

Managing Stormwater in Nose Creek Watershed

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The Nose Creek Watershed Partnership (NCWP) determined that stormwater runoff imposes increasing pressures on Nose Creek watershed health. Stormwater is precipitation and snowmelt. In natural areas, only small amounts of stormwater runs directly into rivers as most water soaks into the ground to gradually replenish groundwater or gets absorbed by plants and transpired back to the atmosphere.

Urbanization significantly alters the way water flows in a watershed. In urban areas, the impervious surfaces created by buildings and pavement speed stormwater and contaminant flow over the landscape into streams and rivers, rather than soaking naturally into the soil or being absorbed by plants. The unnaturally high volume and speed of urban stormwater runoff can change stream flows, increase flooding, damage or degrade infrastructure, erode stream banks, increase pollutant loads and adversely impact aquatic species. With the significant urban development occurring in Nose Creek watershed, adverse effects of stormwater runoff are an increasing issue.

Stormwater accumulates a variety of contaminants as it runs over lawns, sidewalks, streets, parking lots, compacted soils, industrial areas and agricultural land before entering streams. Activities that may appear insignificant at their source can produce contaminants then transported by rain and snowmelt into storm drains and eventually flush into rivers and lakes. This type of pollution is often called non-point source pollution because it comes from multiple sources, making it difficult to control. Common contaminants found in stormwater include nutrients, sediments, vehicle byproducts, heavy metals, pesticides, fertilizers, bacteria and toxins. Stormwater carrying contaminants and entering rivers and streams impacts the quality of water in the watershed.



During land development, it is critical to keep soils from eroding off the land and into waterbodies.

the data gathered in the Water Quality Monitoring Program, the NCWP undertook a project to determine the phosphorus concentrations within the sediments in Nose Creek. The project gathered sediment samples at sites in Crossfield, Airdrie, Rocky View County and Calgary. The phosphorus data gathered will help NCWP prioritize focal areas for implementing Beneficial Management Practices (BMPs) to reduce phosphorus loading in the watershed. Initial findings facilitate identifying the sites that yield the most improvement from BMP implementation. The next phase of the phosphorus management plan will be to secure funding and then work with land-owners and residents to plan and implement BMP projects.

Phosphorus loading is one of many issues that require consideration in stormwater management. The impact of stormwater runoff on other water quality parameters, aquatic habitat, channel erosion, infrastructure and the overall hydrological process, also need attention when designing stormwater management plans.



It is always better to allow precipitation to soak into the ground where it falls.

In 2009, NCWP partners, including Rocky View County, The City of Calgary, City of Airdrie, Town of Crossfield and Calgary Airport Authority, implemented a five-year Water Quality Monitoring Program. Monitoring results revealed that many of the phosphorus samples exceeded the phosphorus level guidelines. Because Nose Creek is a tributary to the Bow River, high phosphorus levels in Nose Creek contribute to phosphorus levels in the Bow River.

NCWP partners choose to collectively develop a phosphorus management plan to address phosphorus levels in Nose Creek and the Bow River. To supplement

Conventional stormwater management systems typically convey stormwater directly to creeks, without consideration for water quality and stream health. Municipalities and land developers now recognize that managing stormwater in a way that protects natural hydrology and prevents contaminants from reaching the water is less costly and more environmentally beneficial than allowing urban runoff to degrade streams and attempting to restore them later.

Modern approaches to stormwater management such as green infrastructure, constructed or preserved wetlands and low impact development, slow the water down near its source, filter out pollutants, and allow the cleansed water to infiltrate into the soil to recharge groundwater supplies. Preserving natural hydrological processes in the watershed is an essential component of stormwater management.

Everyone has a role to play when it comes to stormwater management and improving the water quality in watersheds. Business, industry, landowners, residents, and every level of government can play a part. Municipalities oversee stormwater management at the development stage. Development plans should ensure that post-development flows do not exceed pre-development flows and address protect water quality and aquatic habitat. Provincial government sets standards and guidelines for municipal waterworks, wastewater and storm drainage systems. The province also gives approvals and permits under the Water Act and Environmental Protection and Enhancement Act. Business and industry can have corporate policies in environmental management systems to ensure that business activities do not have adverse impacts on stormwater.

Individual landowners and residents also have a responsibility to manage stormwater runoff. There are a number of small changes anyone can incorporate into day-to-day activities that improves stormwater quality:

- Use gravel, interlocking stone or brick instead of impervious concrete or asphalt.
- Direct eave troughs into rain barrels or over lawns rather than to storm drains or ditches.
- Dispose of household hazardous wastes at collection depots; never dump directly into storm drains.
- Sweep driveways and sidewalks instead of hosing them off.
- Maintain your onsite sewage system well and ensure it meets your requirements;
- Collect pet wastes and bury or flush them down the toilet.
- Reduce your fertilizer and pesticide use. If you must use them follow instructions carefully.
- Grow native plants in your garden - they require less water, fertilizer and pesticides.
- Plant trees, shrubs and plants to slow water running off your property and increase absorption.
- Cut only the top 1/3 of your lawn for a healthier lawn that absorbs rain and filters sediments.
- Fix leaks or problems with your car's fuel, oil, brake, transmission, exhaust and cooling systems.
- Wash your car over gravel or grassy area, rather than the driveway. Go to a car wash if necessary.

For more information on the NCWP stormwater management visit www.nosecreekpartnership.com or contact one of the NCWP partners.



Unnaturally high water flows erode banks, contaminate water and dry out natural water storage systems.