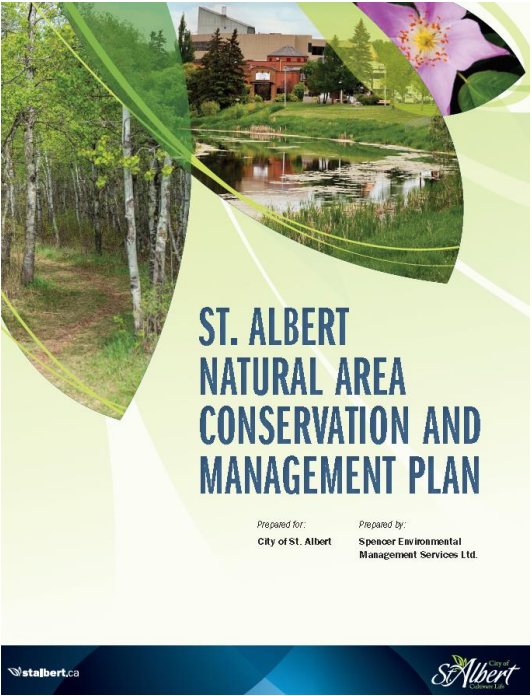
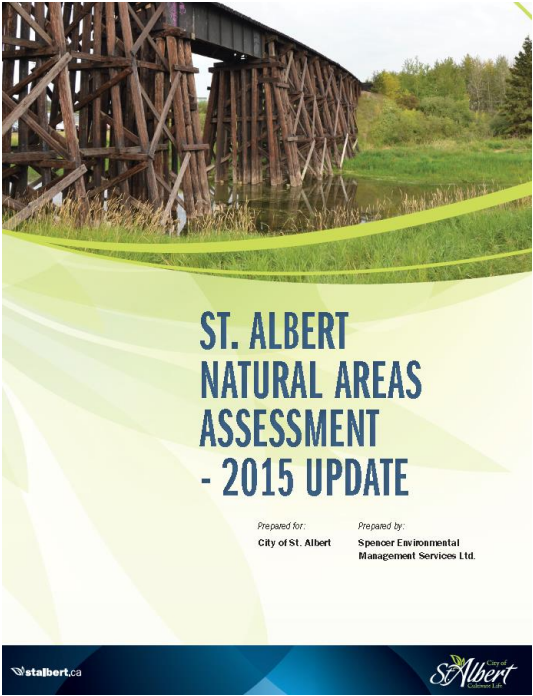


NATURAL AREAS ASSESSMENT, CONSERVATION AND MANAGEMENT REPORTS 2016

RECOMMENDATIONS SUMMARY



A. Natural Areas Conservation Recommendations

“preserve and manage trees, parks and natural areas, and a commitment to maintaining a healthy natural environment and ensuring its sustainability for future generations.”

RECOMMENDATION	IN PROGRESS	PARTNERSHIP INITIATIVE	BEST MANAGEMENT PRACTICE	CONSIDER DURING UPDATE OF MDP OR ENG STANDARDS	FURTHER RESEARCH OR CONSULTATION
1. ENVIRONMENTAL RESERVE (ER) AND ER EASEMENT A very few sizeable, unprotected wetlands remain in St. Albert. To conserve sustainable wetlands, the City will explore implementing the following approaches:					
As soon as parcels supporting wetlands become the focus of development interest, even prior to submission of ASPs, initiate discussion with developers regarding potential for wetland dedication as ER . That discussion could include establishing a buffer having a width that is sufficient to provide for effective flood control, public access and pollution prevention, that is greater than 6 m and tailored to the landscape setting.		<i>Working with Sturgeon River Watershed Alliance, Alberta Environment and Parks and Strathcona County on Municipal Wetlands Conservation process.</i>			<i>Further research and/or consultation may be required.</i>
For all wetlands greater than 0.5 ha in area, require the developer to undertake a water balance study to determine wetland sustainability in a developed context and inform suggested future scenarios.			<i>City of Edmonton and Strathcona County already have these standards in place.</i>	<i>Consider during next update of Municipal Development Plan.</i>	
Encourage the integration of natural wetlands with stormwater management facilities (SWMFs). The conservation and integration of natural wetlands into the urban landscape remains a challenge for many			<i>City of Edmonton and Strathcona County already have these standards in place.</i>	<i>Consider during next update of Engineering Standards.</i>	

