



Towns of Okotoks

Integrated Pest Management Plan

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INTRODUCTION

Integrated Pest Management (IPM) is a decision-making model used to prevent and manage pest problems. IPM promotes the use of various management practices (cultural, biological, mechanical, chemical, legal, and genetic) to prevent and manage weed and pest infestations.

In Okotoks the following practices are integral to the IPM program:

- Specifications for construction and design for new development such as adequate top soil depth, tree planting requirements, and species selection guidelines all contribute to proactive pest prevention strategies.
- Cultural maintenance practices on sports field turf such as top dressing, aerating, fertilizing are proactive pest control measures.
- On select sites, irrigation is monitored and controlled through IQ2 compatible central control for sports fields to optimize water application and conservation.
- Pruning for pest and disease control is common practice.
- Monitoring programs for invasive pests (e.g. emerald ash borer and Dutch elm disease).
- Spot spraying for invasive weeds on non-manicured sites is undertaken to meet regulatory requirements. Threshold spraying is performed on manicured sites on an as-needed basis.
- Control of prohibited noxious weeds in environmentally sensitive areas is undertaken immediately, usually initially by hand-pulling. Follow-up by chemical control may be necessary.
- Public education through communications and the horticulture hotline aim to inform residents of strategies to control pests and disease while conserving water and minimizing chemical use.

Integrated Pest Management (IPM) Practices can be used anywhere pests are present, but more importantly, before pests are even present. A good IPM Plan uses proactive strategies, like monitoring, for pest prevention and relies less on reactive measures for pest control. Although generally more costly to set up initially, IPM strategies save money in the long run.

The Town of Okotoks Integrated Pest Management (IPM) Plan provides specific information on how to prevent and manage pests on lands within The Town of Okotoks. This plan is a fundamental component of the Town's park maintenance, management, and environmental policies which incorporate effective and environmentally-sound land stewardship practices. This IPM plan fits well with Okotoks' new vision statement:

"The Town of Okotoks is resilient, where people, businesses, ideas and sense of community thrive. Grounded by the Sheep River valley and supported by thoughtful planning and design, a strong local economy and a vibrant civic

culture, Okotoks offers exceptional quality of life at every stage of life. Respect for each other and the natural environment makes Okotoks home.”

By implementing a sound IPM plan, the Town of Okotoks demonstrates the importance of the Sheep River watershed by coordinating the development and delivery of IPM strategies. The Town also encourages the sharing of information resources to protect and enhance river valley environments and adjacent agricultural lands.

The update of the IPM plan includes:

- Weeds are re-classified as noxious and prohibited noxious as per the Alberta Weed Control Act and Regulation (2010).
- Common weeds and pests are identified with the associated actions for management, if any.
- The goals of the plan have been updated and re-organized to reflect current practices.
- The strategies and actions of goals 7 and 8 of the 2008 plan have been incorporated into goals 1-4.
- Reference to associated legislation, acts, and bylaws are to the current editions.

Communication of the IPM plan update as follows:

- Report to the Culture Parks and Recreation committee (November, 2015)
- Report to Council (December, 2015)
- Resident consultation on IPM practices will be conducted through the conservation educator program beginning 2016.

OBJECTIVES

The purpose of the Town of Okotoks Integrated Pest Management Plan is to:

- provide the background and history for developing the plan
- identify the need for a plan
- relate the plan to the Town’s current policies and publications
- identify perceived issues and concerns around pest management
- gather support from existing stakeholders, committees, and Council for implementing the plan
- provide management tools and resources for implementing the plan
- create clear goals for ensuring success of the plan
- provide implementation guidelines for Administration, contractors and developers directly involved with managing vegetation and pests, planning, design, or construction of new and renovated landscapes, facilities, and public land
- provide administrative guidelines for committees of Council, boards, and staff indirectly involved with vegetation and pest management

- foster inter-municipal and regional coordination and cooperation towards IPM actions and activities (e.g., Dutch Elm Disease research, watershed stewardship activities, public weed pulls, etc.)
- provide guidelines and informational support to encourage residents and businesses to adopt and implement IPM solutions
- minimize use of herbicides and pesticides

The Town of Okotoks will manage vegetation and pests in a manner that:

- promotes safe conditions for the public and Town personnel
- minimizes risk to the environment and protects surface and ground water quality
- maintains and enhances the aesthetic beauty of the Town's natural and developed park environments
- facilitates and enhances opportunities to pursue and enjoy recreational activities in parks and open spaces
- sustains, preserves and enhances heritage features
- sustains and enhances natural and naturalized areas to provide recreational opportunities for residents and habitat for wildlife

NEED AND FRAMEWORK

The need for a plan is clearly evident during the spring and summer when weeds and pests are abundant. Pest complainants are quick to voice their issues, while others concerned with pesticide use are equally vocal. Having a plan in place will allow the Town to find a balance between acceptable pest levels and to use the appropriate treatment strategy when control is necessary.

