BLUE MOUNTAINS SUBWATERSHED Health Check 2023

Blue Mountains | Clearview | Collingwood | Grey Highlands | Wasaga Beach





The Nottawasaga Valley Conservation Authority is your public agency dedicated to the preservation of a healthy environment. As your partner, the NVCA provides the expertise to help protect our water, our land, our future.



WHAT IS A SUBWATERSHED HEALTH CHECK?

NVCA's 2023 Subwatershed Health Checks provide an overview of forests, wetlands, stream and groundwater health across the NVCA watershed between 2017 - 2021. They also identify stewardship priorities, future challenges and opportunities to improve environmental health.

Watershed health checks were completed for all nine of NVCA's subwatersheds in 2023, and are produced every five years. Our science monitoring staff collects samples from forests, wetlands, streams and groundwater for data analysis. Our stewardship staff uses this information to determine the success of past restoration projects and areas in need of improvement.

NVCA began producing Subwatershed Report Cards in 2007. In 2013, they were renamed to Watershed Health Checks in an effort to differentiate these reports from Conservation Ontario's province-wide Watershed Report Cards.

What is a subwatershed?

A subwatershed is a smaller watershed within a larger basin. The water from the subwatershed contributes to a stream connected to the main river. In the NVCA watershed, this river is the Nottawasaga River. Everything in a subwatershed is connected, meaning our actions upstream can affect conditions downstream.

Nottawasaga Valley Watershed's nine subwatersheds

Blue Mountains Subwatershed Middle Nottawasaga River Subwatershed

Boyne River Subwatershed

Pine River Subwatershed

Innisfil Creek Subwatershed

Upper Nottawasaga River Subwatershed

Lower Nottawasaga River Subwatershed Willow Creek Subwatershed

Mad River Subwatershed



WHAT WE MEASURED

We measured the status and health of the forests, wetlands, streams and groundwater in each subwatershed. We also reported the number of stewardship projects that were completed from 2002 to 2021.



Forest Conditions



Wetland Conditions



Stream Health



Groundwater Quality



Watershed Stewardship

Why Measure?

Measuring helps us better understand our watershed. With this information, we can better target where planning and restoration is needed and track progress of watershed conditions.

OUR GRADING SYSTEM

VERY GOOD

An environment that is at or close to natural conditions

GOOD

An environment close to natural conditions with minor disturbance

FAIR

A disturbed environment

POOR

A highly disturbed environment

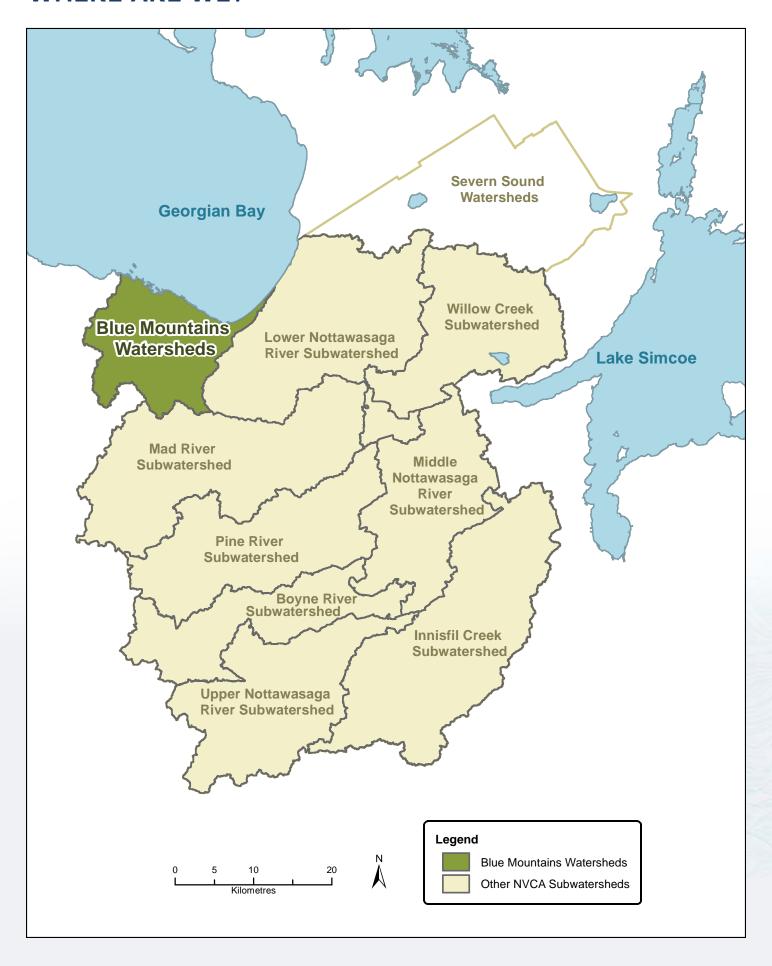
VERY POOR

An environment that lacks natural features

NO DATA

Not enough data to make a conclusion

WHERE ARE WE?



