



Management Plan for
Elk in Yukon
2016

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Management Plan for Elk in Yukon

As recommended by the Yukon Fish and Wildlife Management Board.

Approved by:



Hon. Wade Istchenko
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Government of Yukon

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Overview

This plan provides an adaptive framework to guide the management of the Takhini and Braeburn elk herds in Yukon. The focus of this plan is to keep the two elk herds healthy, to manage their habitat and range carefully, and to further understand and mitigate the impacts of elk presence on the landscape.

Considerable work has been completed to implement the 2008 elk management plan. Much has been learned about elk population size and methods for counting elk, range conditions, and their seasonal diet compared to other ungulates. Currently there are approximately 200 elk in the Takhini herd and 60 in the Braeburn herd. Elk have continued to have conflicts with agriculture and there are concerns about motor vehicle accidents on the Alaska and North Klondike highways.

Elk in southeastern Yukon are considered to be naturally colonizing and are not considered in this plan. As well, captive elk on game farms and at the Yukon Wildlife Preserve are not directly considered in this plan. This plan follows the *Management Plan for Elk (Cervus elaphus) in the Yukon* (2008) and the *Management Plan for the Takhini Valley Elk Population* (1990).

Background

The Management Plan Review

A review of the *Management Plan for Elk (Cervus elaphus) in the Yukon* (2008) began in February 2015. The review was largely in response to concerns from the agriculture community over increasing conflict between elk and agriculture in the Takhini Valley the previous winter.

The review of the 2008 management plan was led by Environment Yukon. The Champagne and Aishihik First Nations, Ta'an Kwäch'än Council, Little Salmon/Carmacks First Nation, Yukon Fish and Wildlife Management Board, Alsek Renewable Resources Council, Laberge Renewable Resources Council, Carmacks Renewable Resources Council, Yukon Agriculture Branch, Yukon Game Growers Association, Yukon Agricultural Association, the Yukon Agricultural Industry Advisory Council, and Yukon Fish and Game Association participated in the review. Kwanlin Dün First Nation and the Yukon Outfitter Association were also invited to participate. Kwanlin Dün First Nation provided input on the draft plan.

An initial workshop was held in Whitehorse on February 25 and 26, 2015 to review the 2008 management plan and identify current issues and opportunities from the perspectives of participants. A second workshop was held in Whitehorse on April 16 and 17, 2015. The purpose of this workshop was to discuss specific concerns regarding elk conflicts with agriculture in the Takhini herd range. Two subsequent meetings were held on April 23, 2015 and May 13, 2015. Participants provided comment on draft plan and it was submitted to the Yukon Fish and Wildlife Management Board for their consideration in June 2015. The Yukon Fish and Wildlife Management Board held a public review in September and October of 2015 and recommended the plan to the Minister in November 2015.

Elk in Yukon

Elk belong to the family Cervidae and are the second largest species of deer in the world; only moose are larger. Elk migrated to North America via the Beringian land bridge, likely more than 10,000 years ago. They were a member of the large mammal fauna in Yukon during the late Pleistocene and on through the Holocene. Fossil remains found in Yukon date their occurrence as recently as about 1500 years ago. In more recent times, elk were distributed in North America from Ontario to British Columbia.

Elk in Yukon are at the northern edge of their range. Their recent return to Yukon is a function of both natural movement of animals and deliberate introduction by humans, depending on the population. Currently there are three populations of elk in Yukon, found in the Takhini Valley, Braeburn area, and southeastern Yukon.

In the late 1940s, the Yukon Fish and Game Association successfully lobbied the Commissioner of Yukon to introduce elk in southern Yukon. The aim was to provide new hunting opportunities for local hunters so that harvest pressure on other ungulates would eventually be reduced. Nineteen elk from Elk Island National Park, Alberta, were released near Braeburn Lake in 1951, followed by another 30 animals in 1954. In the 1990s more elk were released in the Braeburn Lake (73 animals), Hutshi Lakes (28 animals) and Takhini River valley (18 animals) areas. These elk have remained roughly between Whitehorse and Carmacks to the north (Braeburn herd)

and Whitehorse and Haines Junction to the west (Takhini Valley herd). The Braeburn and Takhini Valley herds are considered, for management purposes, two separate populations. It is not well known if animals move between the two herds. Small mixed groups and lone bulls are sometimes seen relatively far from the known ranges of the two herds.

