

# Watershed Health Report

## Health of the Nose Creek Watershed

2003 Issue



Where are you in this watershed?



Nose Creek Watershed  
M.D. of Rocky View April 2001



Water Quality



Riparian



Upland






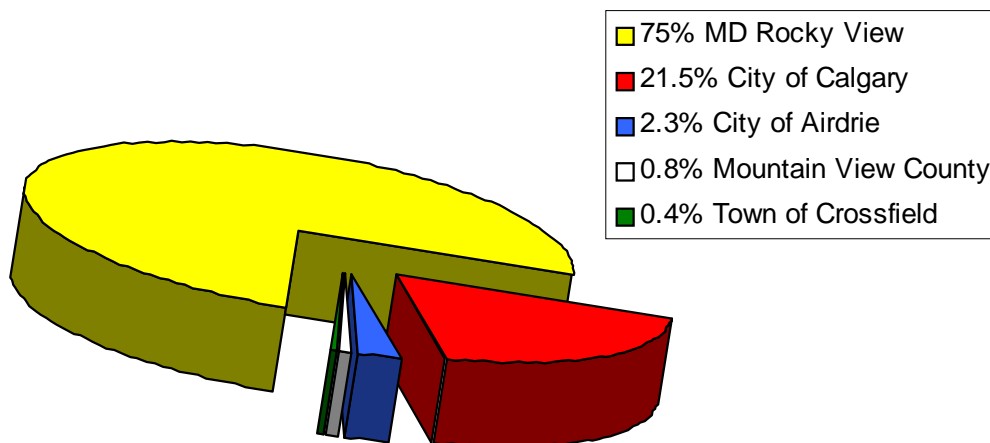
The Nose Creek Watershed Partnership commits to undertake a cooperative approach in addressing the water quality issues in the Nose Creek watershed.



MADAWASKA  
CONSULTING

# Report Summary

Grade	Watershed Component	Summary Explanation
<p>Poor - Nose Creek</p> <p>Marginal - West Nose Creek</p>	 <p>Water Quality</p>	<p>Based on 1999-2002 water quality results from the Nose Creek Surface Water Quality Data monitoring program. Grades followed the same index used in the Red-Bow Water Quality Mapping Project (Cross 2002). Other indicators of water quality included nutrients (poor), bacteria (poor), salinity (marginal) and pesticides (marginal).</p>
<p>Healthy with Problems</p>	 <p>Riparian</p>	<p>Cows and Fish conducted riparian health inventories (RHIs) on 30 km of Nose and West Nose Creek in 2000 using a Cows and Fish grading scale. Nose Creek had a grade of 60% with 12% healthy, 23% healthy with problems and 65% unhealthy. West Nose Creek had a grade of 70% with 16% healthy, 63% healthy with problems and 21% unhealthy. Wetland health could not be graded due to the lack of available data.</p>
<p>Not Available</p>	 <p>Upland</p>	<p>Lack of data and available expertise rendered upland grading unfeasible. Land use practices that influence the health of the Nose Creek watershed are both urban and rural. Urban land uses include transportation, buildings and recreation. Rural land uses include agriculture, ranching and natural landscapes.</p>



## About our Watershed:

- ✦ A watershed is the area of land that catches rain and snow and drains into a wetland, stream, river or lake.
- ✦ Our watershed is 244,377 acres or 98,900 hectares in area.
- ✦ This chart represents the percentage of the watershed in each municipality.

# Overall Grade for Riparian

## Healthy with Problems

Riparian areas are ecosystems that occur along watercourses, water bodies or wetlands. They are distinctly different from the surrounding lands because of unique soil and vegetation characteristics strongly influenced by free or unbound water in the soil. Riparian ecosystems occupy the transitional area between the terrestrial and aquatic ecosystems. Typical examples would include floodplains, stream banks, lake shores and wetlands.

Vision: Healthy, functioning riparian areas that contribute to our watershed.

### Riparian Health

Riparian health was based on riparian health inventories conducted by Cows and Fish in 2000. Inventory methods are great for monitoring change and gathering baseline data. Riparian health inventories involving 22 landowners graded as follows:

Assessment	Nose Creek	West Nose Creek
Km length	72.8	50.1
Km assessed	17.3	10.7
Healthy	12%	16%
Healthy with problems	23%	63%
Unhealthy	65%	21%

#### Grading scale for riparian health

Healthy

80-100%

Healthy with problems

60-80%

Unhealthy

0-60%

\*Based on Cows and Fish grading scale

#### Criteria

Healthy	Problems	Unhealthy	Other
Active lateral cutting, dead woody material, fine materials present, cover of flood plain	Channel incisement, human-caused bare ground	Canopy cover of woodies, altered stream banks, invasive plants, disturbance-caused plants	tree/shrub regeneration, tree/shrub utilization, root mass protection