ABOUT THE BLUE MOUNTAINS SUBWATERSHED

The Blue Mountains subwatershed consist of four main creek systems – Silver Creek, Black Ash Creek, Pretty River and Batteaux River – that discharge directly to Georgian Bay within the Town of Collingwood. All four systems originate on the Niagara Escarpment – a World Biosphere Reserve.

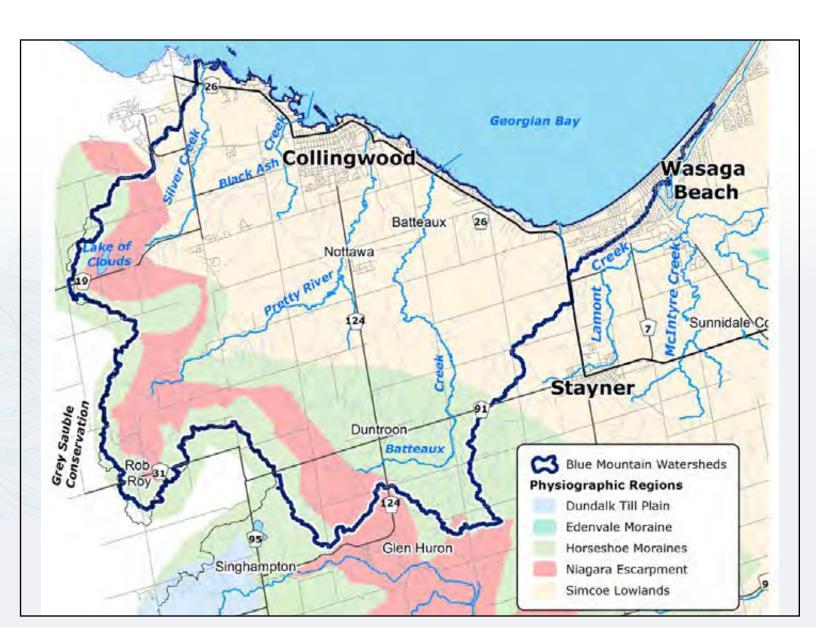
Silver Creek arises as a set of spring-fed tributaries on the Niagara Escarpment near Castle Glen. At Lake of the Clouds, the headwaters are impounded behind a large dam before cascading downstream through forested Escarpment terrain. Silver Creek enters the Simcoe Lowlands near Osler Bluff Road, flowing northward through a mosaic of forests, farm fields and rural residential areas before entering a large coastal wetland and discharging to the bay north of Highway 26.

The headwaters of Black Ash Creek emerge south of Lake of the Clouds with additional tributaries arising on the Simcoe Lowlands. The Escarpment branch flows quickly off the Escarpment into the Simcoe Lowlands where it meanders northeastward, picking

up flows from lowland tributaries through rural/ agricultural lands. At Collingwood, Black Ash Creek descends into a constructed flood control channel which extends downstream to Collingwood Harbour.

The Pretty River arises as a series of spring-fed tributaries on the Niagara Escarpment near Rob Roy. Cascading northeastward through Pretty River Valley Provincial Park, the river enters the Simcoe Lowlands near 33-34 Sideroad. The Pretty River then meanders through rural/agricultural areas, curving northward toward Collingwood where it flows through a diked flood control channel before discharging to Georgian Bay.

Batteaux River emerges on the slopes of the Niagara Escarpment southwest of Duntroon. Leaving the forested slopes of the Escarpment near Duntroon, the creek flows northward through a rural/agricultural landscape, entering Georgian Bay east of urban Collingwood.





FOREST CONDITIONS

Status: Good

Trend: Neutral

Around 10,000 years ago, parts of the Blue Mountain subwatershed were occupied by the ancient Lake Algonquin. Around 4,000 years ago, today's nearshore areas were submerged under the Nipissing Transgression (when Georgian Bay was higher in elevation). As these lakes disappeared, they left behind the landscape we see now: bluffs along the Algonquin shoreline and troughs and ridges along the previous Nipissing shoreline. The Blue Mountain subwatershed supports moderate forest cover. Large forests provide significant habitat for wildlife species that require forest interior habitat (deep, undisturbed forests) to thrive.

Fragmented forests are present along the ancient Algonquin bluff and the ancient Nipissing shoreline. East of the Escarpment, forest cover is fragmented with land use generally dominated by agriculture while the Collingwood/Wasaga Beach urban areas dominate the Georgian Bay shoreline.