In some years elk naturally occur in small numbers in southeastern Yukon along the British Columbia-Yukon border. These animals likely move up naturally from British Columbia where populations are growing and expanding their range. In the southwestern Northwest Territories, elk have been seen as far north as 62°N and sightings have become more regular in recent years. The extent and occurrence of elk populations in southeastern Yukon are unknown, but it is believed that they are not a regular part of Yukon fauna in that region, with the possible exception of the extreme southeast (LaBiche and Beaver River valleys).

Population Status

Monitoring of elk in Yukon has not been intensive or systematic since their release. A quarter of a century after the initial introduction, observations suggested that elk persisted in small numbers and the project did not appear to be a success as the population did not grow large enough to provide harvest opportunities. Elk consistently remained below 100 animals until about the early 1990s. However between 1989 and 1994 additional elk – sourced from local game farms – were released into the wild and numbers appeared to increase, especially in the Takhini Valley.

In 2008, the Takhini herd was estimated to be approximately 200 animals. The aim of the 2008 management plan was to not let the herd exceed the size at the time, which would provide hunting and wildlife viewing opportunities, while acknowledging and addressing concerns about collisions between elk and vehicles, conflicts between elk and agriculture, and the potential impacts of elk on other species and the land.



In 2007, Environment Yukon equipped elk with radio-collars to monitor distribution and better estimate population parameters. Winter ticks were found on elk immobilized during the radio-collaring operation. Recognizing that winter ticks were already present at low densities in Yukon, Environment Yukon focused efforts on reducing tick loads on elk and limiting the potential for transmission of winter ticks to other ungulates. Elk were penned during the spring of 2008 and 2009 and released after ticks had dropped. Penning during the calving period resulted in the release of 50 calves (92 cows) in 2008 and 55 calves in 2009. This was considered an increase in recruitment and was believed to have resulted in an increase in the size of the herd. Harvest was used to bring the population numbers down. In 2015 it estimated that there are approximately 200 elk in the Takhini herd and 60 elk in the Braeburn herd.

Management Regime

The Minister of Environment has the authority to manage elk and their habitats in Yukon under the *Wildlife Act*. In 2008 elk were removed as a *specialty protected wildlife* under the act and listed as a *big game animal*. This change allowed for harvest of elk by permit hunt authorization. The *Wildlife Act* does not allow any opportunities for killing elk to defend property. The Minister, with input from the Yukon Fish and Wildlife Management Board, renewable resources councils, and First Nation governments may consider other measures not described in this management plan if circumstances require. The Minister's authority to respond to an emergency situation is enabled in the act.

Under the Umbrella Final Agreement elk are considered a transplanted species and Yukon First Nations do not have subsistence hunting rights. Harvest allocation for First Nations is based on a calculation of settlement land in the range of each herd.

In 2008 a harvest management plan was developed which described harvest sharing between licenced hunters and First Nations. The first elk hunt occurred in the fall of 2009 and annual harvest is adaptively managed based on available information through regulations established under the *Wildlife Act*.

Three management zones were created to enable the elk hunt: core, buffer and exclusion. The core is the area historically used by the majority of elk in both herds. The buffer is east, west, and south of the Takhini core area. This area is used less than the core, although animals are known to use the buffer, especially in the winter. The buffer also contains a large number of agriculture dispositions and is the area where the majority of elk-agriculture conflicts occur. The exclusion zone is in place to limit elk range expansion and includes the remainder of Yukon.

Kusawa Park was identified through the Kwanlin Dün and Carcross/Tagish First Nation final agreements. The northern boundary of the park overlaps with the southern boundary of the Takhini elk herd range including core and buffer areas. Planning for the park occurred at the same time as the development of the elk plan and further discussion may be required to harmonize these plans with respect to elk and their habitats.

Management Goals, Objectives and Actions

The following management goals and objectives reflect and further define the values around the management of the Takhini and Braeburn elk herds. To assist in plan implementation, specific actions to reach these goals and objectives are identified.

Through considerable discussions in the development of this plan, all parties agreed to the goal of maintaining elk on the landscape. The overall aim of this plan is to maintain self-sustaining populations of elk on the landscape to provide wildlife viewing and harvest opportunities, while acknowledging and addressing concerns related to elk-agriculture conflicts, collisions between elk and vehicles, and impacts of elk on other species and ecosystems.

The strong interest in directing resources for fish and wildlife management towards subsistence species has been reiterated by the parties through many discussions over the years. However, Yukon government's responsibility for managing wild elk and the requirement to direct resources to the management of these herds is also acknowledged. These interests are largely reflected in budgets and resource allocation and are also reflected in the actions described in this management plan.

