

Eradication of Wild Boar-at-Large: Strategy Document

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Table of Contents

Table of Contents.....	2
1. Executive Summary.....	3
2. Background	4
2.1. Wild Boar: General Information.....	4
2.2. Introduction of Wild Boar to Alberta	4
2.3. Emergence of Wild Boar-at-Large as a Problematic Issue	4
2.4. Response to Wild Boar-at-Large	5
3. Strategic Options: Jurisdictional Comparison of Canadian Provinces and Northern States.....	7
3.1. Policy and Positions Overview	7
3.2. Program – Case Studies	8
3.3. Analysis of Case Studies – Lessons and Opportunities for Alberta.....	12
3.4. Internal Policy Considerations and Alignment.....	12
4. Strategy.....	13
4.1. Definition of Success	13
4.2. Key Activities of the Strategy	14
4.2.1. Education	14
4.2.2. Community Involvement and Partnerships	15
4.2.3. Surveillance and Research	16
4.2.4. Active Eradication Efforts.....	18
4.2.5. Maintenance requirements for remaining “wild boar free”	18
4.2.6. Potential Policy and/or Legislative Options	19
4.3. Challenges and Risk.....	19
4.4. Required Resources	20
4.4.1. Personnel	20
4.4.2. Estimated Budget.....	21
Appendix 1 – Wild Boar Culls By Year, 2003 – 2015	22
Appendix 2 – Number of Animals Eradicated by Municipality, 2008-2014.....	23

1. Executive Summary

Wild boar-at-large pose significant negative impacts to rural Alberta in three key areas of concern to the Ministry: economic impacts, impacts on assurance (safe food and public health), and environmental impacts. These negative impacts are experienced in both agricultural lands and natural areas. In agricultural regions wild boar can cause significant property and crop damage, harass and prey on livestock and act as reservoirs for diseases of concern that are transferable to both livestock and humans. In natural areas wild boar cause considerable ecological damage to native vegetation, cause riparian erosion and contaminate water bodies, prey on small animals and ground nesting birds and push larger wild animals out of areas due to competition and harassment.

In addition to their negative impacts wild boar populations are hard to control as they have an incredible ability to adapt to Alberta's harsh climate and thrive in a wide range of environments. They also have a very high reproductive rate and are very responsive to human pressure on their population. Current hunting control methods are problematic as they are sporadic and selective which allows the broader wild boar population to become elusive and wary complicating further control or eradication efforts. If left unchecked, wild boar populations will increase exponentially (as seen in other jurisdictions). If wild boar become entrenched, to a point where eradication is no longer a feasible response, then longer-term and expensive management options may be required. A timely and comprehensive response to wild boar-at-large populations is needed immediately.

The severity of a response can range from control, as the least resource intensive (Agriculture and Forestry's current approach), to eradication, as the most intensive. Control aims to limit the spread of wild boar into new areas and maintains a set population through active removal of individual or groups of animals. Given the negative impacts of wild boar-at-large, control is not deemed an appropriate response as any population of wild boar-at-large will cause detriment. The working group's recommendation is for a full eradication of wild boar at large.

The working group suggests a two-step approach:

- **Planning for Eradication (Step 1)** will be a low intensity initial response focused on four areas: undertaking more detailed research and surveillance to establish baseline information; generating public awareness and ownership of the issue so that the general public can act as an important partner in surveillance; setting the groundwork for more active partnerships with landowners to undertake enhanced eradication efforts; and researching and trialing a systematic eradication methodology to employ for Alberta. These activities would lead to and inform Step 2.
- **Active Eradication (Step 2)** is the direct eradication efforts and the maintenance of the wild boar free status which could also necessitate legislative changes. Direct eradication would focus on working with landowners to undertake coordinated surveillance, trapping and hunting efforts in partnership with municipal and provincial staff to effectively target populations in both natural and agricultural zones in Alberta. Active eradication will initially focus on two counties – Lac Ste Anne and Woodlands – in order to build our expertise and define and refine best practices. These two counties are also the current hotspots for wild boar-at-large in the

province. Other counties reporting wild boar-at-large issues (either by direct reports or evidenced by data from the Wild Boar Ear Bounty Program) will be targeted in subsequent years to the first two counties.

2. Background

2.1. Wild Boar: General Information

Wild boar (*Sus scrofa*) are indigenous to north-eastern Europe and Africa. They are habitat generalists that are readily adaptable to a wide range of habitat types where introduced, and can be found adapted to a wide range of habitats from the semi-arid hot southern states to the cold wet Pacific northwest to here in Alberta. They are opportunistic omnivores who primarily feed on plant material and invertebrate animals found while foraging and rooting. Where opportunity presents they also feed on small mammals, ground nesting birds, and reptiles. They live in herds (called sounders) of around 8-10 individuals usually consisting of a few adult sows and their sub-adult offspring with mature boars usually living on their own outside of breeding periods. Sows reach reproductive maturity between the age of six months and one year. They are capable of reproducing two litters per year of between four and twelve offspring. Breeding occurs in the spring and autumn, with the gestation period being just under four months. Sows prepare nests for their piglets by either digging a hole in the earth, or else lining a space in the ground with grass and leaves. Piglets are weaned at the age of 8 – 12 weeks. Wild boar are very intelligent and, where pressured by humans, show a remarkable ability to adapt their behaviour to become elusive to human eradication efforts.

2.2. Introduction of Wild Boar to Alberta

Wild boar were first introduced into Alberta in the 1970s and 80s as a diversified livestock opportunity. Their hardiness, coupled with the distinct flavour of their meat, made them an attractive species for marketing purposes. In the early days of wild boar farming in Alberta, it was not uncommon for the animals to be left to roam at large in expanses of forage land with insufficient containment. This situation resulted in wild boar escaping.

2.3. Emergence of Wild Boar-at-Large as a Problematic Issue

When wild boar were first escaping or being released from farms, the issue of wild boar at large was not considered problematic. It was widely believed that wild boar would not easily survive the wild or the winter in Alberta. However, the animals thrived in the wild, owing to their hardy, adaptable, and tenacious nature. Consequently wild boar which have escaped, or were released from captivity led to the species becoming established in several areas of the province.

2.4. Response to Wild Boar-at-Large

Legislative Response

In May of 2008 the *Agricultural Pest Act* and the *Pest and Nuisance Control Regulation* were amended to declare wild boar to be a pest when at large in Alberta. Pursuant to this legislation an owner or occupant of land or property is obligated to take active measures to prevent the establishment of pests on their land. This legislative change led to new minimum containment standards in 2014 for farmed wild boar in order to reduce escapees and prevent wild boar from becoming pests.

Written agreements were signed by nine municipalities with known wild boar producers: Parkland County, Lac Ste. Anne County, Clearwater County, Stathcona County, Woodlands County, MD of Spirit River, MD of Big Lakes, County of Stettler, and County of St. Paul. The agreements outline the roles and responsibilities of the department and the municipalities, and provides initial administration support to each municipality for five years to assist with the implementation of the containment standards. An exception to the containment standards was made available to the producers if they met the equivalency standards of staking down their existing fences by October 1, 2014. All fencing systems must conform to the containment standards by December 31, 2018.

The Inspection and Investigation Section, along with municipal staff, are working with all known producers to achieve compliance. The eventual outcome will mean that no more wild boar will be added to the “at large” population. This program is on-going and is part of Phase 1 and will run concurrently with the eradication, Phase 2 program.

Program Response

Alberta took steps to deal with the growing problem of wild boar at large by initiating The Wild Boar At Large Ear Bounty program which began as a pilot program in Lac Ste. Anne County in 2003. The purpose of the Wild Boar At Large Ear Bounty program is to provide compensation to individuals who are controlling the spread of wild boar at large populations in the Province of Alberta. The other goal of the program is to collect data of the locations where wild boar are at large are found and to understand the severity of the infestation. After running as a pilot for five years, the program was extended as a province-wide program in 2008.