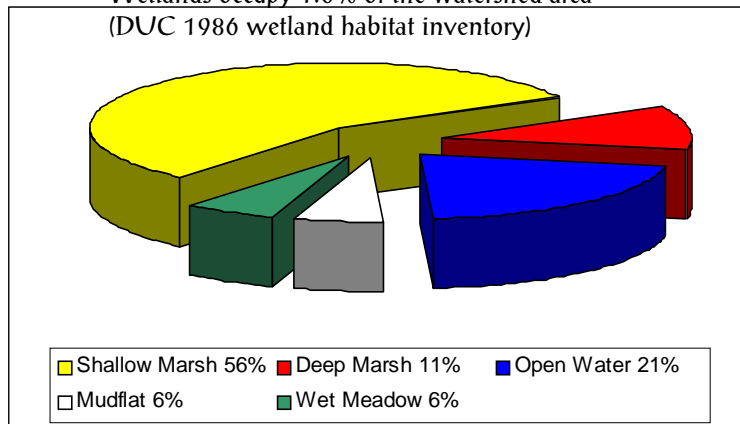
### Wetland Health

**No grade available** Presently, there are no wetland monitoring programs for Alberta's prairie wetlands. A prairie-wide wetland inventory project to monitor wetland gain and loss, initiated by Ducks Unlimited Canada (DUC), is projected in the near future.

In general, wetland health for southern Alberta prairie wetlands ranges from EXCELLENT to POOR, with the majority falling within the poor and marginal.\* Wetland health is based on its ability to perform functions such as groundwater recharge and soil moisture enhancement and the ability to provide waterfowl habitat and recreational resources. Major factors that influence wetland health are wetland loss and pollution from land use activities. The influence of climate change on wetlands is currently under study.

\*Based on an interview with wetland expert Gary Kindrat, Southern Alberta Watershed Coordinator from DUC.

Wetlands occupy 1.6% of the watershed area (DUC 1986 wetland habitat inventory)



Riparian and Wetland



# Overall Grade for Water Quality

Nose Creek - **poor**      West Nose Creek - **marginal**

Ensuring a clean and safe water supply is everyone's responsibility – get involved!

Everyone needs a safe, healthy water supply - for consumption, recreation, irrigation, livestock and maintaining the ecological health of our watershed.

Vision: To help improve water quality and quantity to meet community and ecosystem needs.

## Water Quality Indicators

Poor

### Nutrients

The high phosphorus levels in the water violated freshwater aquatic life guidelines. High phosphorus levels can lead to excessive algae and weed growth. This can affect oxygen concentrations creating problems for aquatic life and raise social concerns regarding recreational use and aesthetics for our watershed.

Poor

### Bacteria

Water is unacceptable for drinking and should be treated before human consumption. However water is acceptable for livestock watering. Recreational use (direct contact) carries some health risk and there is also some risk when using water to irrigate raw produce. Wash produce before consumption. Bacteria was rated **very poor** where Nose Creek flows into the Bow River.

Marginal

### Salinity

Irrigation guidelines indicate some risk of productivity loss for sensitive crops (e.g. raspberries) and loss of soil permeability. Salinity was rated **good** in West Nose Creek and the combination of West Nose and Nose Creek water resulted in a **fair** rating at the Bow River.

Marginal

### Pesticides

Dicamba and MCPA violated irrigation guidelines for sensitive crops indicating a risk to productivity. Pesticides were rated **good** in West Nose Creek and **poor** upstream of Airdrie. Pesticides were not used in the calculation for grading the overall result to provide consistency with other Red-Bow Regional Watershed Alliance results.

Good  
81-100%

Fair  
61-80%

Marginal  
41-60%

Poor  
21-40%

Very Poor  
0-20%

\*Based on water quality results collected from 1999 to 2002. Results were assessed against rural water quality objectives established for AESA (Alberta Environmentally Sustainable Agriculture), using the index developed for the Red-Bow Regional Watershed Alliance. The index was developed to give a message consistent with the AESA Stream Survey Reports.



Water Quality



## What these indicators mean

Indicator	What it measures	Why it is important to measure	Common sources
Nutrients	phosphorus (P) nitrate (N)	Indicates that plant growth may be stimulated	Fertilizers, human sewage, manure, soaps and detergents, soil erosion
Bacteria	Fecal coliform bacteria, <i>E.coli</i> (one species of fecal coliform)	Indicates that other potential viral, parasitic and bacterial contamination may be present	Intestinal tract of warm-blooded animals (human sewage, livestock manure, wildlife)
Salinity	Conductivity (EC) sodium adsorption ratio (SAR)	Indicates amount of dissolved solids in the water	Groundwater, surface runoff, human effluents, agricultural runoff, aerosol fallout
Pesticides	40 pesticide compounds, mostly herbicides - 14 were detected	Indicates that chemical compounds extend beyond intended target pests	Aerial drift, surface and subsurface runoff, careless application or spillage

### Additional Comments



**Sediment** movement off the land through erosion (water and wind assisted) is an important transport mechanism for contaminants.