Goal 1: Ensure the Takhini and Braeburn elk herds remain healthy and self-sustaining

Goal 2: Carefully manage elk habitat and range in the Takhini and Braeburn areas

Goal 3: Provide for greater human use, appreciation, and understanding of elk

Goal 4: Acknowledge and address concerns about the presence of elk on the landscape



GOAL 1 Ensure the Takhini and Braeburn elk herds remain healthy and self-sustaining

The primary goal for these two herds is to manage population numbers to maintain elk on the landscape. In the 2008 plan, the target population size and distribution of both herds was determined by the planning team with the interest in limiting the spread of winter ticks, reducing conflicts between elk and agriculture, reducing collisions between elk and vehicles, and addressing concerns about impacts of elk on other species.

This plan does not identify a target population size but identifies how to best address the challenges of having elk on the landscape, while recognizing that a minimum number of animals are required to maintain self-sustaining populations. It is difficult to identify with a reasonable level of certainty the minimum number of elk required to sustain these herds. Therefore, management decisions should be evaluated based on the level of risk associated with various population sizes. Specifically, the smaller the population size, the greater the long-term risk of extirpation. Small populations are subject to rapid declines for three main reasons:

- Fluctuations in birth and death rates between individual animals;
- Environmental fluctuations (e.g. variation in predation, competition, disease, and food supply) and unpredictable large-scale events (e.g. fires, storms, droughts, etc.); and
- Loss of genetic variability and related problems.

For management decisions to be evaluated based on risk requires information on population dynamics, health, and genetic variability recognizing that decisions should be re-evaluated when new information becomes available.

Elk do not appear to suffer from decreased genetic variability and no abnormalities have been reported in other elk herds with some of the lowest recorded genetic variability. However, this does not guarantee that there will be no long-term effects, particularly if populations remain small and isolated. There is no indication that these two herds suffer from effects of low genetic diversity. Collection of DNA samples for analysis is not a priority at this time but may be considered in the future.

Objective 1: Monitor elk populations in the Takhini and Braeburn areas to ensure populations are self-sustaining

Since the introduction, the Braeburn herd has fluctuated and currently remains stable at approximately 60 animals. The lack of population growth suggests that harvest and land-use management decisions should focus on preventing this population from declining.

The Takhini herd has increased since its introduction. The herd is currently estimated at approximately 200 elk with a predicted growth rate of 0% to 3%. The growth rate is predicted to decline to -0.5% to 2.5% if the population falls to 180 elk and -1% to 2% if the population has fewer than 160 elk. Variation in recruitment makes it difficult to predict the actual response of the population; however, these values provide a rough estimate of the level of risk associated with reducing the herd size to address conflicts between elk and humans.

The interest is to maintain self-sustaining elk populations in the Takhini Valley and Braeburn areas while using the range of tools identified in this plan to manage

impacts of elk. Although this plan does not identify a target population, a new management regime would be required if the Takhini herd declines to 100 and 120 animals. At this low number, there are concerns that the population would not naturally sustain itself. Mitigating conflicts without precipitating a decline in the population is the ideal situation, however it is recognized that the management approach outlined in this plan will likely result in a decline in the size of the Takhini herd. Successful implementation of the plan would result in maintaining self-sustaining elk herds while greatly reducing conflicts.

Actions
When required, conduct late-winter surveys to monitor total population size, sex-ratio, and recruitment. Survey intervals should be shorter with smaller herd sizes.
Update population models with any new population data.
Revisit management approach if the Takhini elk herd declines to between 100 and 120 animals.

Objective 2: Maintain healthy populations of elk

Diseases like chronic wasting disease, bovine tuberculosis, malignant catarrhal fever, and Johne's, as well as infection with winter tick, can seriously impact elk, other wildlife species, and livestock. Potential impacts include population declines, loss of harvest opportunities, and costs for disease management or eradication efforts. Disease control or eradication in wildlife is very difficult and therefore emphasis of disease management is placed on prevention, monitoring, and early detection.

Yukon government is responsible for monitoring wildlife, including elk and domestic livestock for diseases and infections. A modernized Yukon *Animal Health Act* came into effect on January 1, 2014. It enables a comprehensive response to animal diseases in domestic animals and wildlife, and minimizes negative economic impacts of animal disease outbreaks.