Budget for this program, since 2011, has come from the Legislative Funding Stream of the Agricultural Service Board (ASB) Grant. Annually, \$10,000 is set aside to cover the costs associated with this program. The ASB Program staff of the Agriculture Grant Programs Branch (AGPB) oversee the administration of the grant program and work closely with the Inspection and Investigation Section (IIS). IIS investigates abuse of the program and has been working with municipalities and producers to implement new fencing standards (see below) for wild boar farms to prevent wild boar from escaping and becoming a pest.

This program was extended three times since 2008. The first extension was in 2010, then 2011, and most recently in 2014. In 2011, the program moved to a three year cycle to line up with the ASB Grant. ASB's that participate in this program now sign grant agreements for three years. ASBs entered into a

new grant agreement in 2014 for this program. Municipalities wishing to join this program may do so at any time during the grant cycle. ASBs are currently in a open year current grant agreement.

The following 31 municipalities have agreements with the Province to administer the Wild Boar At Large Ear Bounty program: Acadia, Barrhead, Big Lakes, Birch Hills, Brazeau, Clear Hills, Clearwater, Greenview, Lac Ste. Anne, Leduc, Minburn, Mountain View, Newell, Northern Lights, Northern Sunrise, Parkland, Peace, Red Deer, Rocky View, Saddle Hills, Smoky Lake, Smoky River, Spirit River, Stettler, Sturgeon, St. Paul, Two Hills, Vermilion River, Westlock, Wetaskiwin, and Woodlands.

Outcomes

In respect of the bounty program since wide-spread inception in 2008, a total of 904 bounties were submitted and paid out at a direct cost of \$45,200 (not inclusive of staff administration/oversight costs for the program). There are 18 municipalities participating in the ear bounty program, with submissions ranging from one set of ears up to 227. The municipalities with the largest participation were Lac Ste. Anne (227), Woodlands (217), Vermilion River (117), Two Hills (85), and Greenview (54). The remaining municipalities' returns were less than 50.

While the information submitted as part of receiving a bounty for ears is limited, the program does give an indication of the major problem areas in the province. The municipalities of Lac Ste. Anne, Woodlands, and Parkland show the most consistent presence of wild boar with three distinct clusters of reported kills. The most intensive one overlaps on the meeting of Woodlands and Lac Ste. Anne Counties, with another cluster just to the east of this one, and the other major cluster due south in Parkland County. Vermillion River and Two Hills Counties, in East-Central Alberta, also demonstrated a large amount of kills which peaked in 2009 and tailed off over the three following years.

The program has seen a reduction in participation over the years. In 2009 there were 200 submissions, followed by a few years around the 170 mark, and then tailing off to a low of 53 submitted bounties in 2014. There are a range of possible reasons for this reduction which are listed as follows:

- Lack of knowledge about the bounty program.
- Hunters are primarily interested in hunting wild boar for sport and not for the bounty. Landowners may no longer be submitting ears for bounty (this situation has been reported by municipal staff interacting with residents who have to drive a significant distance to collect a bounty and do not deem the bounty worth the time and cost of travel).
- The current wild boar at large populations are becoming more wary and difficult to hunt due to current pressure from hunters.
- The number of wild boar at large may be decreasing due to:
 - There being fewer wild boar producers active in the province and, correspondingly, fewer opportunities for escaped wild boar.
 - The remaining wild boar producers having improved their fencing standards thus preventing wild boar from escaping and re-establishing at-large populations in the near vicinity to farms.

The bounty program is not widely advertised, and data about wild boar at large locations is not released to the public due to a history of bounty hunters trespassing, damaging properties and disturbing land owners at all hours.

The current funding agreement between the Province and the participating counties/municipalities is valid until March 31, 2018. For data from the Wild Boar-at-Large Ear Bounty Program, see Appendices 1 and 2 for greater detail.

3. Strategic Options: Jurisdictional Comparison of Canadian Provinces and Northern States

In order to generate an effective strategy and course of action to eradicate wild boar in Alberta, it is important to glean potential lessons from other jurisdictions with similar climate, geography, and wild boar issues. Additionally, within Canada, it is important to place our strategy and efforts alongside those of our near neighbours (primarily Saskatchewan) so as to benefit from collective action where possible. Policies and programs from other jurisdictions within a similar climatic and geographic band (Canadian Provinces and northern US States) are detailed here, as well as specific details from a few of these.

3.1. Policy and Positions Overview

Province / State	Status	Import / Possession Allowed	Hunt Farms Permitted	Ear Tag / ID Required	Required to Report Escapes	Farm Licence / Reg. Required	Feral Populations
Alberta	Pest when at large	Yes	Yes	No*	No	No	Yes
B.C.	Schedule C ¹ wildlife when at large	Yes	No	No	No	No	Yes
Sask.	Livestock	Yes	Yes	No	No	No	Yes
Manitoba	Wildlife when at large	Yes, with permit	No	Yes	Yes	Yes	Yes
Ontario	Wildlife when at large	Yes	No	No	Yes	No	Yes
Montana	Prohibited animal	No	No	N/A	N/A	N/A	No
Washington	Prohibited animal	No	No	N/A	N/A	N/A	Yes

¹ Schedule "C" animals can be captured or killed anywhere and at any time in BC.

Oregon	Non-game, not protected	No	No	N/A	Yes	N/A	Yes
N. Dakota	Non-traditional livestock	Yes, with permit	No	Yes	Yes	Yes	Yes
Minnesota	Restricted species	Yes, with permit	No	Yes	Yes	Yes	Yes
Wisconsin	Prohibited invasive species	No	No	N/A	N/A	N/A	Yes
New York	Prohibited species	No	No	N/A	N/A	N/A	Yes
Idaho	Deleterious exotic animal	Yes, with permit	Yes	Yes	Yes	Yes	Yes

* In Alberta, there is both provincial and federal legislation that requires ear tag identification for off-farm transport of farmed wild boar.

Of all the Canadian provinces and northern States, Alberta is unique in declaring wild boar at large as “pests”. Other jurisdictions have utilized their wildlife legislation for designations that permit the killing of wild boar-at-large. This was necessary to negate any civil repercussions should ownership of wild boar at large come into question.

The legislation to control wild boar in Alberta could be considered moderate when compared to some other locations. We have wild boar containment standards, and the *Agricultural Pests Act* that places an obligation on owners or occupants to prevent the establishment of pests. Other jurisdictions have gone further by restricting the importation and possession of wild boar. Montana, for example, with no known feral populations of wild boar, has taken legal measures to ensure that, under no circumstances, can wild boar be possessed in that state.

3.2. Program – Case Studies

Alberta – Rat Control

Of key importance to establishing the success of the Rat Control program was the role of education, local buy-in and ownership of the program, and taking a long-term perspective. It took 10 years for the rat issue to get the required level of training, experience, and public education to effectively control rat outbreaks.

The rat program continues on as a permanent program due to rats coming into Alberta from other jurisdictions that have resident rat populations. Other jurisdictions have a different approach to rat control and eradication, with not all municipalities and counties undertaking action (often based on the

availability of resources). The impact of having different approaches is seen in Alberta where response rates are improved in areas near the provincial border where the corresponding jurisdiction has a rat-control program. For example, areas along the Alberta-Saskatchewan border where Saskatchewan municipalities have effective rat control programs require less pest-management intervention by Alberta's Rat Control program.

Saskatchewan – Feral Wild Boar Control Program

Saskatchewan is presently reviewing their regulatory position with respect to wild boar production farms. Presently, the status of wild boar, whether confined or at large, is "livestock". This designation allows for the importation, possession, and operation of hunt farms without a provincial licence. The "livestock" status creates civil and statutory liabilities for managing wild boar at large and that is why Saskatchewan has, so far, not considered a bounty program. Proposed new legislation would class wild boar at large as "wildlife" and permit avenues of management that are currently not available.

