Updated Nose Creek Watershed Water Management Plan (Final Draft)

Stakeholder Engagement Session III
City of Airdrie Council Chambers

May 11, 2018

Presented by: S. Riemersma, Palliser Environmental Services Ltd.
On behalf of the Nose Creek Watershed Partnership

Nose Creek Watershed Partnership

Palliser Environmental Services Ltd.

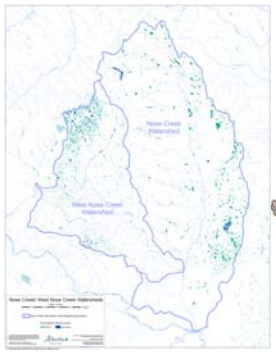
Stakeholder Engagement Objectives

- Provide an overview of the key changes made to the Nose Creek Plan
- Highlight implementation priorities and next steps
- Provide stakeholders the opportunity to ask questions regarding the key changes to the Plan, implementation priorities, and next steps

Agenda

12:45 pm	Doors Open
1:00 pm	Welcome and introductions
1:15 pm	**Presentation:** Updated Nose Creek Watershed Water Management Plan – Background – Key changes to the Plan – Implementation priorities and next steps
2:00 pm	Discussion
3:00 pm	Network, view display, leave comments
3:30 pm	Session ends

Nose Creek Watershed



- Size: 989 km^2
- Important tributary to the Bow River

Nose Creek Watershed

- Valued for:
  - Open space and recreation opportunities
  - Biodiversity
  - Contribution to water supply
  - Natural infrastructure that supports watershed resiliency

Land Use Changes

1969

2003

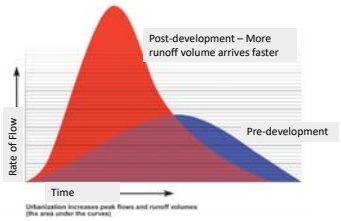
Loss of Channel Length

Loss of Natural Features

- Removal of natural vegetation
- Compacted subsoils
- Drained or filled-in depressions or wetlands
- Increased impervious surface area

Altered Hydrology

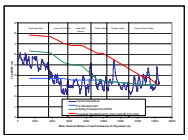
- Increased peak flow and runoff volumes



Increased Erosion and Sediment

Higher streamflow volume and peak flow result in:

- Increased streambank erosion
- Increased sediment transport
- Altered channel morphology

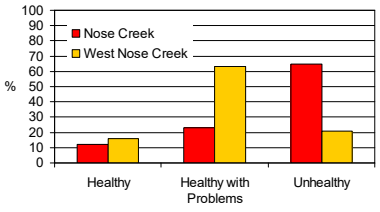


Poor Water Quality

- Nutrients (phosphorus)
- Conductivity (salts)
- Total suspended solids
- Fecal coliform bacteria
- Pesticides (Dicamba, MCPA)

Riparian Condition, 2000

(Cows and Fish 2001)



Nose Creek Watershed Water Management Plan

- Addressed issues to protect riparian areas and improve water quality
- Tools identified:
  - Water conservation objectives
  - Integrated Stormwater Management
    - Maximum Allowable Release Rates
    - Staged implementation of Runoff Volume Control Targets
    - Low Impact Development
  - Improved riparian policies and management
  - Mitigation of impacts, compensation for losses , and restoration of natural system

Measuring Progress

- Better water quality (fewer guideline/objective exceedences)
- Less sediment transported downstream
- Healthy, functioning riparian areas
- Trout migrating further upstream
- Improved land management practices to support the above

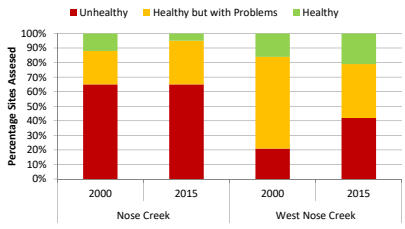
Implementation Highlights

- Riparian policies developed and incorporated in Land Use Bylaws
- Calgary's Riparian Strategy
- Measures taken to stabilize streambanks using bioengineering techniques

2007

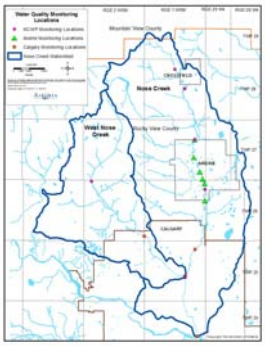
2014

Implementation Highlights



Few sites have been re-visited to make comparison. Many sites where condition was unchanged