Early detection of disease requires regular testing of sufficient numbers of animals, which varies depending on the prevalence of the disease or pathogen, and methods for testing. Currently, game farmed elk are tested for chronic wasting disease. Active surveillance programs in wild elk currently focus on winter ticks and chronic wasting disease.

Contact between elk and livestock represents the highest risk of introducing or spreading diseases and pathogens in elk. This may include direct contact between animals or indirect contact when elk access livestock feed. Preventing contact between elk and livestock is the best way to reduce the risk of disease and pathogen transfer. Developing a disease risk assessment as part of the regional assessment described in Goal 4, Objective 1 may be considered and would provide



additional guidance on addressing concerns about contact between elk and livestock (including captive elk). Specifics for disease and pathogen control vary with the disease or pathogen in question. Cooperative disease management, clarification of the roles and responsibilities of involved agencies or groups, and agreement over information sharing and confidentiality would be a priority.

WINTER TICKS

Winter ticks are found in low numbers on elk in both the Braeburn and Takhini herds, and have been found occasionally on other species (e.g. mule deer, moose) in southern Yukon.

Environment Yukon captured and intensively managed the Takhini and Braeburn elk herds in an effort to reduce winter tick loads. During 2008 and 2009 female elk were captured in late winter in an effort to reduce the number of winter ticks on the animals. The animals were released after the ticks had fallen off them and the calves were able to follow their mothers. The elk harvest was designed, in part, to prevent elk from spreading ticks to new areas.

Currently, winter ticks are monitored by collecting hides from elk, moose, deer and caribou throughout the territory. Hides from harvested animals, as well as hides from road killed or found dead animals, are included in this monitoring program. In 2012 Environment Yukon developed a new method to estimate tick burdens on submitted hides, and Animal Health Unit staff have been using this method to monitor distribution of ticks in Yukon, and to monitor levels of tick infestation in different ungulate species. Environment Yukon staff in the regions will be trained to use the new method so hides can be processed in the field and at regional offices. Currently, ticks on captive elk are not monitored.

CHRONIC WASTING DISEASE

Chronic wasting disease has never been detected in Yukon and the nearest reported case occurred at the Saskatchewan-Alberta border. Environment Yukon tests the brain and other tissues of harvested or found dead deer, elk, moose, and caribou for this disease. Hunters are encouraged to submit the heads of harvested ungulates by contacting a conservation officer or the Animal Health Unit. A regulation was introduced in 2013 to minimize the risk of introducing chronic wasting disease to Yukon. The regulation prohibits the import or possession in Yukon of high risk body parts (not edible meat) of members of the deer family that were killed outside of

Yukon. The regulation also bans the import, sale or possession of scent lures sold for hunting the deer family that contain animal bodily fluids or tissues.

There is currently a mandatory chronic wasting disease monitoring program for game farmed elk. Although the risk for chronic wasting disease is considered low in Yukon, the impacts of the emergence of the disease would be considerable.

Actions
Monitor captive and free-ranging elk for diseases, pathogens, and infections (e.g., winter ticks) based on knowledge of current and emerging issues.
Mitigate emerging risks to elk health when required.
Promote measures to prevent contact between free-ranging elk and both livestock (including captive elk) and agricultural land.
Be prepared to implement a disease management strategy if a disease of concern is detected in Yukon elk.

GOAL 2 Carefully manage elk habitat and range in the Takhini and Braeburn areas

Objective 1: Inform land use disposition processes and planning to conserve elk habitats in the core area, and carefully manage elk habitats in the buffer area

Managing land use impacts on habitat is an important part of elk population management. Key areas identified for elk include winter range, calving areas, and movement corridors. Elk rely on a complex mosaic of vegetation and landscape features to provide habitat necessary for food and cover. These habitats need movement corridors among them. Elk tend to congregate in important habitats, and use the same areas year after year. Range-use may shift as some elk (often bulls) make seasonal excursions to explore other suitable habitats.

Elk use exposed south facing slopes, with early successional mixed-forests where shrubs are regenerating, and grasslands as key spring foraging habitat. Green vegetation on south-facing slopes is important in spring, after the long Yukon winter. Cows use dense aspen stands and areas of willow re-growth as cover to hide their neo-natal calves during calving and up to a month after. Elk also take advantage of the brome grass along the highway right-of-ways, and are known to forage on aspen.