The Integrated Pest Management Plan is intended to work in conjunction with and compliment other municipal policy documents and bylaws including:

- *Okotoks River Valley Management Plan*: current edition
- Town of Okotoks *Urban Forest Management Plan*: current edition
- Town of Okotoks Beaver Management Policy (1991) & Plan (2009)
- Town of Okotoks *General Design and Construction Specifications*: current edition
- Town of Okotoks *Municipal Development Plan*: current edition
- Town of Okotoks Land Use Bylaw: current edition
- Town of Okotoks Open Spaces and Recreation Facilities Bylaw: current edition
- Town of Okotoks Nuisance and Unsightly Premises Bylaw: current edition
- Town of Okotoks Right to Know Bylaw : (current edition)
- Okotoks Community Sustainability Plan: (to be finalized in 2016)
- Town of Okotoks Tree Bylaw: (to be adopted in 2016)

BACKGROUND

In 1996, Okotoks Town Council created an Action Committee on Plant Health Care and Pest Management – *Working Towards a Healthier Environment*. This Committee developed seven objectives aimed at controlling pesticides. In March 1997, Council endorsed the Action Committee’s seven objectives. In June 1998, Council passed the Right-to-Know Bylaw. The Town of Okotoks had incorporated IPM strategies and practices in parks management and maintenance, however, a “formal” IPM plan was never developed.

In March 2002, the municipalities of Turner Valley, Black Diamond, and Okotoks identified common watershed management issues. Pesticide use and its effects on healthy aquatic ecosystems were identified as common concerns. In 2004, the three communities received funding through Environment Canada’s EcoAction program to conduct further research into municipal pesticide issues and to develop public information and awareness programs to address residential perceptions and use of pesticides. One of the key outcomes of the preliminary research was the lack of formal IPM Plans within the three communities. If residents were being encouraged to adopt IPM practices on private lands the Towns would have to lead by example themselves.

It was proposed the three towns construct a Tri-Community IPM Plan and a draft was created in 2006. The draft was given to each town to complete it to fit their own needs.

In 2008, the first draft of the Okotoks IPM Plan was brought to Council and implemented thereafter. An update of the plan was brought to Council in late 2015.

LEGISLATION

Legislative Definitions

The Federal Pest Control Products Act defines a pest as “an animal, a plant or other organism that is injurious, noxious or troublesome, whether directly or indirectly, and an injurious, noxious or troublesome condition or organic function of an animal, a plant or other organism. The definition is also related to the situation or size of the pest population that adversely interferes with the aesthetic, health, environmental, functional, or economic goals of society. The federal definition essentially states that a pest is any organism that poses a threat to our resources, human health, and/or exists in an undesirable location.

In conjunction with the above federal legislation there is provincial legislation that provides a legal perspective to determine whether an organism is a pest. Along with its own bylaws, the Town of Okotoks has a legal responsibility to comply with various authorities and legislation.

Alberta Weed Control Act & Regulation: current edition

The Provincial Weed Control Act & Regulation contains regulations that identify various plants as weeds. These lists are by no means comprehensive, particularly in relation to introduced species that have negatively impacted our natural and naturalized areas (e.g. Russian olive, *Caragana spp.*)

The Weed Control Act categorizes weeds into two classes:

- a) noxious – weeds must be controlled
- b) prohibited noxious – weeds must be destroyed

Municipalities may upgrade a weed to a higher class, but may not downgrade a weed.

Alberta Agricultural Pest Act & Regulation: current edition

If the Minister considers that an animal, bird, insect, plant or disease is destroying or harming or is likely to destroy or harm any land, livestock or property in all or part of Alberta, the Minister may, by regulation, declare the animal, bird, insect, plant or disease to be:

- a) pests
- b) nuisances

The Wildlife Act of Alberta and Migratory Birds Convention Act of Canada: current edition

Some occasional pests fall under the guidelines of the *Alberta Wildlife Act* or the *Federal Migratory Birds Convention Act*. As part of the IPM Plan, provincial and federal wildlife authorities are consulted prior to any pest control actions dealing with these species (e.g. *Canada Geese*).

Fish & Wildlife Office

In Alberta Fish and Wildlife officers perform the following services:

- Ensure Albertans understand and follow legislation that protects fish and wildlife through education, prevention and enforcement.
- Administer programs and operations for human / wildlife conflict management.
- Provide support for public safety programs.

Alberta Environment

Alberta Environment is the provincial resource for information regarding environment and parks.

Weed and Pest Problems within the Town of Okotoks

The Town of Okotoks is located within the Chinook belt, an arid and windy region. During the winter, desiccating Chinook winds contribute to already drought-stressed plants rendering them less competitive or resistant to invasive species and pests.

Pest problems are found in various locations in the Town including decorative parks, annual and perennial display gardens, cemeteries, sport fields, roadway green spaces, operational compounds, Town owned buildings and facilities, and private property. Each site has different maintenance and pest management requirements.

The tactics used to control pests largely depends upon land classification and habitat. Within the Town of Okotoks, the main types of pests are:

- Weed pests of manicured turf and non-manicured areas and disturbed land
- Invasive/aggressive ornamental tree and shrub species in the river valley and naturalized areas (e. g. *Caragana*)
- Insect and disease pests of the urban forest
- Invertebrate flying pests (e. g. mosquitos)
- Invasive aquatic species
- Vertebrate pests of indoor and outdoor facilities

Weeds and Invasive Plants

The table below indicates the information and/or response for each type of weed.