municipalities in central and southern Alberta; however, integration into the storm system provides some advantages worth exploring. Integrated wetlands would become ER or a Public Utility Lot, as appropriate.					
Discourage the use of ER easement for wetlands that will be embedded in a developed matrix, as ownership of the wetland and buffer must ultimately transfer to the City.		<i>Working with Sturgeon River Watershed Alliance, Alberta Environment and Parks and Strathcona County on Municipal Wetlands Conservation process.</i>			<i>Further research and/or consultation may be required.</i>
Encourage developers to investigate the use of ER Easement for ephemeral Carrot Creek tributary drainages that are unlikely to be claimed by the Crown. Such easements would require the drainage feature to remain on future developed properties. Ephemeral drainages that exhibit wetland vegetation and are classified as a wetland are subject to the Alberta Wetland Policy and associated protocols (see section on the Water Act). The need to seek approval from the Province may strengthen the case to conserve a drainage through an ER easement.		<i>Working with Sturgeon River Watershed Alliance, Alberta Environment and Parks and Strathcona County on Municipal Wetlands Conservation process.</i>			<i>Further research and/or consultation may be required.</i>

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2. MUNICIPAL RESERVE (MR) The City will continue to use MR as a means of securing natural areas. To strengthen this tool, the following steps will be considered:					
Modify the natural area protection policy such that conventional parks are no longer explicitly prioritized over natural areas conservation. This approach is supported by the MDP policy to “require, wherever possible, that sustainable natural areas be integrated into the design of new development areas to form part of linked and integrated parks and open space systems, including the retention of natural corridors and ponding areas”.				<i>Consider during next update of Municipal Development Plan.</i>	
Consider setting a goal of a specified proportion of future MR as natural area.					<i>Further research and/or consultation may be required.</i> <i>May be affected by proposal of new Conservation Reserve in MGA.</i>

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3. CARROT CREEK GREENWAY AND FLOOD LINE DEVELOPMENT RESTRICTION Recognizing the limitations of the Carrot Creek Greenway and flood line development restriction, the City will evaluate strengthening these two existing protection mechanisms by considering the incorporation of the following conditions into planning decision-making:					
Where a stormwater pond is approved within or straddling the boundary of the Carrot Creek Greenway, or below or straddling the designated flood line, the stormwater pond will be located, designed and constructed in a manner that does not adversely affect natural area resources including clearing of natural vegetation.	<i>Already indicated that stormwater ponds along Carrot Creek will minimize impacts to natural areas within ASP.</i>				
Where a stormwater pond is approved with or straddling the 50m Carrot Creek top of bank setback, or below or straddling the designated flood line, the facility will be landscaped in such a way that provides self-sustaining naturalized habitat that is complementary to the adjacent natural area.	<i>Aligns with landscaping standards within the Engineering Standards.</i>				
Prohibit locating stormwater ponds on poorly drained, flood prone soils (i.e., Haight soil units).				<i>Experience has shown that SWMFs constructed in these types of soils tend to have significant engineering issues and often lead to a larger area of disturbance and natural area loss.</i>	<i>Further research and/or consultation may be required.</i>

Where a road or other allowable development is approved within the Carrot Creek Greenway or below the designated flood line, the process of locating that allowable development will follow a sensitivity hierarchy: locate outside of natural areas; locate on disturbed natural areas; if natural areas are disturbed, ensure an equal area of non-natural land is naturalized; ensure all structures crossing the creek or situated on a creek bank provide adequately for wildlife movement of animals as large as moose. Considerations include the quality of substrate and provision of security cover.				<i>Have a clearer hierarchy for development within designated floodplain and Carrot Creek Greenway that limits natural area disturbance where possible.</i>	
Continue to work cooperatively with Sturgeon County to promote a Carrot Creek Greenway that effectively straddles the creek.	<i>Working with Sturgeon County through Sturgeon River Watershed Alliance other planning initiatives to work collaboratively on development around Carrot Creek.</i>			<i>Consider during next update of MDP or Inter-Municipal Development Plan.</i>	