Wetlands form a large portion of forest cover in this watershed. Coastal wetland systems along Georgian Bay are globally and provincially rare, and consist of rich coastal fens along the shoreline. Away from the shoreline, wetland features become more thicket-like before changing over to swamp forests.

Large forests are common within the Niagara Escarpment headwaters (river source areas). These rich forests are provincially significant and support a number of rare plant and animal species including Hart's-tongue Fern and Louisiana Waterthrush. Coniferous and mixed forests in the Pretty River headwaters provide important winter habitat for deer

As shown with orange arrows in the map, the headwater forest cover in the Blue Mountain subwatershed forms an integral part of the Niagara Escarpment's natural corridor. It is also connected to nearby forests and wetlands within the Beaver River valley to the west as well as the Mad River subwatershed to the south. Lowland forests provide an important corridor for migrating waterfowl and shorebirds along the Collingwood and Town of Wasaga Beach shorelines.

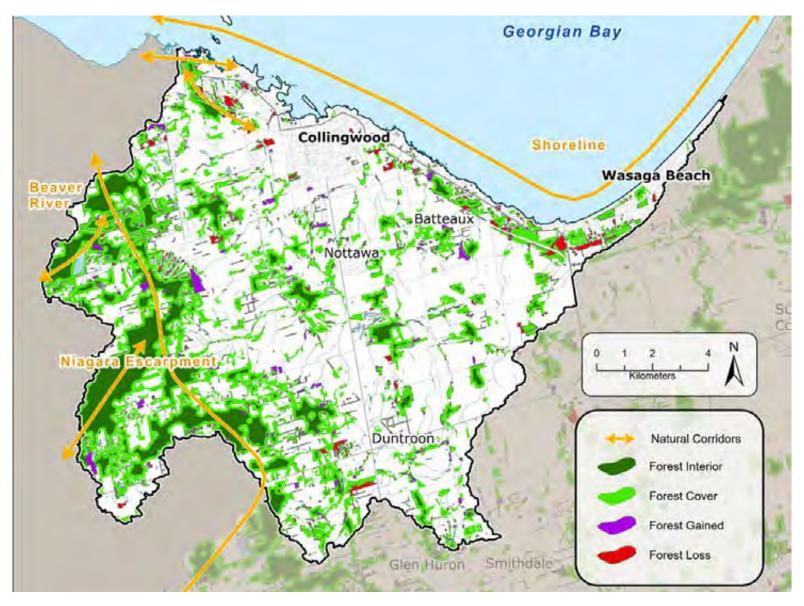
Although forest conditions remain Good, forest cover declined by 1.2% (83.3 ha) between 2008 and 2018. Forest interior increased by 3.5% (60.46 ha) over this time period. Remaining forest cover has likely been bolstered by adjacent forest regeneration, increasing forest interior.

Indicators	Blue Mountains Subwatershed	NVCA Watershed	Indicator Description	Trend (2008-2018)
Forest Cover	30.9% (6,871 ha)	32.2%	Forest cover is the percentage of the watershed that is forested. Environment Canada suggests that 30% forest cover is the minimum needed to support healthy wildlife habitat; more coverage is beneficial.	-83.3 ha (-1.2%)
Forest Interior	8.1% (1,792 ha)	10.2%	Forest interior is the area of forest that lies more than 100 m from a forest edge – away from the windy, dry conditions and predators that are associated with the edge. Sensitive forest birds, mammals, reptiles and amphibians require deep forest habitat for survival. Environment Canada suggests that 10% forest interior cover is the minimum needed to support a range of species.	+60.5 ha (+3.5%)
Riparian Cover	68.2% (1,658 ha)	68%	Streamside vegetation (riparian cover) filters pollutants and provides important fish and wildlife habitat. Environment Canada suggests that at least 30 m on each side of the stream (over 75% of its length) should be in natural cover to support healthy streams.	

Rating Scale:

VERY GOOD GOOD FAIR POOR VERY POOR NO DATA







WETLAND CONDITIONS

Status: Fair

Trend: Declining

Wetlands play an important role in the ecological health of a subwatershed. They improve water quality by filtering runoff from agricultural and urban areas. Wetlands control flooding, reduce erosion and help maintain stream flows during dry periods by holding back water on the landscape. The wetland swamps, marshes and fens in the Blue Mountain subwatershed provide habitat for a rich variety of plants and animals. Many animals that live in wetlands also depend on nearby upland habitats for nesting, foraging and hibernation.

Wetland cover in the Blue Mountain subwatershed is Poor compared to Environment Canada's wetland habitat guidelines. However, steep slopes on the Niagara Escarpment and generally well-drained soils in much of the subwatershed suggest that naturally-occurring wetlands may not have been historically abundant.