Winter is the most resource-limiting season for elk. Elk face energetic stresses in winter because food is limited and of poorer quality than other seasons. Recently, the winter distribution of the Takhini herd has been more variable than in previous

years. While the elk continue to use their traditional winter range and nearby aspen forests, they have also ranged further to the west, in the Mendenhall River and Cracker Creek areas, and to the east to the Takhini River Road area.

Much of the existing Braeburn Herd range was burned in 1958 with additional areas burned in 1998. The herd currently uses areas in and at the edge of the 1998 burn and it is possible that other areas of the burn will provide elk forage in the future. There are also extensive grassland slopes within the range, along the North Klondike highway between Little Fox Lake and Carmacks.

Carrying capacity generally refers to the number of individuals an area can sustain given the available habitat. Once a population reaches or exceeds its carrying capacity, resources are limited such that population size will decline. Studies have been completed to estimate carrying capacity of both the Takhini and the Braeburn herd ranges. Results showed that neither herd was at its ecologically sustainable carrying capacity and that the Braeburn herd range could sustain more elk than the Takhini herd range. This can be attributed to several factors including: the larger geographical extent of the Braeburn range, differences in habitat conditions (particularly the abundance of conifer forest, low shrubs, and wetlands), differences in the definition and quantification of browse forage between studies, the presence of a large burn in the Braeburn range (providing preferred forage), and the absence of feral horses (a competitor species) in the Braeburn range. Results of both studies reflect several underlying assumptions that must be considered when interpreting the results.

Finally, there is recognition that the Takhini Valley, which falls within the buffer zone, is identified as an important area for existing and future agriculture and residential development. Respecting the importance of this area for the Yukon agriculture industry, there is a strong interest to reduce elk-agriculture conflicts in the buffer zone and reduce the burden of responding to conflicts by farmers. As such, the parties will continue to encourage the movement of elk from the buffer zone to the core zone. There are considerable challenges to reducing the presence of elk in the buffer zone and addressing this issue will require coordinated efforts by all parties. Recommended approaches for mitigating elk-agriculture conflicts are described in detail in Goal 4.

The need to carefully manage new land dispositions in this area is an important part of elk management. Maintaining important winter range, calving areas, and movement corridors should be key considerations in the development assessment process. If new agriculture land dispositions are granted in the elk range landowners must be made aware of the potential for conflicts with elk, and should be required to mitigate conflicts with elk on their farms.

Actions
Continue to map and understand elk distribution, habitat use and selection and movement corridors throughout the core and buffer areas using science and local knowledge.
Continue to update and map wildlife key areas in the core area.
Continue to provide input on elk values and key areas to environmental assessments under the <i>Yukon Environmental and Socio-economic Assessment Act</i> (YESAA).

GOAL 3 Provide for greater human use, appreciation and understanding of elk

Objective 1: Provide elk hunting opportunities for Yukon people

Regulations were passed in 2008 to enable an elk hunt and a harvest management plan was developed with objectives for the Takhini and Braeburn herds. Harvest objectives for both herds included keeping elk away from highways, limiting the distribution of elk and winter ticks, and providing for sustainable harvest opportunities. Additional objectives for the Takhini herd included reducing the population and mitigating conflicts with agriculture.

All Yukon residents eligible to purchase a hunting licence are able to apply for an elk hunt permit for the Braeburn herd, and for a permit in the buffer area for the Takhini herd. Permits are also provided to any Yukon hunter wanting to hunt elk in the exclusion area. The elk hunt is very popular and the hunt is well communicated through news releases and the hunting regulations summary.

Between 2009 and 2014 there were 189 cow permits issued for the Takhini herd and 73 animals harvested, and 56 bull permits issued and 40 animals harvested. In the same time period, there were 27 permits issued for the Braeburn herd and 8 animals harvested. Seven of the eight elk harvested in the Braeburn herd were bulls.

In the future, a small number of permits will likely be issued for both the Takhini and Braeburn herds. Using adaptive management, the remainder of the harvest will be focused on addressing management concerns (e.g. addressing elk-agriculture conflicts). The elk harvest plan will be evaluated annually address management concerns. The harvest plan will outline the annual harvest allocations and approach and is available from Environment Yukon.

Actions
Annually determine the allowable harvest of elk based on the most recent population estimates, past harvest, population models, and the need to address current management concerns.
Use adaptive elk hunting regulations as a tool to use harvest to address other management objectives.
Provide hunters with current information about elk management issues and details of elk hide submission requirements.
Communicate the results of elk harvest to the public.