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4. SUPPORTING TECHNICAL STUDY REQUIREMENTS The City will evaluate strengthening their information requirements for natural area assessments, as follows:					
Natural Areas, including mapped natural area shelterbelts, will be assumed to be sustainable, with the burden of proof being on the proponent to demonstrate otherwise , when removal is proposed. Since the protected natural areas inventory includes numerous sites measuring less than one hectare in size, small size will not alone be considered proof that a site is unsustainable in a developed context.			<i>Other municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	
The City will not accept supporting biological fieldwork that is undertaken at seasonally inappropriate times.				<i>City should have the option of requesting further natural areas assessment / field work if necessary.</i>	<i>Further research and/or consultation may be required.</i>
The City will require a rare-plant survey for all proposed developments with the potential to impact natural habitats.			<i>Other municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	
Assessments will be required to include an analysis of the role of the subject natural areas in local and regional connectivity.			<i>Other capital region municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	
ASPs will be required to include recent aerial photographs of existing natural areas. Proposed future land use must be underlain by the most recent available aerial			<i>Other municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	

photograph and must clearly identify which proposed development features would encroach on natural areas.					
The City will make available to proponents' resource information it may possess about subject natural areas.	<i>Have already allowed use of new natural areas resource information internally and provided sections to consultants for their use.</i>				

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5. NATURAL AREA PURCHASE OR LAND TRANSFER The City will renew efforts to establish a Natural Area or Conservation Fund. (Note: This is already a policy within the MDP)					
As part of this, the City will examine internally identifying priority purchase sites , having regard for site type, site location, the role of the site in regional connectivity and potential as a future neighbourhood amenity. This process could have the added benefit of providing natural areas for neighbourhoods more distant from Red Willow Park .	<i>To renew efforts internally and work with regional partners to protect/purchase significant natural areas.</i>	<i>Aligns with work being done by SRWA on the Watershed Natural Areas Inventory, Connectivity and Conservation Project.</i> <i>May want to work with Edmonton and Area Land Trust to facilitate natural area protection.</i>			

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6. CONSERVATION EASEMENTS AND DONATIONS The City will consider investigating opportunities for conservation easements and land donations within, and immediately adjacent to City boundaries.					
<p>Opportunities for the application of these conservation tools are expected to be strongest within and adjacent to the floodplain of Big Lake, the Sturgeon River and Carrot Creek, where a conservation easement or land donation could strengthen the protection of lands subject to other mechanisms (e.g., designated floodplain restriction) by applying additional development restrictions or protecting entire land parcels, including lands beyond the jurisdiction of existing protection mechanisms.</p> <p>These voluntary protection mechanisms could, however, just as easily apply to natural areas removed from local floodplains, should a landowner be interested. The City will evaluate all opportunities as they arise. Following investigations, and as warranted, the City will encourage land donations and conservation easements as a conservation tool by communicating our long-term conservation goals with residents and conservation oriented landowners within and beyond the City's boundaries.</p>	<i>To renew efforts internally and work with regional partners to protect/donate significant natural areas.</i>	<i>Aligns with work being done by SRWA on the Watershed Natural Areas Inventory, Connectivity and Conservation Project.</i> <i>May want to work with Edmonton and Area Land Trust to facilitate natural area protection.</i>			

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7. WORKING WITH OTHERS The City will continue to work collaboratively on conservation initiatives and will consider taking the following steps, intended to strengthen both relationships and success:					
Continue to develop relationships with personnel in approvals branches of AEP, with the objective to increase information sharing and allow for City input into wetland removal application decisions. If, in future, the number of wetland natural areas increases, consider adopting a municipal wetland policy that mirrors the Albert Wetland Policy, to facilitate provincial cooperation.		<i>Working with Sturgeon River Watershed Alliance, Alberta Environment and Parks and Strathcona County on Municipal Wetlands Conservation process.</i>			
Continue to develop relationships with Public Lands personnel at AEP, with the objective of increasing information sharing and setting common goals for Crown wetlands and Crown lands along Carrot Creek.		<i>Working with Sturgeon River Watershed Alliance, Alberta Environment and Parks and Strathcona County on Municipal Wetlands Conservation process.</i>			
Continue to work with Sturgeon County to achieve an inter-municipal Carrot Creek Greenway, to harmonize decision-making around conservation of upland natural areas that straddle the City/ County boundary and to enable Carrot Creek restoration initiatives. Encourage the County to consider the regional ecological network in its planning activities.	<i>Working with Sturgeon County through Sturgeon River Watershed Alliance other planning initiatives to work collaboratively on development around Carrot Creek.</i>			<i>Consider during next update of MDP or Inter-municipal Development Plan.</i>	