Past urban development has resulted in significant wetland loss along the Georgian Bay shoreline. Data from Ducks Unlimited Canada indicate 65.9% historical wetland loss in the subwatershed (1800-2002). From 2002 to 2016, an additional net wetland loss of 2.9% (36.7 ha) occurred.

In the Blue Mountain subwatershed, based on satellite photo interpretation, there was a net wetland loss of 17.8 hectares (ha) between 2016 and 2018. This represents a 1.2% decrease in wetland cover since 2016. Wetland loss (19.6 ha) was associated with development and agricultural conversion. Natural

regeneration in low-lying areas resulted in minor wetland gains (1.8 ha).

A mosaic of shoreline wetlands and lowland forests is present along the Georgian Bay shoreline, northwest of urban Collingwood. A fragmented series of swamps and lowland forests can be found in the mid-sections of the Pretty River, Batteaux River and along the Georgian Bay shoreline, southeast of Collingwood.

Coastal marsh wetlands are formed over gently sloped limestone bedrock along the Georgian Bay shoreline from Collingwood to the west end of Wasaga Beach. These wetlands support rare plant communities in rich fens (an open wetland dominated by low shrubs, ferns, sedges and grasses) that are found only along the Great Lakes – and nowhere else in the world! The fens are maintained by naturally-fluctuating water levels in Georgian Bay and the low nutrient shoreline environment.

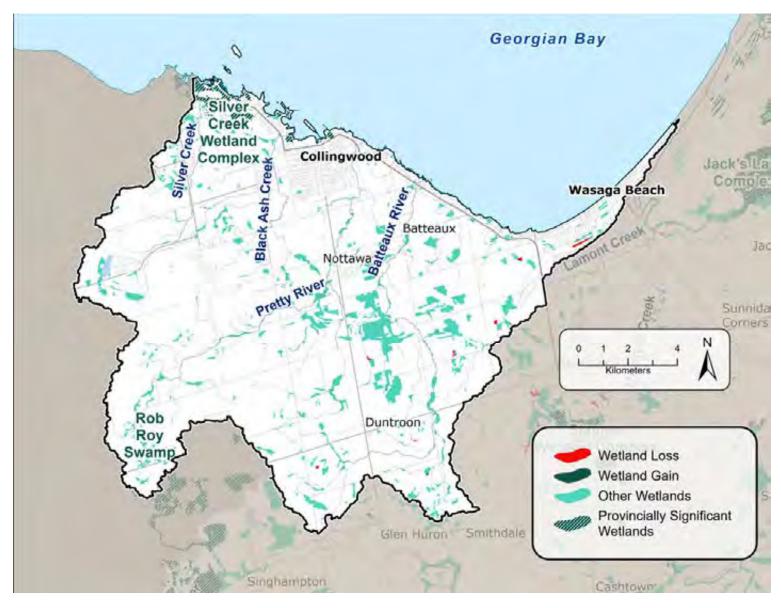
In the Blue Mountains subwatershed, the Silver Creek Wetland Complex and Rob Roy Swamp have been evaluated as provincially significant by the Ontario Ministry of Natural Resources and Forestry. Provincial and municipal planning policies help protect these wetlands from development and site alteration.

Indicators	Blue Mountains Subwatershed	NVCA Watershed	Indicator Description	Trend (2016-2018)
Wetland Cover	6.7% (1,500 ha)	14.5%	10% wetland cover has been identified as a minimum guideline for healthy watersheds (Environment Canada).	-17.8 ha (-1.2%)
Wetland Buffer (100m buffer area)	52.3% (2,017 ha)	49.6%	A buffer is a vegetated area next to a wetland or stream. Many wetland wildlife species require nearby upland areas for foraging, nesting and other activities.	Insufficient Data

Rating Scale:

 VERY GOOD
 FAIR
 POOR
 VERY POOR
 NO DATA







Status: Fair

Trend: No Trend

Stream health is determined by testing water chemistry and evaluating the health of benthic macroinvertebrates (water bugs). They are categorized as Unimpaired (very healthy), Below Potential (moderate health) and Impaired (very poor health). Final grades are determined by merging these two factors.

Stream health in the Blue Mountain subwatershed (including Silver Creek, Black Ash Creek, Pretty River and Batteaux River) ranges from Impaired to Unimpaired. Productive trout habitat is found throughout Silver Creek and much of the Pretty River but is limited to the headwaters in Black Ash Creek and Batteaux River.