Objective 2: Increase public appreciation and understanding of elk through sharing information on the history, biology, and management of the species.

Elk are a wildlife viewing resource in Yukon. The Takhini herd provides the most accessible wild large mammal viewing opportunity in the territory. Elk are seemingly undisturbed by highway traffic and are often grazing along the roadsides. Elk are often seen on the Alaska and North Klondike highways in the summer and fall, during the tourist season. Elk rutting and harem gathering behavior make them easy to locate, view, and listen to in the fall.

Education and outreach initiatives should focus on increasing the appreciation and knowledge of elk history and biology, and furthering management goals and monitoring activities. A coordinated effort among interested agencies and groups to deliver educational opportunities should be explored. In particular, the Yukon Wildlife Preserve offers an excellent interpretive opportunity for elk. As well, some tourism operators include elk viewing in their tour packages.

For more than fifteen years, Environment Yukon has hosted an annual elk bugling and viewing event in the fall. This program is usually held in the Takhini Valley, but has also been offered in the Braeburn area. This is one of the most well-attended wildlife viewing events held, with almost 500 participants over the years. The event is advertised in printed materials, social media, and through traditional media. Elk viewing events should continue to be supported as they provide an excellent opportunity to share current information about elk management with the public.

Panels along the Fox Lake burn interpretive trail display information about how elk benefit from burned areas. New interpretive panels were recently developed for the Takhini Burn rest area on the Alaska Highway. One of these panels is focused on elk biology and management. These interpretive sites should be maintained and other opportunities for elk interpretation may be explored.

Elk are included in relevant printed and online materials including the Yukon's Wildlife Viewing Guide and the Environment Yukon website. Opportunities to share messages about elk through printed and online sources should continue to be explored.

Interest in off-highway interpretive opportunities in the Takhini Valley has been considered over the years. Some options included a short interpretive trail for highway travellers, as well as a longer backcountry route. This type of opportunity would need leadership from a community organization to proceed.

Elk harvesting and the risk of motor vehicle collisions with elk need to be carefully considered when planning elk viewing opportunities. The safety of highway travellers, elk hunters, and individuals viewing elk needs to be the highest priority.

Sharing current scientific and technical information with boards, councils, First Nations, stakeholders and the public is important. The purpose of this work is to regularly interpret and communicate study results.

Actions

Maintain existing elk interpretive sites and signs at the Takhini Burn rest area (Alaska highway) and the Fox Lake burn interpretive site (North Klondike highway).

Work with the Department of Tourism and Culture to identify opportunities to improve visitor awareness of elk viewing opportunities through Yukon's tourism market and promotional materials.

Deliver educational programs and elk viewing events, such as the elk bugling event.

Maintain current elk information in existing printed materials and on the department website.

Regularly interpret and share scientific and technical information about elk to boards and councils, First Nations, stakeholders, and the public to support management.

GOAL 4 Acknowledge and address concerns about the presence of elk on the landscape

Objective 1: Acknowledge and address concerns about conflicts between elk and agriculture

Conflicts between agriculture and elk in the Takhini Valley have increased in recent years. In the past, the Takhini herd spent most of their time in the western portion of their range. Small groups of bulls would migrate east during the winter months and individuals or small groups of elk would occasionally graze in farm fields.

During 2014/2015 groups occupied farm fields more frequently throughout the winter and, for the first time that we are aware of, did not disperse to nearby valleys in the west to calve until very late in the spring. It is unclear if this behaviour will result in habituation to farm fields in winter by these large groups or if this was a more unique event.

The presence of these elk creates challenges to farmers. The elk cause damage to fences, feed on stored hay bales, and potentially cause winter-kill on grass fields from lying down. Damaged fencing can create safety issues for livestock and horses, allowing them to escape onto nearby roads, and increase the opportunities for disease and pathogen transfer if wild elk are mixing with livestock or captive game.

Some farms are more affected than others. Specifically, farms located near or adjacent to movement corridors and irrigated and fertilized fields are particularly susceptible to attracting elk because the quality of vegetation on these farms is higher than the surrounding natural range. These conflicts cause considerable financial, physical, and mental strain for those farmers most affected.

Affected farmers have worked with conservation officers to use different hazing methods to try to deter the elk from farms. These efforts have been met with limited success. Tactics would typically work for several days and then the elk would return.