WEED/PLANT TYPE	INFORMATION AND RESPONSE
<p>Noxious Weed</p> <p>Weed Control Act- A person shall control a noxious weed that is on land the person owns or occupies. Control means to inhibit the growth or spread or to destroy.</p> <p>The Alberta Weed Regulation lists noxious weeds and the Alberta Invasive Species council has fact sheets on the internet that describes the plants.</p>	<p><u>Action:</u> Most noxious weed complaints on private property are managed through the Town of Okotoks Nuisance and Unsightly Premises bylaw. Parks controls noxious weeds in manicured and natural areas with mechanical and chemical control.</p>
<p>Prohibited Noxious Weed</p> <p>Weed Control Act -A person shall destroy a prohibited noxious weed that is on land the person owns or occupies. .Destroy means to kill all growing parts or to render reproductive mechanisms non-viable.</p> <p>The Alberta Weed Regulation lists prohibited noxious weeds and the Alberta Invasive Species council has fact sheets on the internet that describe the plants.</p>	<p><u>Action:</u> The Alberta Weed Control Act and the Town of Okotoks Nuisance and Unsightly Premises bylaw are utilized by Parks to control prohibited noxious weeds. Parks issues weed notices for private land and destroys prohibited noxious weeds in manicured and natural areas with mechanical and chemical control.</p>
<p>cotoneaster: <i>Cotoneaster acutifolia</i></p> <p>Tatarian honeysuckle: <i>Lonicera tatarica</i></p> <p>Caragana: <i>Caragana arborescens</i></p> <p>crabapple: <i>Malus spp.</i></p> <p>green ash: <i>Fraxinus pennsylvanica</i></p> <p>Russian olive: <i>Eleagnus angustifolia</i></p>	<p>These invasive plants are not currently designated under the Alberta Weed Regulation, however pose a threat to Okotoks river valley and naturalized areas and are typically removed from those areas as resources permit. Where slope stability or erosion may be negatively impacted, removals may be undertaken over a much more gradual period of time or not occur at all.</p>

Tree Pests and Tree Diseases

The table below indicates the information and/or response for each type of tree pest and tree disease:

TREE DISEASE/PEST	INFORMATION AND RESPONSE
<p>Fire Blight: <i>Erwinia amylovora</i></p> <p>Declared a pest under the Alberta Pest Control regulation.</p>	<p>Bacteria that affects plants in the <i>Rosaceae</i> family. (crabapple, apple, pear, hawthorn, rose, cotoneaster) Severe infections can kill a tree in one season. Symptoms include sudden wilting and die back of twigs and leaves. Both appear as they have been scorched by fire and may form a shepherd's hook shape.</p> <p><u>Action:</u> Infections on public trees are pruned out as resources permit. The town also has a phase out strategy in place. When susceptible trees species are killed by this disease they replaced with alternate species that are not affected by this bacteria.</p>
<p>Dutch Elm Disease: (DED) <i>Ophiostoma ulmi</i></p> <p>Native elm bark beetle: <i>Hylurgopinus</i> <i>Rufipes</i></p> <p>European elm bark beetle: <i>Scolytus multistriatus</i></p> <p>Declared pests under the Alberta Pest Control regulation.</p>	<p>Both the native elm bark beetle and the European elm bark beetle can transmit the fungus that causes Dutch elm disease. This disease can kill an elm tree within one season. Alberta is Dutch elm disease free at this time.</p> <p><u>Action:</u> There is Provincial elm pruning ban in effect between April 1 and September 30 so that pruning may be accomplished while beetles are inactive. Elm firewood cannot be stored as this provides habitats for beetles. If an elm tree is suspected of having Dutch elm disease contact the DED hotline at 1-877-837-3567. A confirmed DED tree must be removed and disposed of immediately.</p>
<p>Emerald ash borer (EAB): <i>Agilus planipennis</i></p>	<p>EAB is an alien invasive species from Asia that can kill any species of ash (<i>Fraxinus spp.</i>) in North America within a few years of being infected. It is not declared a pest under the Alberta Pest Control regulation but it is anticipated that it will because Manitoba and Saskatchewan have recently added this pest to their provincial pest control regulations. It is not currently in Alberta but showed up in Winnipeg, Manitoba in 2017 and is now a quarantined area under the Canadian Food Inspection</p>

	<p>Agency (CFIA). This is considered the most westerly location in Canada.</p> <p>Action: Monitor for EAB insects using sticky traps and lure from June – September. Submit any suspect samples to CFIA. Do branch sampling when pruning ash trees. Obtain an inventory of ash on Town owned lands and increase species diversity through planting programs.</p>
<p>Other pest and disease: Black knot: <i>Apiosporina morbosa</i> Cytospora canker: <i>Leucostoma kunzei</i> Hypoxylon canker: <i>Hypoxylon mammatum</i> Birch leaf miner: <i>Fenusa pusilla</i> European elm scale: <i>Eriococcus spuria</i></p>	<p>These tree disease and pests are also common in the Town of Okotoks. They are not declared pests or nuisances under the Alberta Pest Control Act and regulation.</p> <p><u>Action:</u> These tree pests and disease are dealt with as resources permit on public lands. Private trees that are affected with either a pest or disease cannot be treated by the town.</p>

Nuisances, Pests, and Animals

The table below indicates the information and/or response for each type of nuisance, pest, or animal.