Water Quality

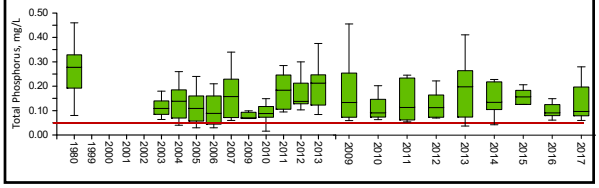


- Increased surface water and stormwater monitoring

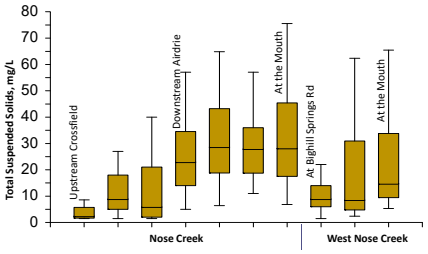
Water Quality (Total Phosphorus)

Nose Creek u/s West Nose Creek

Nose Creek @ Mouth



Water Quality
Total Suspended Solids (2009-2013)



Water Quality

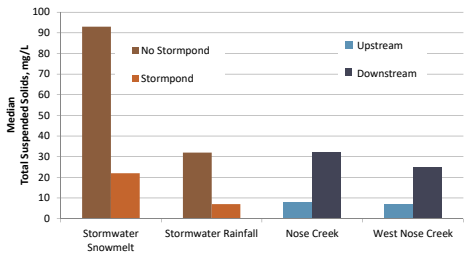
Average percentage of samples meeting applicable guidelines

Water Quality Parameter	Nose Creek		West Nose Creek	
	1999-2001	2009-2013	1999-2001	2009-2013
Dissolved Oxygen- Chronic	69	80	76	97
Conductivity	38	40	91	85
Total Dissolved Solids	15	16	6	28
Total Phosphorus	2	5	15	34
Nitrate-Nitrite N	89	86	85	84
Fecal Coliform - Irrigation	42	56	45	51
Fecal Coliform – Recreation	76	79	83	78

Water Quality

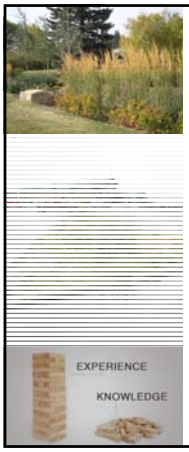
- Approved treated effluent release to Nose Creek once per year
- Resuspension of phosphorus from sediments
- Erosion
- Atmospheric deposition
- Stormwater (lawn fertilizers, dog parks, agricultural runoff, aged infrastructure)

Stormwater Quality and Surface Water Quality



Water Quality

- Salt management planning and improved salt storage facilities (indoors)
- Improved siting and infrastructure for snow storage locations - away from creeks
- Retrofits to existing infrastructure to include oil/grit separation and/or stormwater retention ponds
- Improvements to glycol storage ponds, including glycol recycling
- Application of on-farm beneficial management practices in rural areas



Low Impact Development

- Two rain gardens constructed
  - Mountainview and Winston Heights
- Stormwater quality retrofit projects
  - Coventry Hills Stormwater Wetland
  - McCall/Greenview Storm Pond
  - Airdrie
- Improving development design and construction activity

Brown Trout, d/s Harvest Hills Oct 9

Fisheries at West Nose Creek

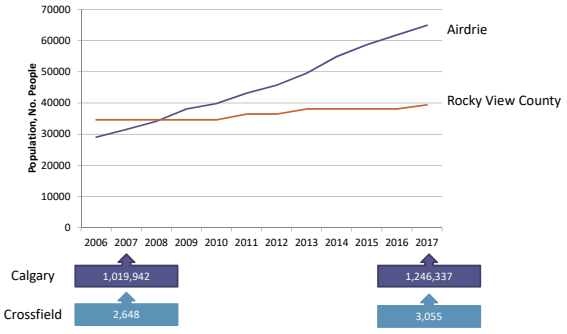
- Spawning and angling survey at West Nose Creek (2015-16)
- Juveniles and trout spawning observed

Redd downstream Harvest Hills

Trout spawning

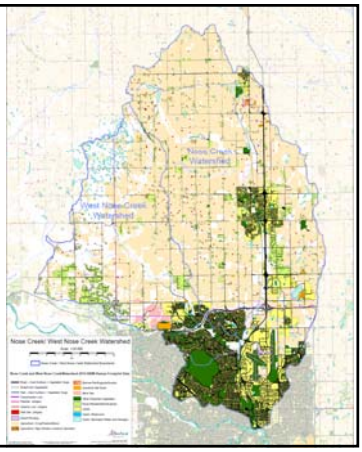
Photos: G. Woods, Bow Valley Habitat Development