Following resolution of each planning effort, hold St. Albert multi-departmental lessons learned sessions to increase the chance of efficient and successful conservation with the next application.			<i>Have discussed with Planning to have regular meetings of key internal stakeholders to review ASPs, DPs proactively and have a debrief after major projects would fit well with this recommendation.</i>		
Continue to work with non-governmental organizations with respect to land acquisition and stewardship. Investigate participating in the Edmonton and Area Land Trust (EALT), to benefit from their regional perspective and recent experience on these matters.		<i>Work with other municipalities and SRWA to facilitate communications with landowners and development community.</i>			
Continue to work with other local municipalities .	<i>Continue work with City of Edmonton, Strathcona County, Sturgeon County, Parkland County and SRWA.</i>				
Continue to work cooperatively with landowners and the development community in the application of the natural area conservation tools outlined in this document		<i>Work with other municipalities and SRWA to facilitate communications with landowners and development community.</i>			

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8. ECOLOGICAL NETWORK PLANNING FRAMEWORK The City will pursue ways to strengthen their ecological approach to planning and endeavour to use the identified ecological network as a basis for long-term conservation planning and management. In addition, the following specific steps will be considered:					
The City will identify priority retention natural areas . This will involve use of all information at hand, including information and maps provided by the 2015 study. One factor to be given heavy weight is a site's contribution to ecological network function.	<i>To renew efforts internally and work with regional partners to identify priority retention areas.</i>	<i>Aligns with work being done by SRWA on the Watershed Natural Areas Inventory, Connectivity and Conservation Project.</i>			
The City will develop conservation action priorities using the strategies and tools outlined in this plan.	<i>To renew efforts internally and work with regional partners to identify priority retention areas.</i>	<i>Aligns with work being done by SRWA on the Watershed Natural Areas Inventory, Connectivity and Conservation Project.</i>	<i>Other capital region municipalities already request this.</i>		
The City will encourage use of the ecological network framework by all parties throughout the planning process.	<i>To renew efforts internally and work with regional partners to identify priority retention areas.</i>	<i>Aligns with work being done by SRWA on the Watershed Natural Areas Inventory, Connectivity and Conservation Project.</i>	<i>Other capital region municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	
As a leader in this, the City will assist developers with ecological planning by developing reference ecological connectivity maps, using developed or planned			<i>Other capital region municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	

neighbourhoods, that illustrate important principles such as neighbourhood level connectivity, ecological function within the network, and successful integration of small, tableland natural areas into more conventional City parks. Such materials would be useful in discussions with developers.					
The City will require proponents to prepare pre- and post-development ecological connectivity mapping as part of natural area assessments and ASP submissions.			<i>Other capital region municipalities already request this.</i>	<i>Update technical requirements required for ASP submissions.</i>	

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9. NATURAL AREA LAND USE DISTRICT The City will consider the benefits of creating a new natural area land use district to be applied in advance of or as part of the development process.					
<p>While land use districts are typically established during the planning process, it is possible to revise land use districts in advance of development. Thus, application of a natural area land use district could be applied ahead of imminent development pressure to achieve conservation ends.</p> <p>Although feasible, such a process would be potentially difficult for the City without the consent of all affected landowners.</p>					<i>Further research and/or consultation may be required.</i> <i>May be replaced by proposal of new Conservation Reserve in MGA.</i>

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<p>10. INTEGRATING RETAINED NATURAL AREAS</p> <p>Using the ecological network and identified priority conservation sites as described in the section on Ecological Network Planning Framework, the City will consider creating new standards specific to locating and configuring infrastructure adjacent to natural areas so as to maximize ecological sustainability and connectivity of conserved natural areas.</p> <p>For example: In keeping with the Standards in place for trails, the City will consider developing standards for other infrastructure, such as outfalls, within natural areas, prioritizing minimal, low-impact infrastructure that minimizes natural area fragmentation. The following standards could be applied to trails, stormwater outfalls and other small-scale recreational or stormwater infrastructure development:</p>					
<ul style="list-style-type: none"> • Locate small infrastructure in open areas instead of areas supporting native trees and shrubs. • Where impacts to native vegetation are unavoidable, consider the abundance of the various habitat types in the general vicinity and locate development within the habitat of greatest abundance (i.e., avoid impacts to rare and uncommon habitat types). Avoid more sensitive habitats subject to flooding such as wetlands and areas of riparian meadow. • Ensure infrastructure development does not impede ecological connectivity or wildlife movement. • Where built structures or residential lots must be located immediately adjacent to a retained natural area, the City will consider requiring an open space buffer around the natural area that is at least 3 m wide (wider if warranted by ecological sensitivity or access requirements) to: protect vegetation from physical damage; reduce the risk 			<i>Other capital region municipalities already have this.</i>	Consider during next update of Engineering Standards.	