SPECIES	INFORMATION AND RESPONSE
<p>Mosquitos</p> <p>Various species of the family Culicidae.</p>	<p><u>Action:</u> Mosquitos are controlled in surface waters on public lands where mosquito larvae are abundant using a biological control agent, <i>Baccillus thuringiensis</i>, a natural bacterium safe for aquatic ecosystems. Flying mosquitos are not treated.</p>
<p>Stinging Wasps</p> <p><i>Vespula spp.</i> <i>Dolichovespula spp.</i></p>	<p><u>Action:</u> The nests of stinging wasps are treated by chemical means and removed from public lands on a case by case basis. Flying stinging wasps are not treated.</p>

<p>Meadow Vole</p> <p><i>Microtus pennsylvanicus</i></p> <p>Classified as a nuisance under the Pest and Nuisance Control Regulation</p>	<p>Voles are small mouse-sized rodents with a shorter tail. Voles are outdoor year-round residents in Okotoks. They do not become a pest indoors, but rather will chew away at lawns and trees, especially in winter. Most lawn damage is cosmetic and quickly repairs itself once grass is actively growing, by about mid-May. You may reduce damage from voles in the fall by adding tree guards, mowing grass short, and setting out bait stations. In the spring catch voles with mouse traps baited with peanut butter or apple slices.</p> <p><u>Action:</u> The Town does not control voles on public lands.</p>
<p>Northern Pocket Gopher (NPG)</p> <p><i>Thomomys talpoides</i></p> <p>Classified as a nuisance under the Pest and Nuisance Control Regulation</p>	<p>Formally referred to as northern pocket gophers (NPG's) make mounds of soil across the landscape in spring and fall. Although considered beneficial in natural environments for decompacting and aerating the soil, some consider them a nuisance. To remove NPG's on private property; you can trap them yourself or hire a private pest control company.</p> <p><u>Action:</u> Parks controls Northern Pocket Gophers on public lands on a case by case basis.</p>

<p>Richardson Ground Squirrel</p> <p><i>Spermophilus richardsonii</i></p> <p>Classified as a nuisance under the Pest and Nuisance Control Regulation</p>	<p>More formally called Richardson's ground squirrel; gophers are a burrowing rodent commonly associated with agricultural lands. To control gophers on your property, contact a private pest control company.</p> <p><u>Action:</u> Parks undertakes a proactive Richardson Ground Squirrel control program for manicured sites.</p>
<p>Eastern Grey Squirrel</p> <p><i>Sciurus carolinensis</i></p>	<p>Typically black or grey, Eastern Grey Squirrels are an introduced species and are not to be confused with the native Red Squirrel. Eastern Grey Squirrels are not currently classified as a nuisance, but may be controlled.</p> <p><u>Action:</u> Residents may control Eastern Grey Squirrels on private property. Parks does not control Eastern Grey Squirrels on public lands.</p>
<p>Domestic rabbit</p> <p><i>Oryctolagus cuniculus</i></p>	<p>Although not classified as a nuisance, the domestic rabbit has potential to become an invasive species in the Okotoks area.</p> <p><u>Action:</u> Domestic rabbits found on public lands will be controlled.</p>
<p>Norway Rat</p> <p><i>Rattus spp.</i></p> <p>Classified as a pest under the Pest and Nuisance Control Regulation</p>	<p>There have been no confirmed cases of Norway rats in Okotoks to date. Rats are often confused with muskrats or other rodents. Rats have pink feet and pink tails, while muskrats have black feet and tails. Muskrats often wander far from water and are common in Okotoks.</p> <p><u>Action:</u> Contact Parks for an inspection of dead or detained animals. Positive identification of Norway Rats will be reported to the Provincial authority.</p>
<p>Beaver</p> <p><i>Castor canadensis</i></p>	<p>Beaver activity and dams may damage facilities and trees predominantly in the river valley, storm water management ponds, or other surface waters.</p> <p><u>Action:</u> Beavers will be monitored and controlled in Environmental Management Zones as outlined in the Town of Okotoks Beaver Management Policy, Okotoks Beaver</p>

	Management Plan and the River Valley Management Plan.
Skunk <i>Mephitis mephitis</i> Nuisance under the pest and nuisance control regulation	Skunks are omnivores, eating both insects and plants and can be quite opportunistic, getting into pet food, garbage, and compost. In an urban environment skunks find food and shelter on private property most frequently. To deter skunks on your property, ensure holes under decks and outbuildings are blocked. To have skunks trapped on private property, contact a pest control company. Permits and regulations may apply. <u>Action:</u> Where skunk dens are located on public lands, Parks may undertake control on a case by case basis.
Fox <i>Vulpes vulpes</i>	Foxes mainly consume small rodents, birds, eggs and rabbits. To deter foxes on your property, ensure holes under decks and outbuildings are blocked. To have foxes trapped on private property, contact a pest control company. Permits and regulations may apply. <u>Action:</u> Where fox dens are located on public lands, Parks may undertake control on a case by case basis.
Deer Mule Deer: <i>Odocoileus hemionus</i> White-tailed deer: <i>Odocoileus virginianus</i>	In 2015 a citizen survey on deer was undertaken and a deer count was conducted. There is a public education strategy in place to reduce human-deer conflict, deter feeding of deer, and promote deer resistant landscaping <u>Action:</u> Human-deer conflict should be reported to the Fish and Wildlife authority. They will determine if further action is required. Human-deer conflict may be reported to Parks to have warning signage placed in the area of concern. To report illegal feeding of deer, contact Municipal Enforcement.
Cougar <i>Felis concolor</i>	Typically in Okotoks a few cougar sightings are reported each year. <u>Action:</u> Cougar sightings should be taken seriously and reported to the Fish and Wildlife Authority. They will determine if further action is