Population Continues to Increase



http://www.municipalaffairs.alberta.ca/mc_official_populations

Cumulative Impacts



Updated Nose Creek Watershed Water Management Plan (Final Draft)

Planning Process

2016	2017	2018
• Completed Terms of Reference for Plan update • Hosted first stakeholder engagement session on issues • Data collection, synthesis & analysis • Hosted second stakeholder engagement session on key direction	• Continued to synthesize input • Engaged with municipal staff • draft updated Nose Creek Plan available for NCWP and Technical Team review	• Discussed implementation • Identified NCWP priorities • Hosted third stakeholder engagement session on final draft Nose Creek Plan • **To do:** Finalize Plan • **To do**: Renew municipal support for the Plan

Purpose, Intent and Authority

- Provides broad guidance and strategic direction for water management that will result in consistent, specific actions to protect riparian function and improve water quality
- Will continue to guide land and water management decisions in the watershed

Planning Framework

- Nose Creek Plan aligns with:
  - Renewed *Water for Life Strategy*
  - Alberta Wetland Policy
  - South Saskatchewan Regional Plan
  - Land Use Framework
  - Stepping Back from the Water
  - Alberta Surface Water Quality Guidelines
  - Bow Basin Watershed Management Plan
  - Bow River Phosphorus Management Plan

Scope of Issues

Riparian function (health) and water quality have been compromised in the Nose Creek watershed due to:

- Elevated flows from addition of stormwater resulting in streambank erosion and changes to stream channel morphology
- Encroachment by development and agricultural activity (i.e., infilling, channelization, grazing)
- Alteration and/or elimination of the native plant community and natural features that protect water quality

Plan Objectives

THEME	OBJECTIVES
Water Quantity and Stormwater Management	Recommend actions to manage streamflow and water quantity through the practice of integrated stormwater management.
Surface Water Quality	Identify appropriate surface water and stormwater quality guidelines.
	Recommend management actions to improve water quality.
Riparian Protection	Identify health targets, riparian setbacks, and other management actions that maintain functioning riparian systems in the watershed.
Groundwater	Recommend actions to better understand, manage, and preserve groundwater.
Biodiversity	Identify measures needed to sustain biodiversity in the watershed.

Stakeholder Engagement

Stakeholder Session	Engagement Session I Stakeholder Participants	Engagement Session II Stakeholder Participants
	May/June 2016	Nov/Dec 2016
Non-Government Organizations	8	5
Provincial Government	6	1
Municipal Government	36	23
Industry - Development	10	14
Total Participating	**60**	**43**

Updated Nose Creek Plan Goal

Protect riparian areas and manage streamflows in the Nose Creek watershed to mitigate impacts of flood and drought, and improve water quality for water users and aquatic life.

Recommendations

- Reflect stakeholder input
- Consider new information, plans and policies
- Reflect the ongoing need to protect riparian areas and improve water quality
- Supported by an Implementation Guide

Administration Recommendations

Stakeholder Input	Nose Creek Plan Recommendations
	Adoption • Adopt the goal, objectives and desired outcomes in the Nose Creek Plan • Consider recommendations in the development and update of municipal and provincial policies, procedures, and planning and development standards and guidelines **Governance** • Form an Inter-municipal Team to work together to aid with implementation (i.e., Technical Team plus additional staff as needed) • Continue to work internally with colleagues (internal working groups) to implement the Plan
Issue: General need expressed to increase communication and networks and report on watershed condition	**Communication with Stakeholders** • Host focus group sessions with stakeholders to discuss Plan implementation (e.g., successes, challenges, strategies to achieve objectives) • Monitor and report on indicators of watershed condition to support Plan implementation

Water Quantity and Stormwater Management

DESIRED OUTCOMES
- Degradation of natural hydrology and stream channel morphology is minimized.
- Through mitigation, the cumulative impact of urban development on watershed resources is minimized.