**Metals** concentrations increasing along Nose Creek included aluminum, chromium, iron, lead, manganese, mercury, tin, titanium, vanadium.

**Non-point sources** of pollution include precipitation and agricultural runoff.

**Point sources** include wastewater effluent and stormwater outfalls.

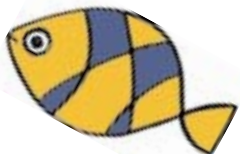
**Groundwater** assessments for MD of Rocky View are available from the County office.

These groundwater assessments give information on potential well yields, water quality information and show where aquifers are most at risk.

**Water Quantity** - There are a total of 96 licenses to withdraw water from the watershed; 62 for Nose Creek, 9 for West Nose Creek and 25 for other tributary sources including Beddington Creek and Big Spring Creek.

**Fish species** captured in 2001 at two sites in Nose Creek and West Nose Creek were white sucker, longnose sucker, longnose dace, fathead minnow, lake chub, brook stickleback and a goldfish.

**Citizen involvement** with the Yellow Fish Program sponsored by Trout Unlimited Canada.



This program supports painting a yellow fish symbol on storm drains to remind people that materials poured down the drain usually flow directly into the river untreated. Get your community or schools involved, visit [www.yellowfishroad.org](http://www.yellowfishroad.org)

**Did you know?**

That an average adult Canadian uses 343L of water a day! Where as in European countries, an average adult uses at least 150L. Our consumption rate is 2.3 times higher! (Env. Canada)



# Overall Grade for Upland

not available

## Managing your upland

to ensure a healthy watershed not only benefits your community, but the community downstream from you. What we put on the upland has potential to find its way into our water supply. Thus, understanding how land use management practices impact our watershed is an important step to improving its health.

Vision: To increase education and awareness about land use impacts on our watershed and promote the adoption of Beneficial Management Practices.

Land use describes the human-caused changes on the landscape of a watershed. The degree of impact a given land use has on an adjacent water body is determined by drainage, including distance of the land use to the water body, extent of overland flow and amount of directed surface runoff. The amount of impervious ground cover significantly affects drainage.

## Rural



Uses - agriculture, ranching, natural landscapes, acreages

Detrimental impacts of agriculture and ranching on rural drainage can result from the drainage of wetland areas or the conversion of riparian areas to pasture or cropland.

The location of concentrated grazing and watering sites for livestock can contribute to erosion and contaminant loading to water bodies. Beneficial management practices including controlled grazing distribution and timing, and off stream watering can reduce impacts.

The wind can transport fertilizer and pesticide residues and water eroded sources in cropland areas. Careful fertilizer, manure and pesticide management practices as well as land management practices to reduce erosion can reduce the movement of these contaminants off the land.

Intensive livestock operations and industrial runoff are regulated by the Alberta government.

## Urban

Uses - transportation (road, rail), buildings (residential, commercial, industrial), recreation (parks, pathways, golf courses)



The dominant characteristic of the urban landscape is the high degree of impervious ground cover. This can dramatically increase the rate and volume of runoff from rainfall or snowmelt. The fast moving water can carry more material off the land, increasing the amount of contaminants reaching the creek and downstream.

Management practices designed to slow down the runoff water include stormwater retention ponds, wetlands and detention areas in the urban landscape. Stormwater separators installed in storm drains can remove oil, sediment and other pollutants. New gas/service stations must have stormwater separator systems (Alberta government regulations).

Other management practices to reduce the input of contaminants from the land surface include fertilizer and pesticide management, street cleaning, spillage containment practices.

# Within the Nose Creek Watershed

## City of Airdrie pop (~22,000)

29 stormwater outfalls, water and wastewater tied into City of Calgary infrastructure, 72% residential, 22% industrial, 6% commercial, one stormwater separator located in the Public Works Yard, plus several private, Master Drainage Plan being undertaken, Planning - 30 meters from each side of the creek taken as Environmental Reserve, encourage development to maintain or enhance the natural riparian areas.

## City of Calgary pop (~230,000)

### Nose Creek

62 stormwater outfalls, 57% open space, 24% residential, 10% industrial, 4% commercial and 4% on-going development, 2% major roadways.

### West Nose Creek

9 stormwater outfalls, 64% open space, 30% residential, no industrial, less than 1% commercial, 4% on-going development, 1% major roadways.

The creek is highly channelized through developed land, often with small setbacks of development, Open Space Plan includes policies for pathways and recreational, environmental, inter-municipal and alternative use open spaces, Stormwater Management System includes guidelines for erosion and sediment control during development, Integrated Pest Management Plan designed to reduce reliance on pesticides and other chemicals, Wetland policy being developed.