	required. Report cougar sightings to Parks to have warning signage placed in the area.
<p>Coyote</p> <p><i>Canis latrans</i></p> <p>Classified as a nuisance under the Pest and Nuisance Control Regulation</p>	<p>Coyotes are common to this region and although their diets are mainly rodents and rabbits, they may attack pets.</p> <p><u>Action:</u> Only close encounters or incidents of aggressive coyote behaviour should be reported to the Fish and Wildlife authority. They will determine if further action is required. Report aggressive coyote to the Parks business unit as well to have warning signage placed in the area of concern.</p>
<p>Moose</p> <p><i>Alces alces</i></p>	<p>Moose are wild animals and need to be given space and privacy. Stay safe by keeping an appropriate distance from them or just avoid the area.</p> <p><u>Action:</u> Report moose in Town limits to Fish & Wildlife. They will determine if further action is required. Report to Parks to have warning signage placed in the area of concern.</p>
<p>Bear</p> <p>Black Bear: <i>Ursus americanus</i></p> <p>Grizzly Bear: <i>Ursus arctos</i></p>	<p>Okotoks is a wildlife corridor and bears may pass through the Sheep River Valley.</p> <p><u>Action:</u> Bear sightings should be taken seriously and reported to the Fish and Wildlife authority. They will determine if further action is required. Report bear sightings to Parks to have warning signage placed in the area of concern.</p>
Non-native fish	<u>Action:</u> Parks will consult with appropriate regulatory bodies.
<p>Dog</p> <p><i>Canis lupus familiaris</i></p>	<u>Refer to:</u> Town of Okotoks Responsible Pet Ownership Bylaw: current edition
<p>House Cat</p> <p><i>Felis catus</i></p>	There is no bylaw regulating cats in Okotoks. Feral cats on public lands will be taken to local animal shelter or pound facility.
Other	<u>Action:</u> Parks will consult with appropriate regulatory bodies.

Causes of Pest Problems

In the Town of Okotoks the major causes of pests are:

- a. **Readily available sources of infestation:** include contaminated nursery stock, transported firewood, unsanitized equipment, vehicle tires, railway cars, contaminated seed sources (wildflower seed mixes and wild bird seed), and contaminated hay.
- b. **Environmental conditions:** loss of habitat, decrease in soil quality (compaction, road salts), insufficient watering, weather, site disturbance from construction, landslides, and flood events.
- c. **Mechanical damage:** the operation of maintenance equipment can damage turf or injure adjacent trees. Mechanical damage can lead to infestation by pests and disease. Vertebrates (e. g. deer, rabbits, gophers, and voles) can cause significant mechanical damage to trees and turf.
- d. **Inadequate landscape construction:** pest species can easily take up residence in areas that are not landscaped appropriately (such as insufficient topsoil), planted with inappropriate plant materials, or not controlled such as through a weed management plan. The impact of inadequate construction on weed and pest management is not often noticed until well after the project is completed and signed off.
- e. **Lack of maintenance:** whether on public or private lands, a lack of maintenance invites invasive species to take up residence and propagate and disperse quickly. Seeds, spores, eggs or other sources of pest infestation impacts pest problems in adjacent areas.
- f. **Intentional or unintentional release of pets into the environment:** e.g. cats, dogs, rabbits, birds, fish, reptiles, amphibians, etc.

CURRENT CHALLENGES

The Town must consider a range of challenges and issues when implementing vegetation and pest management in landscape and park environments, including:

- **Health, Safety, and Water Quality**
- **Aesthetics versus Need**
- **Education and Notification**
- **Administrative and Political**
- **Construction and Disturbed Sites**

Health, Safety, and Water Quality

***Issue:** The Town should ban all pesticide use because of the potential for impact on human health and environment.*

Response: Noxious and prohibited noxious weeds and various insect pests are invasive species that cause significant threat to our agricultural crops, urban forest, the environment and its associated ecosystems. Many of these invasive species are required to be controlled or destroyed by law. Integrated pest management promotes utilizing the best strategy and practices to address a specific pest problem, which includes using pesticides when necessary. Banning pesticides would reduce the number of management tools available allowing some of these invasive species to spread beyond control by other methods. Minimal concentrations of chemical can be effective when used properly and at the right time during the growing season. Pesticides are applied by Alberta certified pesticide applicators.

***Issue:** There are concerns that the products presently used by the Town represent long term and potentially dangerous hazards to individuals using public lands.*

Response: Herbicides are a very useful tool for weed control and are especially helpful on sites where weed infestations are severe. There is extensive scientific evidence that herbicides are very safe when applied as intended following instructions for use. As severe weed infestations can be extremely detrimental to the environment and agriculture industry, finding the right balance between chemical use and acceptable weed levels is instrumental. The Town's "Right to Know" bylaw warns users of the area intended for treatment. Herbicides will only be applied when noxious and/or prohibited noxious weeds are present, or when nuisance weeds exceed the threshold levels.

The Pest Management Regulatory Agency of Health Canada is the governing body that approves and grants registration for pesticides in Canada. Prior to receiving Federal registration, the manufacturers are required to demonstrate the products do not pose a significant health risk, as long as they are used in the manner for which they were registered. The Town only uses pest control products that have received Federal registration.