In previous NVCA Watershed Health Checks, the spring-fed headwaters of all four major systems in the Blue Mountain subwatershed have been shown to provide a high quality, healthy Unimpaired source of water for the creeks above and through the Niagara Escarpment. These headwaters were not evaluated for this health check. Due to large manmade ponds in the headwaters of Silver and Black Ash Creeks, these two systems showed Below Potential conditions above the Escarpment.

Below the Escarpment, all four systems saw declines in stream health to Below Potential condition through the rural and agricultural landscapes in Clearview and rural Collingwood. The two rural systems – Batteaux River and Silver Creek maintained Below Potential health through to Georgian Bay. The two urban systems – Black Ash Creek and Pretty River experienced periods of Impaired stream health as they passed through their engineered flood control channels in urban Collingwood and into Georgian Bay.

Water quality monitoring on the four Blue Mountain watercourses at Highway 26 indicate that nutrient concentrations are good during low flow periods, indicating these streams are generally not nutrient enriched.

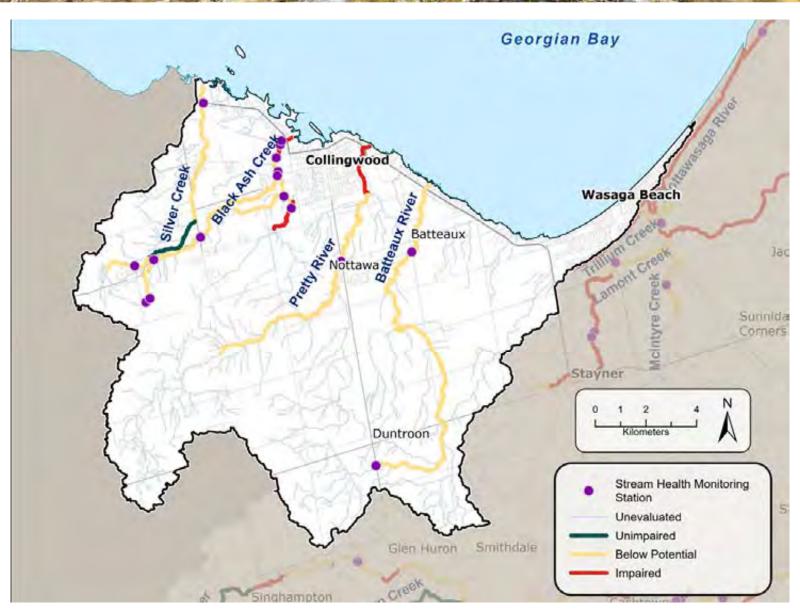
Overall, water quality in streams in the Blue Mountain watershed have shown small declining trends since the 2013 Watershed Health Check. Principal stressors in the watershed that may have contributed to the decline and future changes include: agricultural intensification, rural and urban development, ornamental ponds, and climate change.

Indicators	Blue Mountains Subwatershed	Indicator Description	Indicator Trend (2012-2016)
Benthic Grade	1.98	Insects and other "bugs" that inhabit the streambed are excellent indicators of stream health. Healthy streams receive a score of "3" while unhealthy streams receive a score of "1".	Declining
Total Phosphorus (low flow; mg/L)	0.01	Total phosphorus indicates nutrient levels within a stream. Our healthiest streams have levels less than 0.01 mg/L during low flow conditions. Blue Mountain range in all conditions: 0.006—0.235 mg/L. Provincial Water Quality Guidelines suggest that levels greater than 0.03 mg/L result in unhealthy stream conditions.	No Change

Rating Scale:

 VERY GOOD
 FAIR
 POOR
 VERY POOR
 NO DATA







GROUNDWATER QUALITY

Data availability: No Data Collected

Status: No Data Collected

Groundwater is water that is stored underground in soils and bedrock fractures. When it rains or when snow melts, water absorbs into the ground, eventually feeding local streams and wetlands or filter down into aquifers. Aquifers may be separated into different layers. Sediments that are relatively impermeable, such as clay and silt, offer protection by limiting the amount of water to flow into the aquifer. This layer is called an aquitard. Aquifers located below aquitards are preferred drinking water sources.

It is important to keep contaminants out of groundwater because it supports a variety of uses including municipal and private water supplies, agricultural irrigation, and is a source for rivers and streams. Contaminants can come from both urban and rural areas. Chloride and nitrate are used as indicators for groundwater quality. In urban areas, groundwater is susceptible to chloride due to excessive application of winter salt on roads and parking lots. In rural areas, nitrate in groundwater

can be due to excessive and improper use of crop fertilizers.

Staff from NVCA and the Province of Ontario have been working with municipalities, communities, and individual residents to reduce the potential for groundwater contamination. For opportunities to reduce these contaminants, please refer to the Watershed Stewardship section.