that natural areas pose to infrastructure and public safety (e.g., from hazard trees or flooding); reduce management action required by the City to ameliorate these risks; reduce unauthorized encroachment into natural areas; and provide space for maintenance and emergency access.					
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11. PROTECTION OF NATURAL AREAS DURING CONSTRUCTION To ensure that all retained natural areas are protected from damage during construction, the City will consider requiring development proponents to ensure that contractors prepare an ECO Plan for construction activity planned for within 50 m of a retained natural area. If implemented, the following ECO Plan requirements could be established:					
<ul style="list-style-type: none"> • Submission of ECO Plans to the City for final acceptance. • Use of one of several existing ECO Plan standards sanctioned by the City. • Content to be consistent with St. Albert's Municipal Engineering Standards. • Attachment of all required environmental permits and approvals. • Involvement of environmental specialists (e.g., Certified Professional in Erosion and Sedimentation Control) as warranted. • Preparation of ECO Plans for all redevelopment projects situated within 50 m of a protected natural area. • Preparation of ECO Plans for all construction works to be undertaken within a natural area. 			<i>Other capital region municipalities already request this.</i>	<i>The City has been requesting ECO plans for capital projects but need to make it a standard for new developments.</i>	

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12. ECOLOGICAL RESTORATION The City will continue to engage in ecological restoration initiatives and will look for opportunities beyond the Sturgeon River valley. Considering the types of natural areas in our City, appropriate ecological restoration objectives could include enhancing the health of degraded areas of riparian habitats, improving ecological connectivity between natural areas and improving habitat quality within natural areas. In most cases, restoration activities will adopt one of two approaches: 1) establishing native plant communities; and/or 2) enhancing physical ecosystem structure through earthworks.					
This first approach is the more easily implemented one and is suitable for various scales, from the planting of a few individual plants to re-forestation efforts. This approach can be easily phased over multiple years in response to resource and funding availability. Although simple, the act of establishing native plant communities can often achieve significant restoration outcomes. St. Albert's REEP initiative is a successful example of this. REEP has established native riparian plant communities along the Sturgeon River in areas that were once mowed turf.	<i>Restoration initiatives including Arbour Day, River Edge Enhancement Plan, Group Naturalization Projects, Environmental Initiative Grants, Grey Nuns White Spruce Forest Management Plan already in place.</i>				
The second approach, enhancing physical ecosystem structure through earthworks, is a more ambitious one and is often a more complex, costlier effort that involves larger areas. Restoration projects following this approach will likely require the involvement of engineers, construction contractors and other specialists. In our city, this approach may be suitable for naturalizing channelized reaches of Carrot Creek or installing erosion protection infrastructure in erosion prone areas along the Sturgeon River. As our City grows, ecological restoration, at several local scales, will be considered an important tool to	<i>Restoration initiatives including River Edge Enhancement Plan, Grey Nuns White Spruce Forest Management Plan already in place.</i>				<i>Will need further research and studies if City pursues earthwork restoration projects such as Carrot Creek.</i>

maximize the sustainability of natural areas, provide for ecological connectivity in an urban landscape and enhance the functionality of natural areas already within the developed core of the City.				
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<p>13. NATURAL AREA CONSERVATION PERFORMANCE MONITORING</p> <p>The City will review and assess our conservation progress every few years, providing quantitative performance metrics that can be used to communicate with City Council and residents. Such an assessment will also help to identify the strengths and weaknesses of our conservation program.</p> <p>Tracking our performance will support our City's intention to continually strive for strengthened protection and sound management of its natural areas. The City will investigate an established evaluation protocol that tracks established metrics and incorporates them into the City's GIS database on an annual or biannual basis.</p> <p>In all cases, the City will consider selecting and defining metrics to align with performance indicators being used by other jurisdictions in the surrounding region (e.g., the Province's North Saskatchewan Regional Plan). The City will include the above metrics in their annual reporting on the state of the environment.</p>					
<p>The following are potential metrics:</p> <ul style="list-style-type: none"> • Total number of natural area sites and hectares lost, partially lost, protected and restored. • Total number of natural area sites and hectares planned to be lost, partially lost, protected or restored, as outlined in approved planning documents. • Total tree canopy lost and gained. • Metrics related to special status species and ecological connectivity. 	<p><i>Some metrics recommended as part of the Environmental Master Plan and Urban Forest Management Plan.</i></p>		<p><i>Other capital region municipalities already pursuing metrics.</i></p>		<p><i>Further research and/or consultation on new metrics.</i></p>

B. NATURAL AREAS MANAGEMENT PLAN

“Adopt a minimum intervention approach that promotes natural areas remaining natural, addresses unintended adverse effects resulting from human use and reduces risk to human safety and property.”