Of far greater concern is the frequency and improper application of pesticides by residents who are not trained in proper pesticide application procedures and are not aware of potential harmful human health and environmental impacts. Of particular concern is the application of herbicides prior to storm events which may not provide enough time for the product to break down and become chemically inert. As a result, pesticide products enter the Sheep River and can have adverse effects on aquatic health.

Issue: *Children that use tot lots and playgrounds and sports fields cannot comprehend pesticide warning signs and as a result are likely targets for secondary herbicide exposure.*

Response: Town maintained tot lots and playgrounds are not to be treated with pesticides. The maintenance practice will be to hand-pull or till weeds from gravel areas. The IPM Plan recommends a 15 meter “pesticide-free” buffer zone be maintained around playgrounds and tot lots. Sports fields will be closed for maintenance should a herbicide application be necessary. Signage will be posted as per the “Right-to-Know” bylaw.

Aesthetics versus Need

Issue: *There may be a perception the Town may indiscriminately use pesticides.*

Response: The frequency of pesticide application on Town land depends on turf health, vigor and quality, location, and maintenance standards and type of park or public land. The maintenance standard for different public lands determines the efforts needed to maintain that site. The Town does not indiscriminately use pesticides. Indiscriminate use of pesticides contradicts the provincial Environmental Codes of Good Practice for pesticide applications and is subject to prosecution by the provincial government.

Issue: *There is a perception that nuisance weeds such as dandelions are not invasive and do not pose a threat to municipal public lands.*

Response: Nuisance weeds are generally opportunistic and symptomatic of growing conditions not adequate to support desirable species. Unhealthy turf and exposed soil areas are susceptible to weeds. Many of the turf grass mixes used are better suited to irrigated sites. Periods of drought can send turf species into dormancy, allowing weeds to flourish with little competition. Weed infested lands are not only unsightly, but can lead to uneven ground (ie. trip hazards), erosion, and decreased land value. Cultural maintenance practices such as top dressing, aerating, fertilizing, and necessary irrigation are required to keep traditional turf resilient from weed infestation. Chemical applications of herbicide may occur when weeds exceed threshold levels. Where appropriate, especially on non-irrigated sites, native and non-traditional turf mixes should be considered to provide healthy ground cover resistant to weeds.

Issue: *The lists of pests are not all inclusive in the provincial regulations and civic bylaws.*

Response: The IPM Plan will continue ongoing efforts towards determining pest categories and tolerance levels of various pests within the Town. Initial pest management objectives within the plan will be based on the legal pest definitions in the Agricultural Pest Act and Weed Control Act. Further review of these pest species will be determined in future IPM program reviews and in consultation with professional expertise of the Provincial Weed Inspector.

Education and Notification

Issue: *There are few formal educational opportunities which would enable communities to understand the methods and principles needed to participate in pest management of civic or private landscapes.*

Response: Different levels of cooperation and participation from residents will result from apparent contradictory messages received from various sources internal and external to the community. The IPM Plan will continue to assist in establishing consistent messages and delivery of IPM information and educational programs on the Town's IPM Plan and how homeowners can utilize IPM principles and practices on their properties.

Issue: *The concern is that the present notification system does not adequately address all potentially susceptible open spaces and parks users.*

Response: The IPM Plan provides public notice on pesticide applications. Community areas and residents receive a 24 hour pre-notification of herbicide applications and 48 hour post-notification through warning signs posted at the main entrances to residential areas and directly at the site where applications will occur. Timing of chemical applications is not to conflict with sports field bookings and special events.

Issue: *How is staff trained in IPM?*

Response: Most staff involved in implementing the program bring with them post-secondary training including IPM and cultural management practices. Additional education is provided as needed to Town staff, committees, and Council to help in decision-making about IPM strategies and implementation plans. The IPM Plan recommends establishing regional cooperation and continued participation in external educational training programs for Town employees, developers, and private contractors involved with various aspects of pest management.

Administrative and Political

Issue: *Why do we need an IPM plan if we're already practicing IPM strategies?*

Response: Although there was no formal departmental IPM program in place until 2008, the Town utilized different management strategies within their operational units that were fundamentally IPM based. However, there is a need to ensure that there is education, awareness and support for implementing IPM practices.

Issue: *Periodically the Town has received interest from individuals/groups that have expressed interest in the Town or specific public lands to be "pesticide-free."*

Response: The IPM Plan establishes a framework to encourage and facilitate community involvement in park maintenance. Although some noxious and prohibited noxious weeds may require chemical application for control, other weeds can be managed through alternate IPM practices, but may not be able to remain within threshold levels. Requests for specific areas to be "herbicide-free" will be considered on a case-by-case basis and may require additional resident consultation.

Issue: *Information regarding pest management is not consistent or coordinated with the Towns in the region. The Towns need to become leaders in environmentally sound pest management to assist in the preservation and protection of urban and rural landscapes as well as the overall aquatic health of the Sheep River watershed.*

Response: The IPM Plan establishes a framework to develop and encourage other Towns in our watershed implement this or a similar IPM program. The IPM Plan also encourages public education campaigns and educational materials to inform residents of current and alternative pest management practices.