## M.D. of Rocky View pop (~3,000)

Approximately 300 farmers, 15 intensive livestock operations and three industries operate in the watershed. Land use practices guidelines are being developed by the MD of Rocky View.

## Town of Crossfield pop (~ 2,300)

The Town uses an open ditch stormwater system. Wastewater is treated in a lagoon system prior to release to Nose Creek or use for irrigation. Wastewater treatment is regulated by the Alberta government. There is significant industrial area.

Studies indicate that roads contribute the most pollutants overall. Lawns in residential areas are major sources of phosphorus, roofs in commercial



Did you know



and industrial areas can contribute zinc, parking lots are responsible for the largest amount of polyaromatic hydrocarbons. Stormwater hot spots include gas stations, vehicle maintenance yards, cleaning facilities and loading and unloading facilities.

Healthy watersheds support a diversity of fish and wildlife.

## Channelization



*is* the deliberate human engineering of a stream channel in order to enlarge, straighten or divert the existing stream. Channelization dominates much of the creek inside developed areas. Channelization will shorten the creek length, move the water down the creek more quickly but reduce habitat for fish and wildlife, impact the re-aeration and the ability of the creek to purify itself by processing organic material and increase bank instability and erosion.

Naturally functioning riparian areas store and filter water. Their capacity to do so depends upon how we manage them.

Upland

# Actions

## Play a part in your community!

Join a watershed group or find out what you can do to improve things around your home or on your farm. Effective management of land-based activities by all communities located within the watershed will provide lasting improvements to Nose Creek water quality.

The **Nose Creek Water Management Plan** is in draft form and is a multi-phase approach to sustainable water management. The Plan will link the issues of water quality, water quantity, riparian habitat and aquatic species with the watershed's economic and social priorities. Each phase will establish these links and provide recommendations that will guide the community's activities for generations to come. Please provide your input into the plan by taking part in open houses, stakeholder meetings and web surveys.

## Community Watershed Groups Work - Contact Us

### Nose Creek Watershed Partnership Contacts

George Stalker, Watershed Coordinator, 948-8516

Airdrie Recycling Depot, 948-0246

Kevin Jordan, Town of Crossfield, 946-5878

Yin Deong, City of Calgary, 268-5741

Tim Dietzler, MD of Rocky View, 520-1271

[www.airdrie.com/environment/nosecreek/index.html](http://www.airdrie.com/environment/nosecreek/index.html)

### Awareness programs

Nose Creek Clean Up, Landowner meetings, Mayor's Environmental Expo, Airdrie Home and Garden Show, Nose Creek willow planting and harvesting

### Calgary

Utility bill inserts, information brochures, annual Water Quality Report, Erosion and Sediment Control courses, guidelines and field manual, Stormwater Management and Design Manual, Elbow Valley Constructed Wetland Tours for school children, Report to Calgarians on the environment (CFCN), Report to Citizens on the Environment (Calgary Herald supplement), direct contact with community associations and hand-delivered mailouts during Spyhill North Feedermain project that crossed West Nose Creek

### Rocky View

Beneficial management practices brochures available at MD office for agriculture, livestock watering, nutrients, riparian areas, grazing, horse owners, small farms and acreages

#### Around the home and farm

Beneficial Management Practices (BMPs) are practical ways to ensure that risks to the environment are minimized without sacrificing economic productivity.

### Airdrie

Pet Clean-up bags, integrated pest management and use of pesticides, cooking grease disposal brochure

Water is a valuable resource - learn to use it wisely! Learn some tips and tricks for saving water at home from [www.landstewardship.org](http://www.landstewardship.org).

Examples:

- Find and repair leaks
- Install weights in your toilet
- Use rain barrels
- Buy water efficient appliances

### 3 General Types of BMPs

BMP	Rural	Urban
Nutrient Management	Apply fertilizers and manures only in the amounts that a crop can take up. Excess applications can enter surface and ground water. Follow manure application guidelines by NRCB.	Apply fertilizers at recommended doses. Watch for overspreading and weather conditions to reduce movement off land.
Integrated Pest Management	Understand the target pest and use a combination of mechanical, chemical and biological control methods. Properly store, mix and handle pesticides. Apply herbicides at recommended rates. Spot spray rather than full coverage.	
Controlling Erosion and Runoff	Control erosion and runoff with barriers and buffers. E.g. strip cropping, shelterbelts and cover crops. Buffers include grassed waterways and healthy riparian areas.	Use erosion control methods during construction, landscaping. Wash cars in approved locations.

Learn how to conduct a riparian health assessment on your property. Contact your local watershed coordinator for more information. You can also visit the Cows and Fish website ([www.cowsandfish.org](http://www.cowsandfish.org)) for riparian fact sheets and publications.