Although Saskatchewan may still be working on their legal designation for wild boar, they are more advanced than Alberta in active field control measures. The Ministry of Agriculture in Saskatchewan funds the Feral Wild Boar Control Program which is managed by the Saskatchewan Crop Insurance Corporation (SCIC). This program provides for the removal of wild boar after sighting reports from landowners. SCIC has contracts in place with established teams of qualified hunters and trappers (oft times supported by aerial surveillance) who have response protocols in place. SCIC coordinates these teams with the affected landowners and rural municipality to investigate sightings and take appropriate action to deal with wild boar at large. While use of this program has been limited, where used the program has been successful in removing entire population groups from complaint sites.

The University of Saskatchewan published a paper titled "Feral Wild Boar Distribution and Perceptions of Risk on the Central Canadian Prairies" in December 2013. This paper is the first peer reviewed research conducted on wild boar in Canada. The University is currently working on mapping of feral wild boar across Canada as well as telemetry collaring and monitoring of movements. Also in the works is a project to complete DNA analysis of tissue samples to determine lineages and origins of feral boar populations and stable isotope work that can reconstruct diet composition (agricultural versus natural). They are proposing to extend this project into Alberta under a data sharing agreement.

The Canadian Wildlife Health Cooperative and Western College of Veterinary Medicine conducted a study of the disease status of feral wild boar in Saskatchewan. Between 2009 and 2014, there were 81 hunter-killed wild boars tested. The study identified evidence of *Actinobacillus pleuropneumoniae* serotype 14, which is a respiratory pathogen causing pleuropneumonia in swine. The strain of this bacteria had not previously been reported in North America.

Manitoba

Manitoba Conservation published a report in 1999 titled "The Status of Wild Boar (*Sus scrofa*) At-Large in Manitoba". The recommendations in this report included changing the legal status from livestock to

restricted exotic wildlife. This recommendation was accepted and allowed for control activities pursuant to their *Wildlife Act*. The report also highlighted trials of activities including canvassing and prioritizing control areas, inspections, inter-jurisdictional liaisons, and in-field boar removal operations. Manitoba has never had a bounty on feral wild boar. They felt that having a bounty could present bad optics to the public that was already sensitive to bounty programs conducted with other species. Also, the hunting of wild boar was limited to residents only as a means to discourage the outfitting industry of wanting to conserve feral wild boar for profitability. Presently, Manitoba is relying on resident hunters to control feral wild boar numbers.

Manitoba's *Exotic Wildlife Regulation* classes wild boar as restricted exotic wildlife and greatly restricts importation or possession under a permit only. Additional aspects of the regulation stipulate that owners may not allow wild boar to escape to the wild, and are required to immediately report any wild boar that do escape. Owners must permanently identify each animal with a unique number and submit an annual record. The regulation allows the numbering of a wild boar with a nose ring. This regulation is by far the most progressive of Canadian provinces to manage the risk of escapes from wild boar farms. Producers have a very strong incentive to contain their animals and face liability or fines if they escape.

Montana

Montana is still considered wild boar free. As such, the state is concerned about potential encroachment from Alberta and Saskatchewan. They have introduced state legislation to prohibit the transport and release of wild boar. There is a small potential of wild boar spreading through the Cypress Hills (there have been a few reports of sightings in the area) from Saskatchewan and then further south towards Montana. Given this potential there may be a future requirement for a more active partnership with Montana, but, in the interim our responsibility will be to keep them informed of our activities and the whereabouts of wild boar in Alberta that will be of concern to Montana.

Oregon

Oregon estimates they have a wild boar-at-large population of roughly 2,000 – 5,000. The majority of this population is in southern Oregon having migrated in from California. Some pockets exist further north where hunters have illegally introduced populations.

Oregon law (passed in 2009) requires landowners to report sightings of wild boar within 10 days of the sighting and then to develop a removal plan with Department of Fish and Wildlife officials. Additional legislation was introduced to make it illegal to sell hunts for feral swine on public or private property. Violation of this law is punishable either as a Class A Misdemeanor (carrying a maximum of a \$6250 fine and/or one year imprisonment), or as a civil penalty of \$1000. This allows for a range of punishment depending on the context of the violation and the history of the violator. In addition, it is illegal to own feral swine on private property as the animal has been classified as a predatory animal on private land.

As part of encouraging landowners to abide by the law requiring them to report sightings within 10 days, the Department of Fish and Wildlife has created information packages to share with landowners who are hesitant to report sightings and runs a public awareness campaign to encourage public reporting of sightings. The information presented to landowners includes pictures and statistics on the type and economic impact of damages caused by wild boar.



As part of their efforts to eradicate wild boar, the Department of Fish and Wildlife undertake active eradication. They employ a range of techniques depending on the terrain they are conducting eradication activities in. A primary tool is the employment of staff to manage trapping activities in focal areas who also undertake opportunistic hunting. A tool for determining regions to focus on is the use of the “Judas pig” technique to conduct initial surveillance. This technique involves capturing a wild boar and fitting it with a radio tracking device and then releasing the animal back into the wild. They can then locate groups of wild boar and monitor the group size and growth, their behaviour, their travel patterns, and their home range. Oregon has trialed systematic eradication in a number of areas after a period of monitoring. They have had success in completely eradicating populations in some regions, but have struggled in other regions with more rugged terrain. They have used a variety of eradication methods in these systematic removals, either individually or in collaborative combinations. They are: group hunting (with or without dogs), bait and trap, and aerial support.

Following successful eradication efforts in target regions, Oregon has protocols in place to monitor eradication areas for a period of two years to ensure wild boar do not return and re-establish in these areas.

New York

New York has taken extreme measures to manage feral wild boar. In 2013, legislation was passed making it illegal to import, breed, or release Eurasian boars in New York. Additional regulation, adopted on April 23, 2014, prohibits the hunting or trapping of free-ranging Eurasian boar with the exception of law enforcement officers, farmers, and landowners who are authorized by the Department of Environmental Conservation. New York and a few other states have found that non-professional hunting activities actually hinder state organized eradication efforts. Unless entire sounders are removed at the same time, surviving members become very wary of humans, and hunting success decreases drastically. This could explain the reason for the decline in ears submitted for Alberta’s bounty hunt.

Australia

While not providing an immediately comparable situation to Alberta, their approach to surveillance is worth a mention. Australia utilizes public-sourced surveillance data to provide supplementary reporting on wild boar population densities and geographic spread. To gather this public data they have designed a cell phone app that makes reporting of sightings for a range of feral animals very user friendly.

Empowering the public to assist in surveillance is of great benefit to government, and represents a reasonably effective enhancement to other surveillance activities for a nominal financial investment.

3.3. Analysis of Case Studies – Lessons and Opportunities for Alberta

In southern jurisdictions, feral wild boar have been a management issue for several decades whereas the encroachment into Canada and the northern states has been relatively recent. The advice given by the U.S. Department of Agriculture to its northern territories is to take advantage of the small window of opportunity to actively eradicate the presence of wild boar-at-large before the problem becomes unmanageable.

In summary, we have learned from other jurisdictions that education and awareness is paramount in garnering public support for eradication. A supportive legislative frame work is also essential and should appropriately balance the rights of producers with the level of threat to the agricultural industry and environment.

A range of active eradication techniques have shown to be effective, when used professionally and in appropriate combinations, and could be applied in Alberta. Our climate and terrain, where wild boar are at large, is similar, for example, to Saskatchewan's.

Some jurisdictions have gone away from utilizing sports hunters to control feral wild boar as it has been proven ineffective and even counterproductive with state-run eradication programs.

3.4. Internal Policy Considerations and Alignment

The jurisdictional comparison provides opportunities and lessons learned that can be applied here in Alberta. Before being incorporated into Alberta's strategy their use must be consistent with Albertan policy and positions and/or changes to Alberta policy and positions must be considered.