In the Blue Mountain subwatershed, there are 11 municipal wells providing drinking water to residents. Through the Provincial Groundwater Monitoring Network (PGMN) partnership with the Ministry of the Environment, Conservation, and Parks, NVCA monitors water levels and water quality.

There are currently no PGMN wells with the Blue Mountain subwatershed. NVCA continues to work with the Province and member municipalities to improve the PGMN coverage where feasible.

Indicators	Shallow Wells (0-20m)	Intermediate Wells (21-60 m)	Deep Wells (>60m)	Indicator Description	
Number of PGMN wells	0	0	0		
Chloride (mg/L)	No Data	No Data	No Data	The Ontario guideline for chlorides in drinking water is 250 mg/L and is based on aesthetic objectives. Drinking water should not exceed this level.	
Nitrite & Nitrate (mg/L)	No Data	No Data	No Data	The Ontario standard for nitrite and nitrate is 10 mg/L and is based on the maximum allowable concentration. Drinking water should not exceed this level.	
Results reflect health at the well and should not replace testing at private wells.					

Rating Scale:

VERY GOOD GOOD FAIR POOR VERY POOR NO DATA

Ontario's Drinking Water Source Protection Program

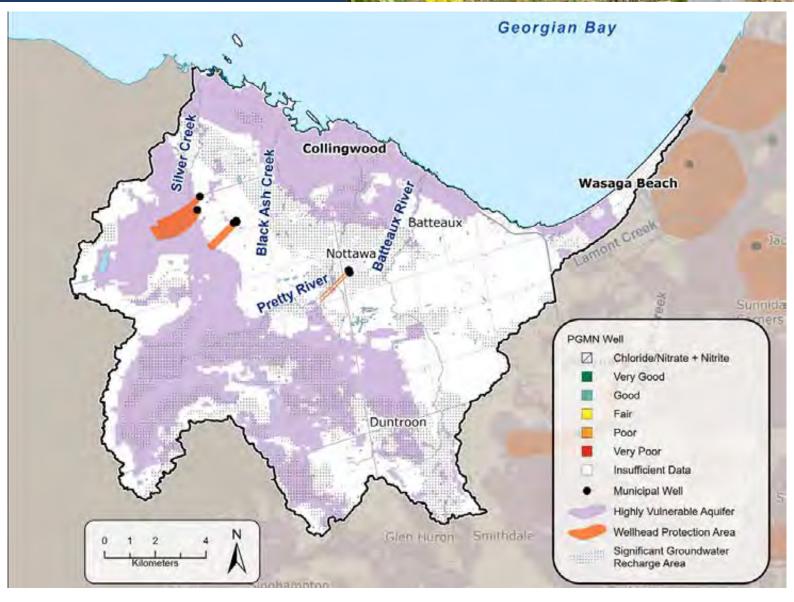
Focuses on protecting municipal drinking water sources, including:

Wellhead Protection Areas areas that contribute water to municipal wells,

Highly Vulnerable Aquifers areas where groundwater is close to ground surface

Significant Groundwater Recharge Areas areas which feed the aquifers.





WATERSHED STEWARDSHIP



What is Watershed Stewardship?

Watershed Stewardship and Restoration is the responsible and sustainable care of our natural resources and wildlife within a watershed.

Protecting what we have, and enhancing and restoring where possible helps the environment, and protects human uses as well. As caretakers of our environment, we all need to implement stewardship practices that protect and restore natural resources.

We all depend on good stewardship of private and public lands to achieve healthy waters and sustainable ecosystems. With almost 96% of land in our watersheds privately owned, residents can play a critical role.

Landowner Grant Assistance

To assist landowners with protecting the environment, NVCA's Stewardship and Forestry Programs provide technical assistance and a range of grant incentives to help offset the cost of projects on private property.

Grant rates range from 25% to 100% of eligible project costs.