Stakeholder Input	Nose Creek Plan Recommendations
Issue: Lack of tools and monitoring data to validate assumptions and the effectiveness of BMPs	**Hydrologic/Hydraulic and Water Quality Model** • Develop a watershed-scale hydrologic/hydraulic and water quality model • Implement a surface water monitoring and streambank erosion monitoring program to support model
Issue: WCOs need to be evaluated given changes to channel morphology, water licences and use, environmental needs.	**Water Conservation Objectives** • Refine the low-flow water conservation (assess using model) • Manage high flows to minimize changes to the morphological characteristics of the creek channels in the upper reaches • Apply Maximum Allowable Release Rates

Water Quantity and Stormwater Management

Stakeholder Input	Nose Creek Plan Recommendations
Issue: Industry stakeholders expressed concern regarding the 2013 runoff volume control target and implementation of the 2017 target	**Runoff Volume Control Targets** • Delayed implementation of the 2017 runoff volume control target until Jan 2021; continue to implement the 2013 target • Advance provincial water re-use and stormwater use policy, guidelines, and performance criteria, and modelling tools to support implementation
Issue: Need for runoff volume control targets in redevelopment areas to improve watershed condition and to create a level playing field for all developments	**Redevelopment Areas** • Establish a redevelopment runoff volume control target and water quality objectives. Consider land use and parcel size. • Use absorptive landscaping, green roofs, soil cells and cisterns to manage runoff volumes in redevelopment areas constrained by space.
Issue: Delayed uptake of best management practices to achieve goals for water quantity, water quality and riparian health	**Low Impact Development** • Improve the timeliness and uncertainty of the approval process for LID projects, under the *Water Act*, Building Code, and others needed to achieve stormwater targets, by increasing flexibility

Surface Water Quality

DESIRED OUTCOMES
- Surface water and stormwater quality improve.
- Water quality condition supports a variety of uses, and aquatic life.
- The cumulative impacts of land use on water quality is minimized.

Stakeholder Input	Nose Creek Plan Recommendations
Issue: High nutrient concentrations in Nose and West Nose creeks that contribute to algal growth and poor water quality downstream	**Water Quality Guidelines and Objectives** • Surface water quality should meet objectives and guidelines • Explore Total Maximum Daily Loads as a mechanism to improve water quality **Stormwater Quality** • Explore opportunities to advance the development of stormwater quality guidelines and objectives

Surface Water Quality

Stakeholder Input	Nose Creek Plan Recommendations
Issue: Limited monitoring to measure improvements in water quality, streamflow, and channel morphology	**Monitoring** • Develop and implement a comprehensive, standardized surface water monitoring program • Continue to monitor stormwater quality
Issue: Discharge of treated effluent to Nose Creek from the Town of Crossfield, and the subsequent impacts to water quality and downstream users	**Discharge of Treated Effluent** • Seek an alternative means for treating and disposing effluent from the Town of Crossfield
Issue: Channelization (straightening) of Nose and West Nose creeks that reduces channel length, accelerates streamflow, increases erosion, and decreases sediment deposition in the floodplain	**Stream Channel Morphology** • Prevent the further loss of channel length and associated ecological functions through principles of "no net loss" and redesign • Restore actively eroding streambanks using bioengineering techniques, where possible

Surface Water Quality

Stakeholder Input

Issue: Managing soil disposal to maintain soil quality on agricultural lands

Nose Creek Plan Recommendations

Sediment Erosion and Soils
- Adhere to the Procedure for Topsoil Statutory Declaration and established Development permit processes for soil quality disposal requirements

Riparian Protection

DESIRED OUTCOMES
- Local and regional flood and drought mitigation efforts are supported.
- Contiguous and healthy riparian corridors maintain water quality and support biodiversity.
- Permanent watercourses naturally meander within floodplains.

Riparian Protection

Stakeholder Input

Issue: Tendency for development to encroach into riparian areas resulting in the need for relaxations of setbacks.

Issue: Concerns expressed by development industry regarding the implementation of riparian setbacks.

Nose Creek Plan Recommendations

Riparian Setbacks (Lotic Systems)
- Determine riparian setbacks for permanent watercourses
- Except for permitted activities, no further development or site alteration should be permitted in the setback, thus maintaining riparian lands in their natural state

Relaxations of Setbacks
- Relaxations of the riparian setback should not occur. When encroachment cannot be avoided through alternative design or management, mitigation measures should be applied to minimize the impact, and compensation for impacts should be provided.

Mitigation
- Prescribe BMPs during detailed design, and use routinely when working in and around riparian areas
- Compensation may be explored when all other options have been considered.

Riparian Protection

Stakeholder Input

Issue: Ephemeral and intermittent watercourses need to be properly defined and identified.
Comment: Challenges to maintaining these watercourses include site grading and road networks.

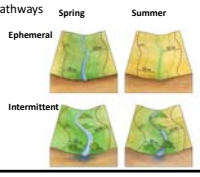
Issue: Recognizing the value of ephemeral and intermittent watercourses to overall watershed hydrology and water quality.