Declaration of Wild Boar at Large as a Pest

In 2008, Alberta took steps to deal with the widespread problem of wild boar at large by declaring them as a pest under the *Agricultural Pests Act*. Under the *Pest and Nuisance Control Regulation*, they are to be eradicated. Wild boar are unique in Alberta in this manner as, while at large, they are a pest, but while in containment, where minimum containment standards are met, they are considered livestock. While wild boar remain a livestock option for producers, this strategy must align with the Minimum Containment Standards for Wild Boar Operations which was implemented in July 2014 with operations being required to be compliant by 2018. Depending on the degree to which the Minimum Containment Standards are abided by and the degree to which the standards achieve the target of containing commercial wild boar and eliminating the potential for escape, these standards will have to be reviewed for their role in aligning with eradication efforts. As is seen in many other jurisdictions, to effectually take steps to eradicate wild boar, most jurisdictions have prohibited the existence of wild boar as livestock.

Escaped, Stray, or Trespassing Animals

Typically, escaped, trespassing, or stray farmed animals are dealt with pursuant to the *Stray Animals Act* and its associated regulations. Responsibility for any damage or injury to property, animals, and people caused by a stray animal is placed upon its owner. The scope of the legislation applies to “swine” and other enumerated kinds of livestock. In the absence of any definition of the term “swine” that may include Latin names for genus, family, and species, the rules of statutory interpretation state that the one should apply the plain, ordinary meaning of the term. As such, “swine” includes both domestic pigs and wild boar.

The stray animal legislation does not work well for wild boar for two major reasons. First and foremost, it is extremely difficult, if not impossible, to place responsibility for any wild boar that either escaped or were intentionally released from confinement on any present or past wild boar producer because the animals cannot be positively identified as belonging to a particular producer or coming from a particular farm. Second, animals that were actually born and bred in the wild do not have owners. The legislation does not distinguish between the wild boar that have escaped and those that never were in containment by humans. The only possible value in the legislation with respect to wild boar is that liabilities and penalties may attach to humans. Without any regulated system of identification and permitting of farms, owners do not have any incentive to take responsibility for their animals.

4. Strategy

4.1. Definition of Success

Ultimate success for the Wild Boar at Large Eradication Strategy will see full eradication of wild boar-at-large in Alberta and a maintenance of this status via partnership with neighbouring jurisdictions and via a contingency rapid-response protocol to deal with new sightings (similar to the rat program).

This outcome will be a challenge to arrive at and, as indicated by other jurisdictions, can require a significant time commitment and flexibility in response. As such, a range of intermediary and related outcomes can help track progress and help with continual evaluation so as to generate learnings and feedback that can help reorient the strategy as needed.

These outcomes are as follows:

- Create and utilize productive partnerships with affected stakeholders. The intent being that effective eradication will require active participation by a range of local actors, in particular impacted landowners who have the most at stake and will be most put upon by various activities (access to their land, use of their time to manage equipment, etc.).
- Garner public support for eradication efforts and to promote greater citizen-based surveillance.
- Determine the best means to undertake active eradication activities in a manner that is cost-effective and that will build rather than disrupt AF relationships with impacted stakeholders; this can be a relationship promoting activity if done well.

4.2. Key Activities of the Strategy

The enhanced eradication program will focus on six key activities. These are:

1. Education
2. Community involvement and partnerships
3. Surveillance and research
4. Direct eradication efforts
5. Maintenance requirements for remaining wild boar free
6. Potential policy and/or legislative options

These focal activities should be thought of as concurrent activities where progress made collectively will allow for enhancements of individual focal areas. An example: as eradication efforts are initiated concurrently with enhanced surveillance and research, the eradication efforts can be focused on critical areas of density as surveillance information is compiled and different strategies for eradication can be methodically trialed to determine the best eradication tools to use for Albertan conditions.

4.2.1. Education

Education and community involvement needs to happen at a range of formal and informal levels so as to saturate the awareness of the stakeholders that have a role to play in eradication. A range of tools need to be utilized: from density maps (see Appendix 1) on wild boar, to conducting formal educational sessions, to sitting down at kitchen tables with landowners to have personal conversations about the wild boar issue and means of direct and tailored support for affected landowners.

In terms of target audience, education efforts will be targeted both generally and specifically to landowners. Generalized information needs to be available to the broad public as anyone travelling through the target municipalities has a potential role in supporting surveillance. More specified information should be shifted to landowners, rather than hunters, as they provide year round “feet on the ground” and have more of a vested interest in complete eradication.

Details on the proposed tools are as follows:

- Fact Sheets, posters, promotional items
 - A Fact sheet) will be developed to be distributed to the general public, land owners, and municipal staff. The fact sheet will cover aspects like: areas of density, how to report sightings and general impacts/issues/risks of wild boar populations. Messaging will present issues of importance such as: damage to crops and ecosystems; wild boar as disease reservoirs; etc.
 - Posters and promotional items will promote public reporting of sightings or conflicts with wild boar at large.
- Educational sessions
 - These need to be developed and presented in partnership with municipalities and ag-societies with these groups acting as the host with government specialists presenting “by invitation”.

- Given the number of information sessions available to landowners, attendance for a specific “wild boar issue” presentation is likely to be low. Presentation of wild boar as a problematic pest alongside other problem pests of great interest to agricultural landowners (i.e. jimsonweed) would provide landowners with greater benefit for their time spent and would likely generate better turnouts and discussion.
- For landowners – recognizing wild boar damage, partnering in surveillance and reporting activities, and training on eradication techniques.
- Classroom awareness for K-12 helps keep public awareness current and enables students (and their parents) to contribute to informed reporting and citizen surveillance. Karen Carle (Ag Education Consultant with the Ag-Industry Extension and Training Branch) will be approached to help develop curriculum appropriate information and presentations.
- Kitchen table conversations
 - These conversations, targeted with landowners from areas showing high density wild boar populations, allow for tailoring of messaging, encouragement of collective action for regions (rather than just specific property bounds) and better responsiveness to varying supports required to assist in eradication efforts.

4.2.2. Community Involvement and Partnerships

A challenge identified early on in defining this strategy, in relation to education and community involvement, is the tendency for landowners to be cautious of direct provincial government initiatives. In conducting educational activities and interacting with affected communities, partnerships with municipal staff and elected officials, as well as with local agricultural service boards, is vital. These partners are members of their local communities and are most often respected individuals and organizations in their communities. In addition they provide a wealth of local knowledge to enhance programming put together by the province.

Given that wild boar present an issue in both white and green zones in Alberta, cross-Ministry partnership with Parks and Environment, and the facilitation of rural municipal partnerships, will have to be developed to ensure a comprehensive and integrated response is planned where wild boar populations have the opportunity to readily cross between white and green zones and across municipal boundaries. Examples of where wild boar at large occur in green zones (and migrate in and out of white zone areas) include the Connor Creek and Jackpine Grazing Reserves as well as public land north of Whitecourt.

A list of key stakeholder and potential partners is as follows:

- Municipal staff, Agricultural Service Boards, Agricultural Fieldmen, AAAF, ASB Provincial Committee.
 - Facilitating educational opportunities, primary point of contact for information and resources for landowners, eventual working agreements for field surveillance and eradication activities.
- Agricultural Societies

- Educational delivery.
- Landowners – agriculture, recreational, and forestry.
 - Primary partners for surveillance and eradication activities.
- Government of Saskatchewan
 - Collaborating on policy and program development to ensure compatibility of approach.
- University of Saskatchewan
 - Research partner. This is an existing opportunity with the University of Saskatchewan having already undertaken preliminary research and in the process of undertaking more extensive research. A proposed agreement with Alberta has been tabled to provide a range of research and surveillance activities so as to create an integrated perspective on the wild boar issue between Alberta and Saskatchewan.
- University of Alberta
 - Potential research partner; possible collaboration with University of Saskatchewan.
- Western College of Veterinarian Medicine and Canadian Wildlife Health Cooperative
 - Potential collaborative opportunities in disease monitoring.
- Alberta Invasive Species Council
 - Partnership in public awareness potential as wild boar at large will be included in their invasive species list.
- Environment and Parks, Alberta Rangeland Management Associations, Wildlife Biologists and Park Biologists.
 - Partnerships with Rangeland Managers (e.g. Connor Creek Provincial Grazing Reserve) where wild boar at large are known to occur.
 - Potential protocols with biologists when wild boar distribution is noted during wildlife surveys.
- Fish and Game Association
 - Potential partnership opportunity for awareness and monitoring within the hunting community.
- Ducks Unlimited
 - Advocacy and educational efforts within their community of operation.
- Alberta Health
 - Educational support for advice to the public on how to minimize disease risks when handling wild boar carcasses or preparation for human consumption.