Transportation, Construction, and Disturbed Sites

Issue: *The railway and school bus routes provide mechanisms for weeds to be introduced and transported out of the community, creating a potential impact on rural lands. The school bus parking areas have frequent scentless chamomile infestations and the railway line also transports weed seeds.*

Response: The active railway line through the Town of Okotoks provides a mechanism for weeds to be transported into and out of the community. Similarly, school buses have also had the potential to transport weed seeds. The Town works together with transportation organizations to manage weed issues within the Town of Okotoks borders. It is recommended that these areas are regularly inspected and actions are taken to remove weed infestations to avoid impact on rural landscapes.

Issue: *Increased development within the Town has increased disturbed soil areas susceptible to weed infestation as well as introduced soils and potential weed seeds. These areas become unsightly and contribute to the noxious and prohibited noxious weed problem on both urban and rural landscapes. The large quantities of new trees and other plant materials used in new communities also pose a risk to introduce pests and disease. Regular inspections of new plantings on municipal lands are essential to maintaining pest free urban environments and supporting IPM strategies.*

Response: Okotoks' General Design & Construction Specifications are updated regularly to accommodate this goal. Site inspections and orders to control weed growth should be conducted and issued on a regular basis. In minimizing risks of pests, the Town will support and encourage nursery suppliers join forces with the Domestic Phytosanitary Certification Program (DPCP). This is a program developed by the Canadian nursery industry and supported by the CFIA (Canadian Food Inspection Agency) promoting clean nursery stock.

GOALS OF THE IPM PLAN

In order for the Integrated Pest Management (IPM) Plan to be successful, residents, Administration, Committees, and Council need to have a clear understanding of the management goals and guidelines involved. In addition, when the plan is implemented as it is intended, it must contribute to controlling pest populations to the desired level.

Goal 1: Appointed IPM Coordinators lead and implement the plan

Due to the technical requirements of the Plan and its implementation, coordinators must have related education and experience in IPM. As IPM measures vary significantly between turf and urban forest, appointing coordinators for each area with the appropriate expertise is necessary. IPM coordinators will carry out the Plan and be accountable for its goals and objectives.

Some Specific Strategies and Actions...

- Appointed IPM Coordinator(s) assess and manage the turf and urban forest IPM programs.
- IPM Coordinator(s) will determine both short- and long-term strategies for reducing weeds and pests.

Goal 2: Maintain turf maintenance standards

Without assessments and a plan, managing weeds and pests is a very reactive process often involving many site inspections and more pesticide solutions than what may have been necessary. Without acceptable threshold guidelines for pests in place, discrepancies between aesthetics and need for control are common. In a reactive process, areas with frequent complaints tend to use/receive more resources for pest management than other areas, contributing to worsening problems in neglected areas.

Maintenance Standards

Maintenance standards determine the intensity and type of management applied to sites and features. Insects, disease, and vertebrate pests usually require a case by case assessment and evaluation to determine acceptable levels and treatment practices. Acceptable levels of weeds in turf have been established.

Park maintenance classifications are obtained from the Town of Okotoks Parks Management Park Maintenance Classifications: current edition. Examples of acceptable weed levels are found in the Outdoor Facilities Master Plan: current edition for Sports Fields and the Great Plains Turf grass Manual: current edition for high and medium profile areas.

Taking these references into account, the following acceptable threshold levels for weeds form the basis for weed management in the Town of Okotoks. When the Town receives interest from individuals/groups to not have pesticides/herbicides used on specific public lands, resident consultation may be required. Where resident consultation is deemed necessary (as determined by the Town), 75% support for the service change is required.

Class	Short Description	Long Description	Threshold Levels of Weeds
A	Parks	High profile parks and boulevards	5%
M	Commercial Sites	Town owned and operated building sites not associated with designated parks	5%
B	Parks	Irrigated parks & playing fields	15%
C	Parks	Non-irrigated parks or playing fields, may also include high profile boulevards and medians	15%
S	School Grounds	The Town may contribute to IPM measures on lands included in the Joint Use Agreements.	15%
P		These are Town-owned areas where regular maintenance is carried out by the adjacent landowner	15%
W	Connector Walkways	Treated the same as Class C parks, but can be upgraded if they are adjacent to a higher classified park	15%
R	Roadsides	Roadsides, boulevards and medians and some steep slopes	Control noxious and prohibited noxious
N1	Natural Areas	River banks, gullies, escarpments, islands, wetlands	Control noxious and prohibited noxious
N2	Protected Natural Areas	Generally the same as N1, but minimal intervention and only to protect the area from fire and to reduce immediate hazards	Control noxious and prohibited noxious
I	Industrial Areas	Town owned parking lots and storage compounds	15%

U	Undeveloped	These are lands which may come under Town ownership.	15%	
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Some Specific Strategies and Actions...
○ Determine and propose cultural management practices to improve turf health.
○ Turf that is identified as having weed issues to be assessed for weed threshold levels prior to herbicide application
○ Coordinate chemical applications around sports field bookings and special events.
○ Investigate and trial new species/varieties of groundcovers requiring little to no irrigation.
○ Utilize appropriate resources to control weeds and pests in natural areas with minimal disturbances to native species.
○ Require staff, private contractors and developers directly involved with managing vegetation and pests operate in accordance with this IPM plan and with all government acts and regulations.