1. VEGETATION MANAGEMENT OBJECTIVES AND ACTIONS
<p>Maintain and enhance the native plant species composition of Natural Areas.</p> <p>ACTIONS:</p> <ul style="list-style-type: none">• Monitor for concentrations of noxious and prohibited noxious weeds in, and immediately adjacent to, natural areas.• Improve the City processes in place to collect and investigate reports of noxious and prohibited noxious weed species and invite reports from the public.• Control weed species in accordance with the provincial Weed Control Act, the City’s Integrated Pest Management Plan and the Alberta Environmental Code of Practice for Pesticides.• Replant areas disturbed by human activity using a diversity of native plant species that are an appropriate match for that natural area. Locally sourced or salvaged materials are preferred.
<p>Maintain capacity of natural area vegetation to develop and undergo natural succession, Including experiencing natural disturbances (except fire).</p> <p>ACTIONS:</p> <ul style="list-style-type: none">• Restrict the active management of natural vegetation (e.g., clearing, cutting, pruning and mowing of trees, shrubs, naturalized grasses, and emergent wetland plants) to the minimum extent necessary to control weeds, maintain permitted recreational access, and reduce risk to human safety and property.• When required to manage hazard trees (i.e., dead or live trees that pose a risk of falling onto trails, fences or other infrastructure), leave as much of the tree standing as possible; top trees at a height that is less than the distance from the tree base to the margin of the tree stand, at-risk trail, or at-risk infrastructure.• Retain cut or downed woody debris in natural areas, unless it poses a significant fire risk and/ or begins to form excessive piles.• Control outbreaks of non-native plant pests and plant diseases in natural areas using the best management practices outlined in the City’s Integrated Pest Management Plan.• Control outbreaks of native plant pests and diseases in natural areas if they pose a significant risk of spreading widely, using the best management practices outlined in the City’s Integrated Pest Management Plan.

2. WILDLIFE AND HABITAT MANAGEMENT OBJECTIVES AND ACTIONS
<p>Maintain wildlife habitat value of Natural Areas.</p> <p>ACTIONS:</p> <ul style="list-style-type: none"> • When replanting disturbed areas, use native species that provide food and/or shelter for a variety of wildlife. • Manage natural area vegetation (including dead standing trees and woody debris), hydrology, and naturalized stormwater management facilities according to the guiding principle, objectives, and actions outlined in this plan, which are designed to maximize wildlife habitat value.
<p>Maintain documented populations of special status species.</p> <p>ACTIONS:</p> <ul style="list-style-type: none"> • When the special status species present is resident (i.e., not represented solely as migrating or dispersing individuals) and sensitive to disturbance through human use or management activities, develop species-specific and/or site specific management plans. Seek specialist advice when developing these plans. • Partner with Alberta Conservation Association or other agency to monitor populations of special status species, on an annual or biennial basis, beginning with species or sites that have or are likely to require their own management plan.
<p>Minimize wildlife mortality and disturbance.</p> <p>ACTIONS:</p> <ul style="list-style-type: none"> • Perform any necessary active management of vegetation (including trees, shrubs, meadows or naturalized grasses) outside of the bird nesting season (i.e., during the period August 21st to April 20th, as per Environment Canada guidance). If active vegetation management must be performed during the bird nesting season, have trained staff ensure that no wildlife will be affected prior to commencing necessary work. • Enforce on-leash and non-leash (off-leash) rules and requirements for domestic dogs as per the City’s Animal Bylaw within natural areas. Consider not designating new off-leash areas within natural areas. • Encourage cat owners to keep their cats indoors, especially near natural areas, as free-roaming domestic cats are an unnatural predator that can kill significant numbers of songbirds and small mammals. Refer cat owners to pertinent information regarding cats on the City’s website. • When direct management of wildlife is required because of actual or imminent damage to infrastructure or property, use humane live trapping instead of lethal means and relocate trapped animals to locations, approved by a Professional Biologist, having appropriate habitat, at a distance that accounts for that species typical home range size, thus discouraging a return to the site. The City will consider updating pertinent sections of the Integrated Pest Management Plan to reflect this approach.
<p>Reduce wildlife morality in the vicinity of Natural areas</p> <p>ACTIONS:</p> <ul style="list-style-type: none"> • Develop a process to collect and investigate reports of wildlife-vehicle collisions. • Erect wildlife-crossing signs, or consider other mitigation measures, at roadway locations adjacent to natural areas documented to have a high frequency of wildlife crossings and/or wildlife-vehicle collisions. • Maximize the functionality of installed wildlife crossing structures by ensuring they are properly maintained on an annual basis, beginning with a spring inspection. Look for impediments such as crushed, filled, hanging or undermined culverts/structure, failed or mowed vegetation, and eroded slopes.
<p>Reduce wildlife property conflict in the vicinity of natural areas.</p> <p>ACTIONS:</p>

