wasting Disease being imported into Ontario via shipment of elk from Alberta.
- Conflicts with area farmers has become an on-going challenge.
- Divisive issue as to whether elk should have access to supplemental food sources.
- Acknowledged the potential for restored elk to interbreed with escaped captive elk, red deer, and hybrids in Ontario and attempts have been made to remove escaped captive animals from the landscape.
- Determining if a re-introduction is successful and deciding when to cease efforts to sustain a herd/population that is facing continued decline.

Major lessons learned

- Elk should be placed in holding pens prior to release for 1 to 4 months to allow them to recover from the stress of relocation, acclimatize to their new environment, and promote fidelity to the release site area.
- Prime animals should be selected for restoration to maximize productivity during the initial stages of restoration.
- Elk released in areas of high predator (e.g. wolves) density will in all likelihood experience high mortality during the initial stages of restoration.
- Hunters need to be educated to be certain of their target when elk are released into areas



Helicopter preparing to capture elk for radio collaring near Bancroft, Ontario © Rick Rosatte

Mammals

where there are hunting seasons for species such as deer and moose, otherwise elk mortality due to illegal shooting will likely be high.

- Human/elk conflicts will occur in areas containing agricultural croplands, and co-operative work is needed to develop effective tools for minimizing conflicts.
- If elk are restored to an area, populations need to be monitored and a comprehensive elk management plan is imperative to deal with disease/parasite management as well as human conflict issues.

Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

Reason(s) for success/failure:

- Dispersion of elk away from the release site areas resulted in some animals not contributing to productivity.
- Wolf predation combined with other mortality factors has suppressed population increase during some years in the Lake of the Woods and Nipissing/French River elk release sites.
- Little predation of elk combined with high survival and productivity has resulted in significant population increases in the Bancroft North Hastings and Lake Huron/North Shore elk release areas.
- During the initial stages of the restoration program (1998 - 2004), illegal shooting accounted for 25 known elk mortalities.
- There was a moderate level of dietary overlap between elk and resident white-tailed deer.
- Some undesirable interactions with humans e.g. in some areas, elk/human conflicts have occurred in the vicinity of agricultural lands.
- Overall, the program was a success due to the collaboration of nearly 20 organizations, including provincial and federal governments, universities, private organizations, and volunteers.
- A provincial Elk Management Plan was implemented to provide direction to manage elk in Ontario.
- Elk research and monitoring programs provided input for elk management decisions.

Acknowledgments: The Ontario elk restoration and research program was a collaborative effort involving the following organizations: the Ontario Ministry of Natural Resources, the Ontario Federation of Anglers and Hunters, the Canadian Food Inspection Agency, Parks Canada, Elk Island National Park, Cambrian College, Trent University, Lakehead University, Laurentian University, the University of Guelph, Sault College, French River Resorts Association, the Rocky Mountain Elk Foundation, the Ontario Fur Managers Federation, Safari Club International (Ontario and Ottawa chapters), as well as the numerous volunteers associated with each elk release area. The manuscript was reviewed by the following OMNR staff: Dr. C. J. Davies, D. Stetson, V. Ewing, E. MacDonald, J. Holder and G. Lucking.

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