Yukon government created a compensation program in response to the ongoing conflicts. Farmers were encouraged to implement new tools and practices like improved fencing and guard dogs to adapt to the elk conflicts. The plan was to phase out the compensation program as the challenges were resolved. Compensation is helpful as it can be used to offset losses. However, compensation may also reduce incentives to find long term solutions, can become very expensive, and is difficult to stop.

There is general agreement that we need a range of options to mitigate conflicts between elk and humans. These tools include identifying farms that are most at risk to help focus resources, conditioning elk to avoid farms through hunting and hazing, and conducting farm-assessments to identify and implement actions (like barrier fencing) designed to reduce conflicts on farms. It is important that all parties involved work together to effectively implement tools. As well, there is a need to quantify damages to farms caused by elk for compensation purposes. There is also a need for a clear understanding of what compensation programs will be required to address future conflicts.

It will be important to critically evaluate and assess options used to mitigate conflicts between elk and agriculture. There is a shared responsibility for all involved to work towards finding solutions. Sustainable options include those that are cost effective, locally acceptable, and likely to improve the situation. It is also important to consider possible interactions among options and the utility of implementing

several options at once. Regular evaluations of mitigation efforts should be completed.

A regional-scale risk assessment will help predict where conflicts will occur, and will provide a bigger picture of the issue. The assessment is based on modeling how elk use their habitat and using this information to develop a regional scale perspective of areas and situations where elk-human conflicts may be more prevalent. The information may also be used to help mitigate conflicts with elk when considering new land development in the area and may provide additional guidance regarding the risk of disease transfer between wild elk and livestock. The assessment can incorporate technical information on elk movements gathered through population monitoring, as well as participatory mapping and modeling exercises with landowners.

On-farm risk assessments are used to evaluate each farm individually for the risks associated with elk-human conflicts. Completing an assessment helps producers identify what areas of their operation are at greatest risk and what are the most effective actions that can be done to decrease the risks. One tool that would likely be identified through this assessment is the use of barrier fencing. Barrier fencing is an effective tool used in other jurisdictions to help mitigate elk-human conflicts and should be considered in specific areas that are likely to present ongoing conflicts. There is reluctance among some landowners to use barrier fencing. Landowners note concerns about impeding the movement of other wildlife like moose, bears, and small groups of elk and concerns about further fragmenting the landscape. There are also concerns about deflecting the problem to other nearby farms, although this has not been the experience in other jurisdictions.

In a natural system the presence of wolves affects elk behaviour by increasing their rates of movement, displacement and vigilance. As predation within the agriculture areas is limited, this same effect can be created using hazing and hunting. Some farmers have had success using guardian dogs to deter elk from their properties.

In other areas targeted hunting has contributed to reduction of conflicts. In Yukon elk hunting has been used at a coarse spatial scale through a relatively large area with the goal of providing limited hunting opportunities, reducing population size, and limiting the spread of winter ticks. There was a fairly liberal harvest of elk in the buffer during the first years of the hunt. In more recent years the harvest has been limited to five or six permits with the objective of not allowing the population to exceed 200 animals. Increasing the number of permits and focusing the distribution of hunters in areas with high risk of conflicts and aimed at particular problem elk may have a greater potential to reduce conflicts. High risk areas identified through the regional-scale risk assessment can be used to inform harvest management. For more details on annual harvest allocations the harvest plan is available from Environment Yukon.

With a population of 200 animals, and low annual recruitment rates, a sustainable harvest only results in five or six harvest permits in the Takhini herd. Harvesting over the sustainable limit to help address conflicts will ultimately result in a population decline. To ensure the population remains healthy and self-sustaining, managers need to carefully assess and track the impact of increased hunting on the population size, and determine if the targeted harvest is helping to achieve the objective of reducing the number of conflicts between elk and farmers.

Habitat enhancement (e.g., seeding underused fields or power lines) may help mitigate elk-agriculture conflicts by attracting animals away from high conflict



areas including agriculture crops and highways. Habitat enhancement can concentrate elk, leading to potential impacts to the population and ecosystem, while possibly increasing the risk of disease and pathogen transmission among animals. If habitat enhancement is considered a risk assessment would need to be completed and long-term monitoring should occur to identify any unintended effects of feeding on the herd, the establishment of invasive species, and impacts on habitat. The costs and potential associated with habitat enhancement can be extensive and any program of this type would need to be very carefully evaluated.

Actions

Conduct on-farm risk assessments to identify effective on-farm management options and develop individual farm management plans focused on eliminating or reducing conflicts.