4.2.3. Surveillance and Research

Monitoring. Some monitoring will have to be conducted by provincial staff due to location on crown land, but active partnership with landowners should be explored so that they are given an opportunity to take active ownership and partnership in conducting surveillance. Options may be educating landowners on use of monitoring equipment, and then loaning equipment to landowners and tasking them with reporting activity and positioning cameras in areas they are observing to be of high activity. The general public also present a ready opportunity to generate surveillance data. As such, developing

an app for allowing easy reporting of sightings by the general public would be of benefit and would help in maintaining awareness.

Collaborative Partnerships. Linked to the partnership component of the previous goal, collaborative partnerships will also be required to undertake high quality surveillance and research. An opportunity currently exists to collaborate with the University of Saskatchewan on surveillance and research. This represents a significant cost saving opportunity as some of the research would otherwise have to contract out as AF does not have the facilities for this research. (They will conduct disease, DNA testing, and stable isotope analysis). Mapping and distribution work by the University of Saskatchewan is currently being conducted in Alberta. Additionally, partnering with the monitoring efforts of the University would give us access to integrated information from Saskatchewan allowing Alberta to forecast potential incursions into Alberta from Saskatchewan.

Focused Surveillance. Given initial information from wild boar bounty program, the focus of surveillance and research can be limited to a number of key municipalities clustered in three distinct geographic regions. These are as follows:

- West Central: Woodlands County (primary), Lac Ste. Anne County (primary), Barrhead County, Parklands County, Yellowhead County.
- Peace Country: M.D. of Big Lakes, M.D. of Smoky River, M.D. of Greenview (primary), Birch Hills County, Clear Hills County,
- Vermillion: primarily Vermillion County and Two Hills County.

Enhanced Surveillance. The hotspots within these geographic regions can be the starting point for conducting enhanced surveillance and establishing some baseline figures so as to be able to measure the success of the implemented strategy as it is put to action.

As part of enhancing the hunter declaration form as part of the bounty program, expanding the information gathered on the form will benefit research and surveillance. Another additional option for enhancing the bounty program would be to collect DNA samples to get information on family sizes, family lines (i.e. able to trace new outbreaks to farms if DNA samples are also taken from farms), and patterns of interbreeding between groupings/areas.

Filling Data Gaps. Other areas of research to focus on are as follows, and are intended to address some of the current information gaps requires to make informed strategic decisions for Phase 2:

- Actual diseases being carried by populations. This can help set priority for which populations to target given the risk potential to livestock or crops (contamination due to defecation). This is also important in determining the degree of risk and the corresponding intensity of response. Information from this research can also be used to get targeted buy-in from specific groups (e.g. Alberta Pork).
- Migration corridors (if they exist, or are more random). Part of this will be determining if hunting pressure demonstrates a cyclical pattern of movement out of white zones into green zone and then back after a number of years. As one of the decisions to be made is whether to allow the continuation of hunting and the sale of wild boar hunts (incentivizes maintenance of

wild boar-at-large populations). Local data demonstrating the impact of hunting will need to be presented to justify either termination of hunting or continuation of hunting.

- Preferred food sources. This can help predict movements of wild boar groups to areas of preferred food (crop rotation planning) and can assist in bait and trap activities.
- Actual fertility and reproduction rates for wild boar specific to Alberta (i.e. does Alberta's harsh winter exert a greater degree of restrictive pressure on the rate of reproduction as reported elsewhere). This information will inform the degree of urgency to which longer term action needs to be initiated and will give a greater understanding of timelines for spread of populations due to growth.
- Over-wintering habitat and movement patterns in winter. If distinct patterns are found, this can help narrow search areas in Alberta during the winter months.
- New research needs will arise as action is taken within the range of goals of this strategy.

4.2.4. Active Eradication Efforts

Bounty program. Other jurisdictions have found that bounties are not a benefit to eradication programs, other than the data they provide for locations of wild boar activity. We have collected our Alberta bounty data from 2008 and we can use that information to determine where wild boar at large activity is most concentrated. The grant program for the bounty will continue for municipalities who are not participating in the Wild boar at Large Eradication Project. The Wild Boar at Large Bounty Program will be reassessed after a review of the Wild boar at Large Eradication Project is completed to determine if the bounty program has any potential to provide benefit towards eradicating wild boar at large.

Systematic eradication methods. The recommended primary tool for systematic eradication efforts is the utilization of large scale coordinated trapping to capture entire sounders, based on mapping of populations and monitoring to ensure complete eradication in an area. Trapping will be undertaken in partnership with landowners. An option for supporting landowner efforts would be making trapping kits (i.e. panels, initial bait, and trail cameras) available for loan in a similar manner that AF makes water pumps and piping available on an emergency basis for agricultural operations. Some municipalities are already providing this service for free and only requiring a damage deposit (e.g. Lac Ste. Anne County). Provincial staff would be required to undertake trapping efforts on crown-land. Additionally, where landowner resistance is present or landowner inability to appropriately conduct trapping exercises exists, provincial or municipal staff, or contracted services, may have to run trapping programs on a cost-recovery basis.

Trapping efforts will be supported by other humanely acceptable forms of euthanization where appropriate.

4.2.5. Maintenance requirements for remaining "wild boar free"

During the process of active eradication, site monitoring of areas "freed" of wild boar will need to continue to ensure that as eradication efforts fan out from one area to another that wild boar populations do not reinvade "freed" areas. Information from the Oregon State "Feral Swine Action Plan" suggest a two year period of active onsite monitoring for wild boar presence.

Complimentarily to the monitoring of areas under active eradication will be establishing an annual contingency fund and protocol for effecting rapid-response eradication teams to respond to movements of wild boar back into or towards areas that have been cleared. A contingency fund will be able to be rolled forward (i.e. no new funding required) in years where it is not used, and topped-up in years where responses were required.

Additional aspects of maintenance will be to continually monitor the effectiveness of the containment standards introduced in July 2015 to ensure the wild boar farms are minimized as a source of wild boar-at-large. Depending on the degree of uptake on the containment standards, more rigorous enforcement may be required and additional accountability standards may be required (i.e. better tagging so as to be able to trace commercial escapees).

4.2.6. Potential Policy and/or Legislative Options

This activity will initially be limited, but, as information and feedback is generated, a range of legislative options may have to be considered. These options would be based off how other jurisdictions have utilized targeted legislation to resolve specific issues in the task of eradication that align with the level of risk presented. Policy tools to enact the required response may be as simple as revisiting standards and agreement or may escalate to the level of regulations or acts. Some areas that may require legislation and policy decisions include:

- The legality of selling wild boar hunts, either on farms or in the wild (individuals having a vested interest in maintaining the presence of wild boar-at-large to preserve their livelihoods runs counter to the need to eradicate wild boar-at-large);
- The legality of non-systematic hunting wild boar by the general public as hunting has been demonstrated to be disruptive of systematic eradication efforts;
- A legal requirement for landowners to report sightings and develop eradication plans in partnership with AF staff or municipal staff (depending on manner of developing collaborative action plan for eradication with municipalities).