Loss of ephemeral and intermittent watercourses estimated to be 57% within Calgary city limits

Nose Creek Plan Recommendations

Ephemeral and Intermittent Watercourses
- Preserve ephemeral and intermittent watercourses in new developments, where possible.
- Strategically locate buildings, roads and structures to preserve the natural hydrology of ephemeral and intermittent watercourses

Riparian Setback
- Apply a minimum 10 m setback to ephemeral and intermittent watercourses. Up to 4 m of the outer edge of the setback may be used for critical infrastructure or pathways



Riparian Protection

Stakeholder Input

Issue: Lack of guidance regarding wetland values.

Issue: Loss of wetlands in urbanizing and rural areas.

Comment: Generally accepted that there are benefits to retaining wetlands in new developments, but only if they can be integrated into stormwater management plans.

Issue: The Alberta Wetland Policy has had unintended consequences. It is simpler and more cost-effective for industry to compensate for wetland loss than to retain wetlands.

Issue: Lack of guidance regarding wetland integration in developments.

Nose Creek Plan Recommendations

Wetland Inventory and Valuation
- Update the wetland inventory and assign values to wetlands

Wetland Setbacks
- Apply setbacks to wetlands

Wetland Retention
- Integrate wetland management into urban planning
- Adopt strategies to prevent wetland loss. Where loss is unavoidable, mitigate impacts, or restore/create wetlands in urban areas as part of water management infrastructure, provided that future criteria for wetland integration are met
- Amend the Alberta Wetland Policy to consider wetland integration in stormwater management

Guide to Wetland Integration in Urbanizing Areas
- Develop a guide to wetland integration in new developments and areas of redevelopment to support wetland retention

Groundwater Protection

DESIRED OUTCOMES
- Groundwater quality and quantity is protected for users and the aquatic environment.

Nose Creek Plan Recommendations

Source Water Protection Plan
- Develop a comprehensive source water protection plan focused on the groundwater resource

Abandoned Wells
- Identify and properly decommission abandoned water wells

Mitigation
- Apply appropriate BMPs to protect groundwater

Additional Research
- Increase understanding of springs and seeps, and the role of groundwater in the water balance

Biodiversity

DESIRED OUTCOMES
- Native plants support stable streambanks.
- Conditions for fish and aquatic life improve.
- Invasive species are managed appropriately.

Stakeholder Input

Issue: Brown Trout spawning habitat needs protection in West Nose Creek

Issue: Presence of invasive species in stormponds, creeks, and tributaries

Issue: Prevention of new threats (e.g., zebra/quagga mussels, whirling disease, invasive plants)

Nose Creek Plan Recommendations

Fish: Restricted Activity Period
- Update the Restricted Activity Period for West Nose Creek, relevant to Brown Trout spawning
- Protect and maintain spawning and rearing areas for Brown Trout in West Nose Creek

Invasive Species
- Document the occurrence of invasive species (e.g., Prussian carp, crayfish)
- Develop and disseminate educational resources for public users that highlight the threat of aquatic invasive species
- Continue annual effort to control and monitor invasive species with due care to native plants and water resources.

Nose Creek Plan Implementation Guide

- Contains implementation tables that:
  - Outline roles and responsibilities
  - Identify a cursory implementation timeline
  - Support more detailed and future work planning
- Recommendations should align with Partner priorities, work plans and timelines
- Many recommendations are inter-dependent
  - Further discussion needed to identify and refine partner priorities and implementation timelines

NCWP Priorities

1. Develop a hydrologic/hydraulic and water quality watershed-scale model
2. Design and implement a comprehensive, standardized water monitoring program
3. Initiate streambank erosion monitoring program
4. Complete a wetland inventory and valuation
5. Watershed condition reporting

Watershed Management Continuum

Next Steps

- Complete Stakeholder Engagement Sessions
  - May 14, 2018 – Fort Calgary, James O Wilson Boardroom
    - (1:00 pm to 3:30 pm, doors open at 12:45 pm)
  - May 17, 2018 – Rocky View County Council Chambers
    - (1:00 pm to 3:30 pm, doors open at 12:45 pm)
- Comments on the final draft will be accepted until June 15

Next Steps

- Finalize Nose Creek Plan
- Seek renewed support for the Plan from municipal partners, and from the province
- Continue to work collaboratively to achieve the outcomes of the Plan

Discussion

- Questions or comments
  - Water Quantity and Stormwater Management
  - Surface Water Quality
  - Riparian Protection
  - Groundwater Protection
  - Biodiversity