Goal 3: Develop and implement urban forest pest and disease assessment and control measures
Pests and disease in the urban forest may be less visible to the public eye, but protecting the urban forest asset from this damage is a key component in urban forest risk management. As trees have a long lifespan and add significant environmental, aesthetic, and financial value to a community, protecting these assets is of utmost importance.

Some Specific Strategies and Actions...
○ Assess and diagnose insect infestations spring, early summer, and late summer on host species. Determine appropriate management guideline(s) for the short- and long term.
○ Prune at least 1/5 of disease-infested public urban forest each year as resources permit
○ Keep informed of new pests and diseases and their appropriate management strategies by attending appropriate seminars and workshops.
○ Limit planting of highly susceptible tree/shrub species on public lands, and development permit applications sites, and encourage residents do the same.
○ Investigate and trial new species/varieties of trees and shrubs to improve biodiversity
○ The Town of Okotoks will give preference to suppliers of certified clean nursery stock through the Domestic Phytosanitary Certification Program.
○ Require staff, private contractors and developers directly involved with managing vegetation and pests operate in accordance with this IPM plan and with all government acts and regulations.

Goal 4: Improve plant health care

Healthy plants are shown to be more resistant to certain pests and disease. Improving plant health care is necessary to preventing many pest problems. In Okotoks, drought is the usually the biggest stressor to trees and turf. As water conservation is very important, improving plant health without adequate irrigation can be challenging. Appropriate site preparation and plant selection are the most important factors in preventing drought stress. Specific strategies and actions can be undertaken to meet this goal.

Some Specific Strategies and Actions...

- Identify most costly weeds and pest(s) and worst affected sites. Determine strategies to minimize/mitigate these sites in the future.
- In new development, where appropriate, select more drought tolerant plant species that require little to no irrigation to thrive and resist weeds.
- Review General Design & Construction Specifications regularly, incorporating industry best management practices and make appropriate updates to meet IPM goals.
- The Town of Okotoks will give preference to pesticide applicators accredited in Plant Health Care practices as granted by Landscape Alberta Nursery Trades Association (LANTA)

Goal 5: Control Weeds/Pests on Private Property

Weeds and pests on private property contribute to unsightly premises, weed and pest distribution, and public complaints. Most weed issues on private property are addressed through the Nuisance and Unsightly Premises Bylaw. Where this bylaw isn't relevant, weed and pest complaints are inspected and assessed and the appropriate communication undertaken with property owners and tenants to educate them. Noxious and prohibited noxious weeds are often unintentionally cultivated and propagated in private gardens. In most cases, public education is sufficient to have the property owner remove/control the species. In other circumstances, the property owner or tenant does not take action to mitigate the problem unless the law is used.

Some Specific Strategies and Actions...

- For first time offenders, send friendly educational information to property owners and tenants allowing or encouraging provincially designated weeds or pests to grow, live, or visit their property.
- For reoffending property owners and tenants, utilize the power of the Weed Control Act and Agricultural Pests Act and municipal bylaws to control or remove weeds and pests from private property.
- Ensure two municipally appointed weed inspectors and pest inspectors are on staff to carry out inspections and prepare notices.

Goal 6: Promote Public Education & Involvement in IPM Strategies

The amount of land, turf, and trees on private property is significant. A successful IPM Plan needs appropriate strategies to be undertaken on a widespread scale. Educating the public about IPM strategies is important in improving weed and pest management on private property while reducing the need for pesticides. In addition, the public can assist in reporting and controlling weeds/pests on public property in many cases.

Some Specific Strategies and Actions...

- Ensure the “Right to Know” Bylaw is followed for all pesticide applications.
- Educate the public of common weed and pest problems through the Town Pages in local newspaper and through the Horticulture Extension Resource Office.
- The Town of Okotoks will engage residents on their views of Integrated Pest Management strategies and issues.

LIST OF REFERENCES AND TOWN PUBLICATIONS

References

1. McKernan, Dennis. 1997. *Great Plains Turfgrass Manual 3rd edition*, p. 161.Z

Town Publications

1. *Okotoks River Valley Management Plan*: current editon
2. Town of Okotoks, *Urban Forest Management Plan*: current edition
3. Town of Okotoks, *General Design and Construction Specifications*: current edition
4. Town of Okotoks, *Municipal Development Plan*: current edition
5. Town of Okotoks, *Land Use Planning Bylaw*: current edition
6. Town of Okotoks, *Outdoor Facilities Master Plan*: current edition
7. *Town of Okotoks Open Spaces Master Plan*: current edition Community Development Consultants Inc
8. Town of Okotoks, *Parks Classifications*: current edition
9. Town of Okotoks, *Right to Know Bylaw*: current edition
10. Town of Okotoks, *Open Spaces and Recreation Facilities Bylaw*: current edition
11. Town of Okotoks, *Nuisance and Unsightly Premises Bylaw*: current edition
12. Town of Okotoks, *Tree Bylaw*: (to be adopted in 2016)
13. Okotoks Community Sustainability Plan: (to be finalized in 2016)

Governing Legislation

1. Federal Pest Control Products Act, current edition, Queen's Printer
2. Alberta Weed Control Act & Regulation, current edition, Alberta Queen's Printer

3. Alberta Agricultural Pests Act & Regulation, current edition, Alberta Queen's Printer
4. Wildlife Act of Alberta, current edition, Alberta Queen's Printer
5. Migratory Birds Convention Act of Canada, Queen's Act