To discuss your land management and stewardship goals

Call us at 705-424-1479



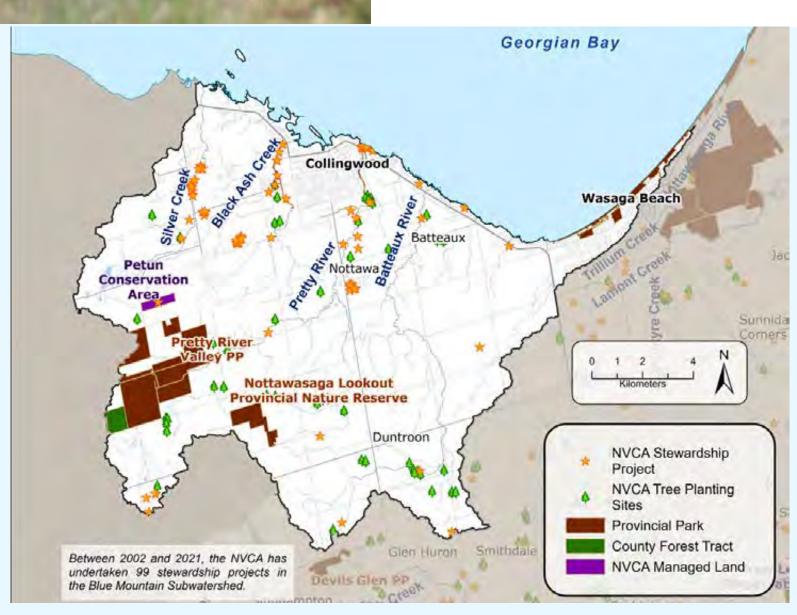


Forestry Program

NVCA's Forestry Program provides trees, planting services and forest management advice for landowners throughout the watershed. Between 2002 and 2021, more than 2.3 million trees have been planted on 669 properties, reforesting 1,384 hectares of land in the NVCA watershed. These future forests will help to moderate the effects of both drought and flooding, reduce soil erosion, provide habitat for wildlife, improve water quality and groundwater recharge, and mitigate climate change.

Healthy Waters Program

NVCA's Healthy Waters Program provides landowners with free site visits, technical and financial support for eligible projects, such as tree planting, well decommissioning, stream bank stabilization, exclusion of livestock from streams and wetlands, prevention of manure runoff and nutrient management. From 2002 to 2021, landowners in the Blue Mountain subwatershed have undertaken 99 stewardship projects on their properties through the support of this program. These projects have improved water quality, enhanced fish and wildlife habitat, protected species at risk, and prevented toxic algae blooms & fish kills.





RESTORATION PRIORITIES

Each subwatershed in the Nottawasaga Valley encompasses unique landforms and land uses. As a result, restoration priorities differ across subwatersheds to their local needs. Healthy waters depend on a healthy watershed; the lands that drain into them.

Engaging landowners, farmers and volunteers in voluntary, hands-on stewardship projects to restore and protect natural infrastructure creates climate resilient landscapes and communities. Habitat restoration of wetlands, rivers, forests, native

grasslands and certain farming practices help create carbon-rich, 'spongy' soils. Healthy soils increase flood attenuation, drought resilience, and reduce pollution-runoff. Other benefits include including reduced water pollution and maintaining cool river temperatures.

The implementation of the restoration priorities would not be possible without support from our partners including local municipalities, environmental groups, landowners and funders.

Restoration Priorities for the Blue Mountains Subwatershed

- 1. Complete stream-side tree planting, stream bank stabilization to restore habitat and exclude livestock from sensitive streams and wetlands along Silver Creek, Black Ash Creek, Pretty River and Batteaux River.
- 2. Help increase tree planting in partnership with the municipality of Collingwood.
- 3. Improve water quality and fish habitat by retrofitting dam structures to bottom discharge and removing dams in headwater reaches and tributary streams.
- 4. Support the construction of effective urban stormwater management systems in Collingwood designed to protect coldwater trout habitat.
- 5. Reduce flooding by increasing soil infiltration rates (speed at which water penetrates the ground) across the watershed by; increasing natural vegetation cover, protecting and restoring wetlands, encouraging farm soil health practices, and adopting low impact development techniques in urban areas.
- 6. Reduce soil erosion and runoff of nutrients (e.g. phosphorus) and fecal bacteria, to protect streams, lakes and groundwater. This can be achieved through agricultural stewardship practices, streambank stabilization and good septic care.

Before (2011)

After (2021)





HOW YOU CAN MAKE A DIFFERENCE

Farm Stewardship

- Upgrade manure storages; divert clean water from barnyards with eaves and berms
- Improve stream health by fencing out livestock
- Buffer streams from cropland and pasture (5-30m)
- Reduce soil erosion through conservation tillage, residue management and cover crops
- Reduce nutrient runoff and save money by implementing nutrient management planning
- Use water conservation measures and work with neighbours to coordinate water takings
- Urban Stewardship
- Conserve water in the home install low flow toilets and showerheads; and in the garden with rain barrels, mulch and rain gardens
- · Reduce use of fertilizers
- Don't pour anything down storm drains as these drains flow untreated into rivers and lakes
- Plant neighbourhood trees to moderate the effect of extreme heat and enhance urban spaces
- Support Low Impact Development to increase groundwater recharge and reduce urban flooding

Habitat Restoration

- Protect and create stream and wetland buffers
- Plant natural vegetation between the water and adjacent land use practices
- Stabilize eroding stream banks
- Plant native trees, shrubs, wildflowers and grasses to support birds, pollinators and wildlife
- Learn to identify, safely remove and reduce spread of invasive species