- Maintain helpful links to provincial and municipal **sanctioned wildlife-property conflict prevention** and resolution protocols on the City website.
- In response to complaints of vermin, such as voles, **mow an approximate 3 m wide buffer strip** along adjacent property lines in early August, and mid to late September to discourage animal dispersal from the site into adjacent lots. The City will consider updating pertinent sections of the Integrated Pest Management Plan to reflect this approach.
- Assist residents with mitigating nuisance wildlife activity on adjacent lots on an **as-needed basis** as per the Integrated Pest Management Plan.
- **Remove beaver dams when flooding poses a risk of damaging private or public infrastructure.** Consider and evaluate potential impacts to downstream areas before removing any dams. A provincial license may be required to conduct beaver management. Consult the City's Beaver Management Guidelines in the Integrated Pest Management Plan, the Public Works department and Alberta Fish and Wildlife before acting.

3. HYDROLOGY MANAGEMENT OBJECTIVES AND ACTIONS

Maintain natural hydrology of natural areas.

ACTIONS:

- **Monitor for unnatural ponding of water** (i.e., not present in natural, pre-development conditions) resulting from development impacts. If ponding has the potential to cause substantial change in the plant community, consider possible mitigative options in consultation with Public Works.
- Where post-development hydrological change is a concern (e.g., at a retained wetland), **monitor post-development hydrology**. Consider mitigative measures as required. Such measures may include maintenance of drainage infrastructure (e.g., clearing blocked culvert) or modification of overland flow patterns. Mitigation measures must be developed in response to specific situations. Specialists may need to be consulted regarding development of mitigation measures.

Promote good water quality of Natural water bodies

ACTIONS:

- When controlling weeds in close proximity (<30 m) to water bodies, **use manual weed removal where possible**, in accordance with the provincial Weed Control Act, the City's Integrated Pest Management Plan and Alberta's Environmental Code of Practice for Pesticides.
- **Use only natural methods when controlling blue green algae** within water bodies accessible to the public.
- **Restrict the active management of natural vegetation** (e.g., clearing, cutting, pruning and mowing) to the minimum extent necessary within 30 m of water bodies. Robust riparian plant communities will help to remove pollutants and excess nutrients from water.
- **Discourage or limit use of fertilizer** on public lands within 30 m of natural water bodies.
- **Educate neighbouring residents regarding the relationship between fertilizer and algae, as well as other potential impacts that residents' activities can have on wetland ecology.** Partner with organizations that can provide educational materials and programs (e.g., Nature Alberta's Living by Water program) related to ecologically minded living near urban water bodies.

4. NATURALIZED NSWMF MANAGEMENT OBJECTIVES AND ACTIONS

Achieve naturalization of NSWMFs as soon as possible.

ACTIONS:

- In early years following construction, **monitor vegetation establishment and, if possible, manipulate NSWMF water levels to facilitate establishment of desired vegetation** communities, while abiding by facility design and stormwater release policies. Lowering the water level in August/September to mimic natural wetland conditions can foster improved wetland plant community establishment.
- **If necessary, re-plant/re-seed native plants and adjust facility water levels.** This may be especially pertinent in years following extreme flooding events if die-off occurs and regeneration is not evident.
- **Restrict mowing and clearing near the water's edge** to promote the establishment and growth of natural wetland riparian communities, but mow one mower width or 3 m along adjacent property lines in early August, and mid to late September to discourage animal dispersal from the site into adjacent lots.
- During the first five years, **inspect for and control weeds three times per growing season** to allow native species to become dominate.

Create and maintain NSWMFs water quality conditions that support diverse aquatic ecological communities.

ACTIONS:

- **Do not use fertilizers** in manicured upland zones of NSWMFs and discourage the use of fertilizers on adjacent private lands to minimize nutrient inputs that support algal blooms.
- **Manage invasive species** (e.g., goldfish) in NSWMFs in consultation with the Province. The City will consider updating pertinent sections of the Integrated Pest Management Plan regarding approaches for managing aquatic pest species, as the need arises.

Prevent degradation of NSWMFs that could potentially result from high levels of human use.