Use population data and habitat mapping to conduct a regional-scale risk assessment to identify and prioritize high risk human-elk conflict areas.

Quantify damage caused by elk on farms and evaluate the need for further compensation programs to offset losses. Based on this work and the existing program (Wildlife Damage Prevention & Compensation Program), the Department of Energy, Mines and Resources will lead any potential changes to the program.

Use targeted hunting and hazing to condition elk away from agricultural areas.

Assess habitat enhancement as a management tool to encourage elk persistence in identified areas of the core range. If deemed viable, develop and evaluate habitat enhancement opportunities. A risk assessment - which considers ecological implications, health risks to wild elk and other species, as well as costs - would need to be completed as part of this work.

Establish a working group to improve communication and cooperation between landowners, government and other agencies involved in elk-agriculture conflicts. The working group should periodically evaluate and assess options used to address elk-agriculture conflicts and provide advice and recommendations on management options to the Deputy Minister. The working group should aim to raise awareness and support for selected management approaches among all land owners in the area and will include representation from First Nations, renewable resources councils, and others as needed.





Objective 2: Reduce the risk of motor vehicle accidents involving elk

Elk are attracted to grasses that were seeded or that grow naturally along the Alaska and North Klondike highways. There are ongoing concerns about the risk of collisions between motor vehicles and elk along both highways. In particular the North Klondike Highway is narrow and in places shrubs have grown up close to the road making it difficult to see elk and other wildlife.

Yukon government created an interdepartmental working group with the goal of reducing wildlife-vehicle collisions. The objectives of the working group include protecting human lives and preventing injuries, contributing to healthy wildlife populations, and reducing wildlife-vehicle collisions. The working group is made up of representatives from Environment Yukon and Highways and Public Works. The working group analyzed where collisions have happened. They also developed some preliminary actions that could be taken to reduce collisions.

Most collisions take place in fall and winter (primarily October) with the return of winter road conditions, and increased darkness and reduced visibility, when elk are feeding on roadside vegetation. Between 2003 and 2014 there were 61 elk killed by motor vehicles. There were no recorded human fatalities or injuries. Collisions with elk make up 8% of all large wildlife-vehicle collisions in Yukon. This percentage is high especially considering the small population of elk.

Signs warning travellers about wildlife on highways are placed where there is a significant risk of collision. Elk warning signs are maintained on the Alaska and North Klondike highways. Moving signs to high risk areas and replacing old signs is an ongoing activity. The public is asked to report wildlife sightings along the highways to help identify potential risk areas.

There is a need to develop a more comprehensive plan to inform travellers about risk of motor-vehicle collisions with elk. This plan should include information about signage and methods for informing frequent highway travellers like truck drivers. Yukon government is investigating the potential to develop an online mapping application so the public can view accident locations. This will help travellers to account for risk areas when planning their travels.

Yukon government has been exploring ways to reduce attractiveness of roadside vegetation to wildlife for many years. The highway roadsides in elk range have not been re-vegetated since 2007. There is an interest in using seed mixtures that will not attract wildlife if these sections of the highways are re-vegetated. Another option the working group is considering is the timing and frequency of mechanical mowing of roadside vegetation.



Actions

Manage and maintain warning signs that are posted on the Alaska and North Klondike highways where elk tend to congregate.

Develop a communication plan to educate drivers and reduce the risk of motor vehicle accidents when elk are near the highways.

Investigate the use of roadside vegetation management that does not produce attractive forage for wildlife.



Objective 3: Monitor other wildlife species in elk range to provide information on status and trends

The Takhini elk herd was considered as part of a larger study completed in 2013 assessing impacts of wood bison on other ungulates. Results from the study indicated that there is moderate overlap in winter diet between elk, moose, bison, horse and deer. In the Takhini Valley, the potential for competition between species for food may be higher because animal densities and overlap between species ranges are somewhat higher, and forage availability is low. This study looked only at winter diet; no samples were taken during the summer.

It is important to continue to monitor other ungulates like caribou, moose and sheep, as well as large carnivores like bears and wolves, within elk range. It is challenging to directly attribute changes in other species due to the presence of elk but the status of those species will be tracked, resources permitting. Although competition among the ungulate species is not believed to be limiting any of them, community members still note concerns about the impacts of elk on other species and the land. In particular concerns have been raised about elk chasing other wildlife, elk moving into new areas, and the spreading of ticks from elk to other wildlife.

Action

Monitor ungulate and large carnivore populations in elk range.

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