4.3. Challenges and Risk

The primary challenge is the risk of insufficient preventative action to control and eradicate the wild boar-at-large population before the population experiences exponential growth. As demonstrated in other jurisdictions, wild boar-at-large populations slowly build until they surpass recreational (hunting) control methods at which stage the population enters an exponential growth rate which requires a corresponding exponential increase in management and eradication efforts to keep pace with growth. (Some US states report that a 70% annual cull rate is required to keep the population from growing; eradication only begins to take effect once culling surpasses 70% of the population).

Another major challenge experienced in other jurisdictions, which does not appear to be an issue yet in Alberta, is translocation of wild boar populations by human efforts. This has been the primary source of the spread of wild boar in the US. The reason it happens is that local hunters appreciate having wild boar as an unlicensed, year-round big-game hunt animal. In other jurisdictions, certain members of the hunting community demonstrate active resistance to eradication efforts and hinder reporting of wild

boar populations or actively populate areas close to their homes. As exposure to wild boar hunting is not as wide spread as in some southern states, this risk remains relatively small, but strategic communication still needs to be developed to get buy-in from hunters and hunting groups so that they generate positive norms and peer pressure in the hunting community about the intrusive danger and damage of wild boar and the need to be supportive of eradication efforts.

Issues with potential choices for eradication:

- Hunt bounty – examples of abuse in Alberta and other jurisdictions where non-wild pig/boar parts are collected and submitted for bounty (i.e. tail)², disruptive nature of sport hunting to whole sounder removal.
- Trapping – must be utilized with patience and expertise to ensure efficiency. Feral pigs in jurisdictions where trapping has been used inexpertly has resulted in pigs becoming wary of traps and human presence. As such, use of this means of eradication became compromised.
- Heli-hunting – expensive (approximately \$1,200 per hour plus expenses) and, because wild boar occur most frequently in Alberta in dense forest cover, the use of heli-hunting may require the concerted use of infrared sensing technology to be totally effective. The use of helicopters should not be totally ruled out as the technique has been successfully deployed here in Alberta for wolf and chronic wasting disease (cervids) projects and could be an effective and efficient means to remove complete wild boar sounders. Heli-hunting remains effective in Kansas where this means of eradication is employed infrequently as a means of geographic control to either eradicate large populations in concert with ground action or as border control to keep encroaching populations from other states within those state boundaries.

4.4. Required Resources

4.4.1. Personnel

- AF's Extension and Communications Services Division will be requested to provide extension and communication tools, assistance with media articles, website content, communications plan, brochures, fact sheets, hand-outs, presentations, and mention on Call of the Land.
- The municipalities (Agricultural Fieldmen) will be requested to host public meetings and presentations, and assist with surveys. They will also continue with the management of the ear bounty program in each of their municipalities.
- Inspection and Investigation Section inspectors will present at public meetings and other presentations, and lead survey efforts.
- The University of Saskatchewan has offered an agreement where they will share field survey data and tissue analysis (DNA and stable isotopes) collected in Alberta as part of their research.
- Other external groups will be solicited for contributions to build public awareness and engagement.

² <http://www.wildpigconference.com/proceedings09/holtfreter.pdf>; Joe Tschetter, Mixburn Hutterite Colony (AR 30473)

4.4.2. Estimated Budget

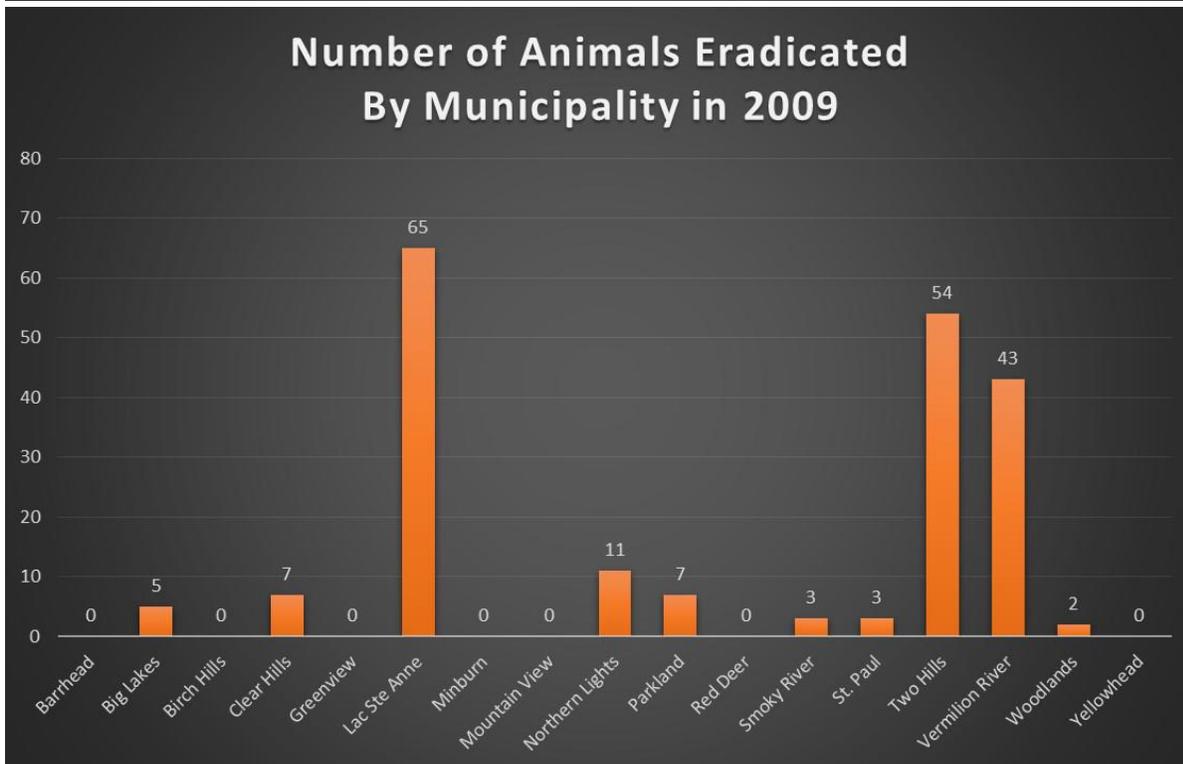
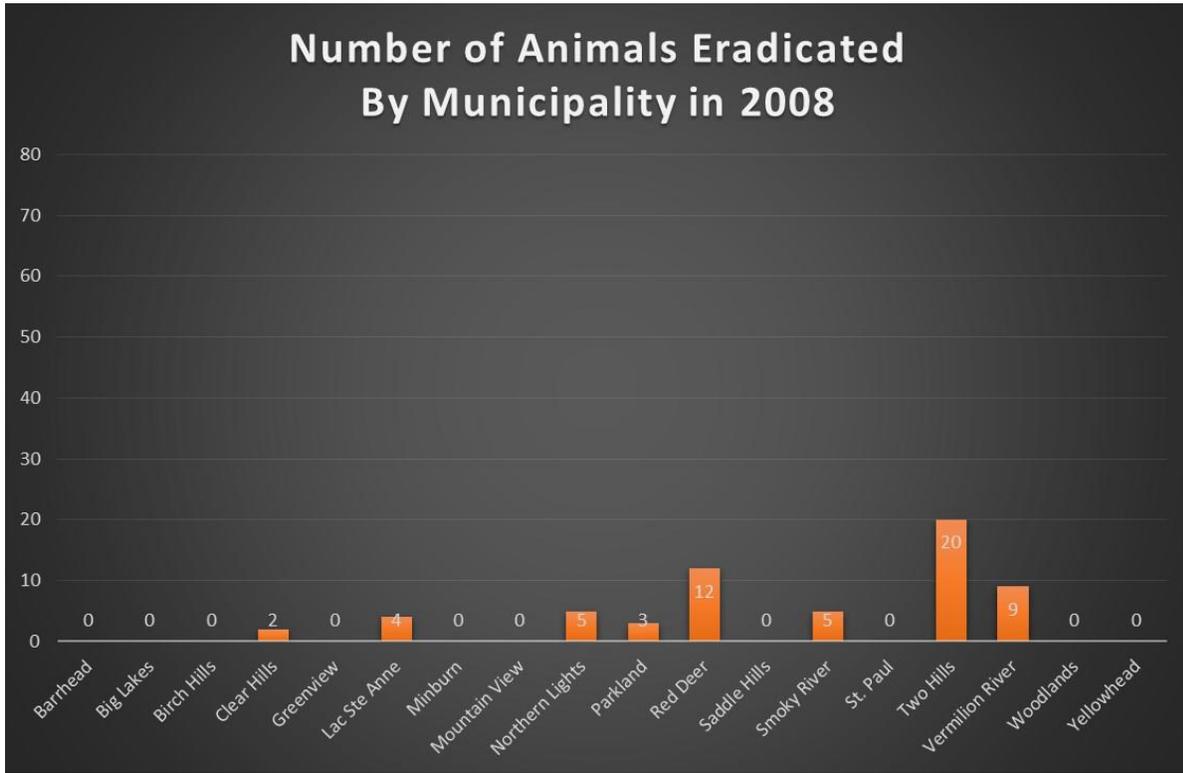
An initial budget of \$30,000 would be required to support the completion of the first three elements of this strategy (Education, Community Involvement & Partnerships, Surveillance, and Research). This will lead us to where recommendations will be presented in support of an active eradication program. A breakdown of the estimated \$30,000 preliminary budget is as follows:

- \$5,000 – meetings
- \$15,000 – travel
- \$10,000 – supplies

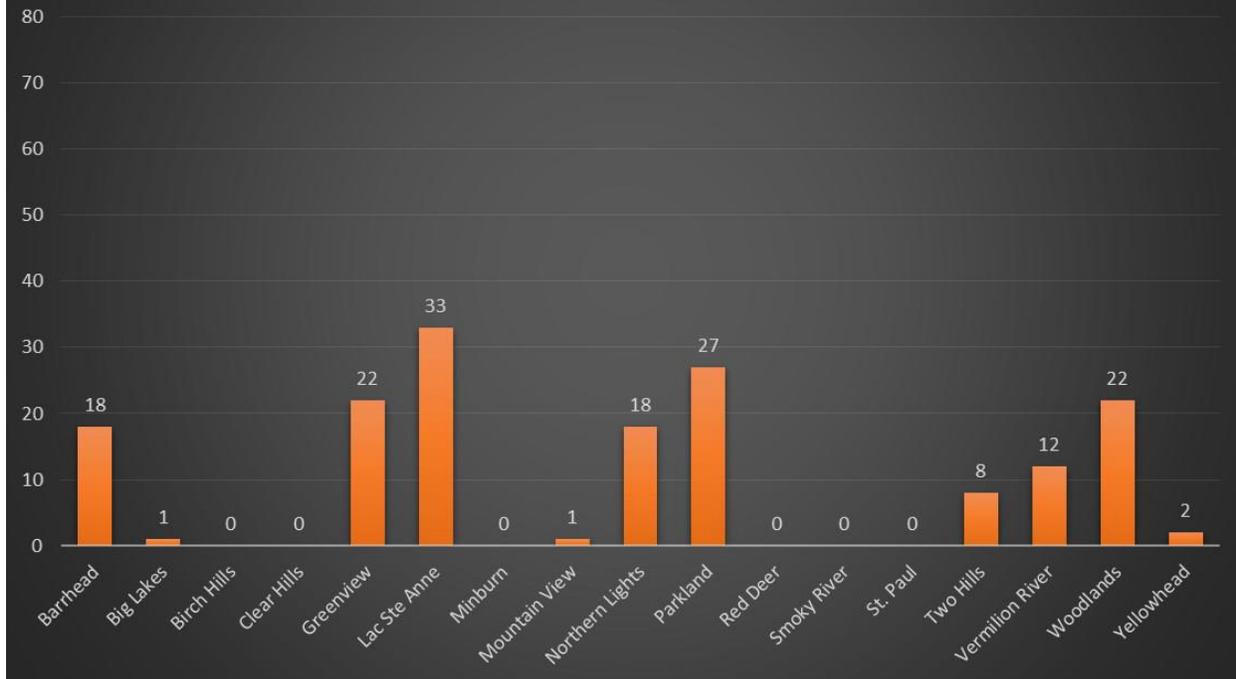
Appendix 1 – Wild Boar Culls By Year, 2003 – 2015



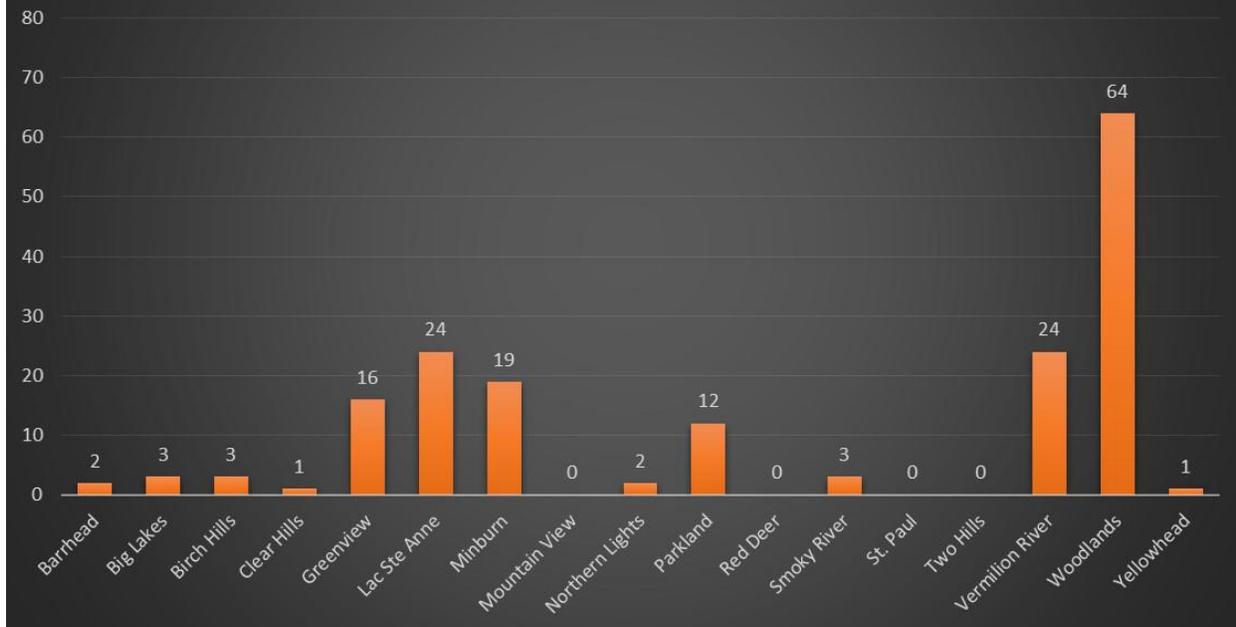
Appendix 2 – Number of Animals Eradicated by Municipality, 2008-2014