ACTIONS:

- **Post notices (and information on possible fines) regarding prohibited activities where applicable** (e.g., no bicycles, no watercraft, no ATVs), particularly with regard to riparian buffers that are not yet fully established and which may be especially sensitive to disturbance.
- **Remove litter each spring and autumn**, including litter that accumulates in riparian buffers and emergent vegetation.
- **Correct occurrences of encroachment** (e.g., mowing naturalized/naturalizing areas and planting non-native species beyond property boundaries) by private landowners adjacent to NSWMFs.
- Where required, **revegetate human-disturbed areas within naturalized/naturalizing areas** using native plant species (see also Vegetation Management Objectives and Actions).
- **Post signage educating residents** adjacent to NSWMFs and recreational users regarding the design and ecological function of NSWMFs and the impacts of common human mis-uses.

Ensure that NSWMFs ecological function and stormwater management performance are complementary and sustainable over the long term.

ACTIONS:

- For older facilities, **inspect twice annually and control weed concentrations** as soon as they are identified, as required by the Weed Control Act.
- **Monitor sediment accumulation** in NSWMFs every five years and remove sediments if storage and performance decreases. When removing sediments, avoid or minimize direct disturbance of emergent vegetation. Physical disturbance to NSWMFs for sediment removal should be conducted between October-March to avoid wildlife disturbance.
- In cases where management actions result in a significant change to the operating water level, **monitor vegetation twice per growing season**, looking for weed infestations and manipulate water levels to encourage native plant establishment when necessary.

5. HUMAN USE AND SAFETY MANAGEMENT OBJECTIVES AND ACTIONS

Maintain natural areas in a manner that **ensures public safety while minimizing impacts to natural area ecology**

ACTIONS:

- **Clear trails, prune encroaching vegetation and manage hazard trees, and downed woody debris as required to achieve desired safety objectives** and according to the guiding principle, objectives, and actions for vegetation and wildlife habitat outlined in this plan.
- **Leave cut woody material** within the natural area, strategically and aesthetically placed in understory or parallel to trail edge.
- **Control fire risk as necessary** in consultation with the Fire Department.
- **Communicate hazards** associated with high flood risk areas, thin ice, unstable slopes, etc., to human users with signage or fencing on perimeter of natural area.
- **Enforce rules and requirements regarding removal of dog defecation** as per the City's Animal Bylaw. Provide dog waste bags and garbage receptacles on the outskirts of natural areas to discourage littering and encourage owners to clean up after their dogs.

Restrict human use of natural areas to designated areas and appropriate Low-Impact activities.

ACTIONS:

- **Clearly identify designated trails** and post notices that keeping to trails is required.
- **Post notices (and information on possible fines) regarding prohibited activities** where applicable (e.g., no bicycles, no dogs off-leash, no watercraft, no ATVs).
- **Discourage use of informal trails by blocking/ obscuring trail entry points** using boulders, downed woody debris, or plantings.
- **Seasonally close trails or other recreational access to natural areas** if warranted to protect sensitive wildlife from human disturbance or to protect humans from unsafe conditions (e.g., seasonally flooded areas).

Restore Natural areas damaged by human misuse

ACTIONS:

- **Remove litter**, particularly large items such as tires and shopping carts, discarded in natural areas.
- **Correct occurrences of private landowners encroaching into natural areas** (e.g., mowing naturalized areas and planting non-native species beyond private property boundaries) by instructing landowners to cease the activities causing the encroachment and re-vegetating/ re-naturalizing as necessary.
- **Educate landowners** regarding the benefits of limited encroachment.
- **During inspections, identify human-disturbed areas**, such as informal trails, within natural areas and track them as potential restoration projects using native plant species. Where associated damage is warranted, block trailheads with brush piles or boulders.
- **Post signage educating residents** adjacent to natural areas and recreational users regarding the impacts of common natural area mis-use.
- On an as-needed basis, **educate adjacent residents regarding the pros and cons of living next to a natural area**. Track instances and successes and if warranted, develop and distribute informational brochures.
- **Remove unauthorized structures** that compromise natural area sustainability and/or that have a potential to impact the safety of residents and/ or recreational users (e.g., fire pits, homeless camps).
- **Eliminate compost piles** from within natural areas through education of residents and by enforcing bylaws.

Raise the profile (and therefore the respect for) Natural areas prone to abuse.

ACTIONS:

- **Officially name natural areas** that are prone to abuse.
- **Create pamphlets** about named natural areas extolling the ecological services and other benefits they provide and the detrimental effects of common mis-uses and abuses.