Drinking Water Protection

- Decommission unused wells to prevent surface contaminants from reaching groundwater unfiltered
- Test your well for bacteria at least 3 times per year (your local health unit provides free testing)
- Regularly service your septic system (every 2-5 years) and avoid using cleaning products (like bleach) that kills the beneficial bacteria, on which your sewage treatment depends
- Properly dispose of household hazardous waste and pharmaceuticals
- Clean debris from around your well and ensure the lid is vermin proof
- Reduce micro-plastic contamination by installing a filter on you laundry machine

NVCA'S EDUCATION PROGRAMS

NVCA's Environmental Education Program has been delivering high-quality programming for over 40 years. During 2009-2022, we have collectively interacted with more than 132,000 students whom have visited us at the Tiffin Centre for Conservation, or we have been invited to visit school yards and green spaces to deliver outdoor programming within their communities.

Our current inventory of over 40 different programs cover topics of Science and Technology, Art, Cultural History, Geography, Survival Skills and Outdoor Recreation which increasingly incorporates Indigenous ways of knowing. Further, the NVCA Education Program has always kept step with provincial curriculum while addressing real time environmental issues, opportunities and solutions.

As such, the most recent program developments have included a climate change program for elementary students, and will soon include one for secondary schools.

We hire professionals from a wide variety of expertise including Ontario College of Teachers educators, and graduates from science, environmental studies, music, art and recreation, creating a team rich in diverse skills, abilities and knowledge. This enables NVCA wto provide watershed students with the best knowledge and opportunities from the most qualified educator for the subject.

Fostering a sense of wonder, appreciation and respect for the natural world through experiential learning and outdoor exploration?



PUBLIC LANDS MANAGEMENT

NVCA's land acquisition program focuses on strategic land securement for the long-term protection of natural features and functions. These properties also provide valuable recreational opportunities to watershed residents. NVCA manages three property within the Blue Mountain subwatershed totaling 68 ha.

County Forests are managed for a variety of environmental, social and economic purposes. One Grey County Forest tract, the 72 ha Pretty River tract, lies within the Blue Mountain subwatershed.

Ontario Parks' mandate is "to protect significant natural and cultural resources in a system of parks and protected areas that is sustainable and provides opportunities for inspiration, enjoyment and education: now and for future generations." Ontario Parks manages three park areas (855 ha) within this subwatershed.

Many local municipalities also acquire and manage lands in the public trust.

IMPROVE YOUR ECOHEALTH IN OUR CONSERVATION AREAS

Natural areas clean our air, protect our water and can have a moderating effect on extreme weather. New research indicates that spending time in nature also provides important benefits that support mental health and emotional well-being.

NVCA owns and manages over 5,000 ha of land in the Nottawasaga River watershed, including 11 conservation areas with opportunities to hike, paddle, and fish. Here are some highlights of our conservation areas.

Tiffin Centre for Conservation

Located between Barrie and Angus, the Tiffin Conservation Area is home to NVCA's John Hix Conservation Administration Centre, and home to our Environmental Education Program. There are approximately 10km of looped trails that meander through a mixture of wetlands, forests, and open meadows. NVCA manages a portion of the Tiffin Conservation Area on behalf of its partner, Ontario Heritage Trust.

Minesing Wetlands

Minesing Wetlands acts as an important natural flood control reservoir. During periods of high water levels, the wetland fills with water and slowly releases it into the Nottawasaga River and into Georgian Bay, protecting downstream communities including Wasaga Beach.

In addition to being a flood control mechanism, Minesing Wetlands is recognized as an internationally significant wetland because of its unique plant communities and diverse wildlife. Visitors can paddle, snowshoe or cross-country ski in this conservation area.

Petun Conservation Area (in this subwatershed)

The Petun Conservation Area is a property managed by NVCA within the Blue Mountain subwatershed. Petun is one of the highest points within the watershed and is renowned for its beautiful vistas along the Bruce Trail. NVCA has an agreement with the Georgian Triangle Angler's Association to lease part of the property and to manage a fish hatchery.

Through Section 28 of the Conservation Authorities Act, NVCA has the responsibility to regulate activities in natural and hazardous areas in order to prevent the loss of life and property due to flooding and erosion, and to conserve and enhance natural resources. For more information, please visit our website at nvca.on.ca.



Did you know...

Land donations to Conservation Authorities may be eligible for tax benefits?

Contact NVCA about leaving a legacy gift of land.





Nottawasaga Valley Conservation Authority 8195 8th Line, Utopia ON LOM 1TO 705-424-1479 • admin@nvca.on.ca



Thank you to all of our landowners, community groups, schools, businesses, municipalities and other government agencies who support stewardship activities in our watershed!