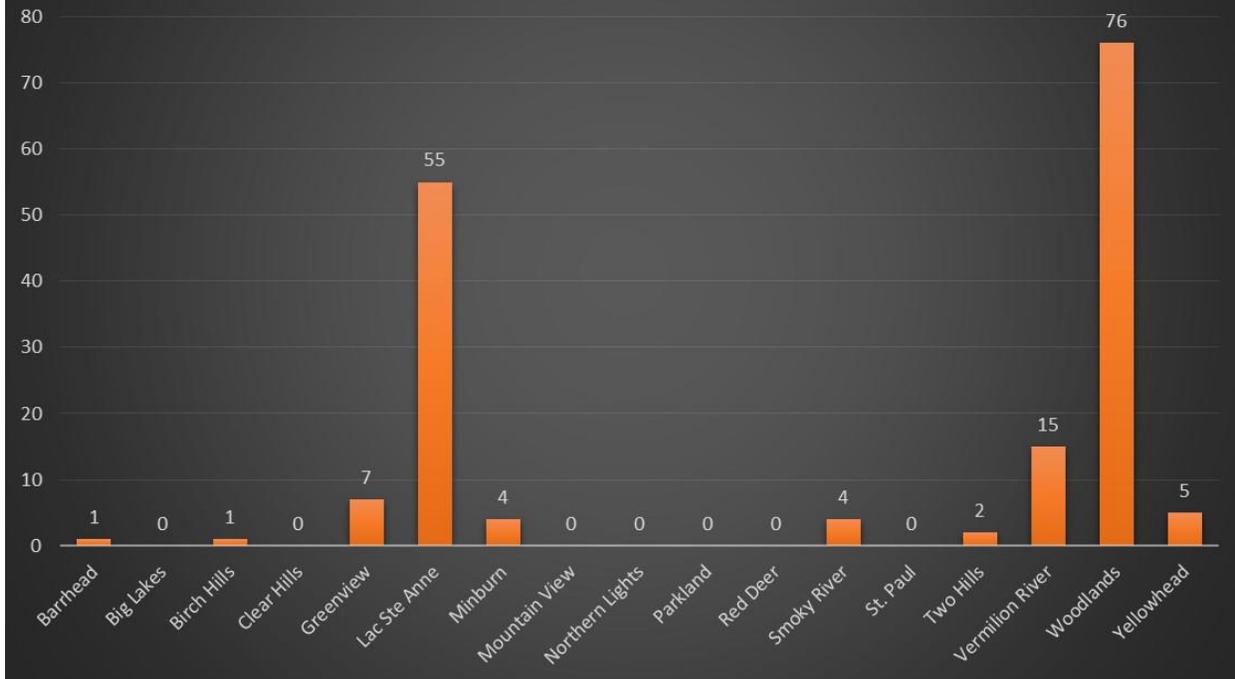
Number of Animals Eradicated By Municipality in 2010



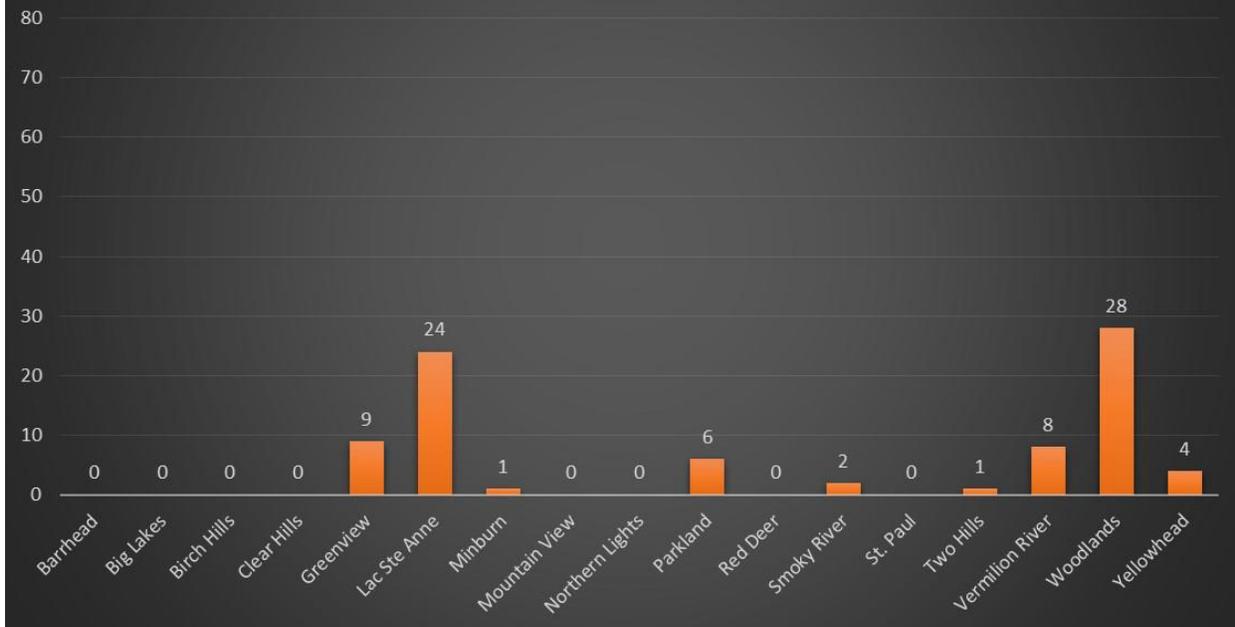
Number of Animals Eradicated By Municipality in 2011



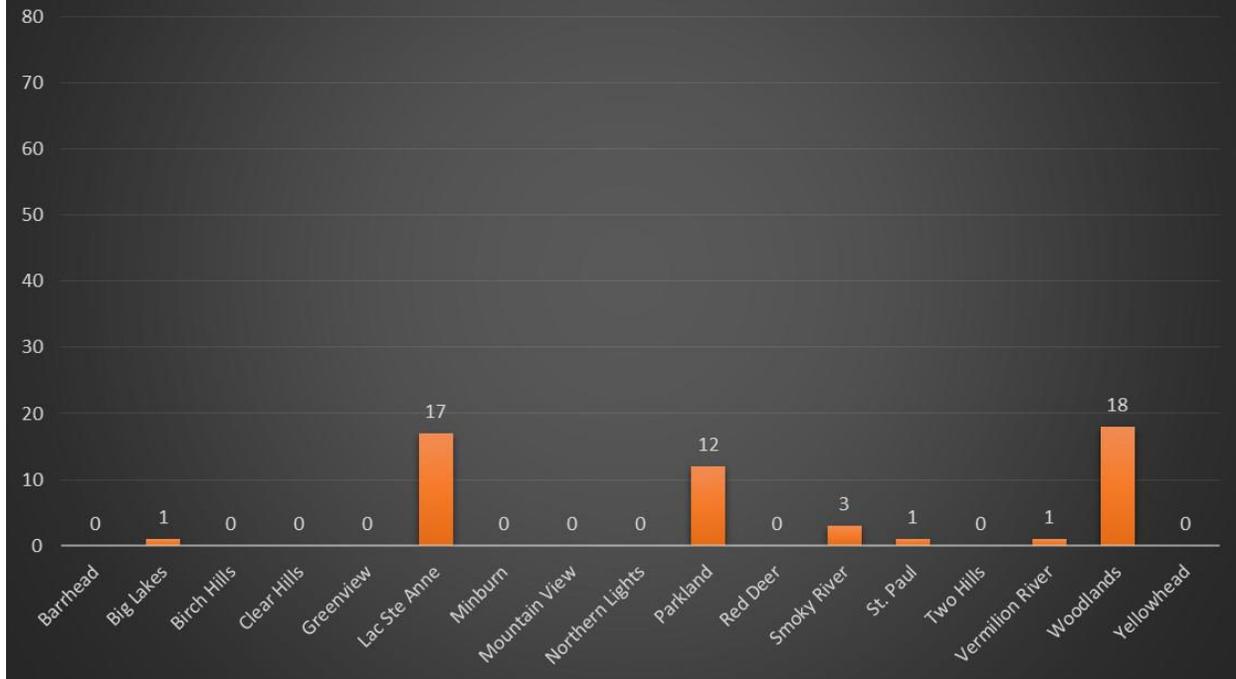
Number of Animals Eradicated By Municipality in 2012



Number of Animals Eradicated By Municipality in 2013



Number of Animals Eradicated By Municipality in 2014



Number of Animals Eradicated By Municipality from 2008-2014

