This Health Check provides an overview of forest, wetlands, stream and groundwater health within the NVCA watershed. It identifies stewardship priorities and programs to improve environmental health. Healthy ecosystems sustain healthy communities – future challenges and opportunities for the watershed community are outlined. More detailed descriptions can be found in individual Subwatershed Health Checks.

The NVCA is one of 36 Conservation Authorities across Ontario and is a proud member of Conservation Ontario.

Our watershed is approximately 3,700 km², with jurisdiction in 18 municipalities and is the source of watercourses that flow into Georgian Bay at Wasaga Beach, Collingwood and Severn Sound. It includes 35 km of Georgian Bay shoreline along the Wasaga Beach and Collingwood waterfront.

The watershed is shaped like a bowl – the Niagara Escarpment (west), Oak Ridges Moraine (south) and Simcoe Uplands/Oro Moraine (north and east) represent the height of land along the edges of the bowl. Streams arise from these high areas and flow down slope into the Simcoe Lowlands (the bottom of ancient Lake Algonquin), which forms the bottom of the bowl. These lowlands extend to Wasaga Beach and Collingwood (a “chip” at the edge of the bowl) which allows the Nottawasaga River and Blue Mountain streams to reach Georgian Bay.

The NVCA watershed is largely rural in character, though urban areas such as Barrie, Alliston, Shelburne, Wasaga Beach and Collingwood continue to experience significant growth. Land use is dominated by agriculture; however, compared to many areas in southern Ontario, natural areas are a significant part of the landscape. Forests and wetlands are generally found in areas that are unsuitable for farming – where soils are too wet, dry, rocky or steep.

The Nottawasaga Valley Conservation Authority is a public agency dedicated to the preservation of a healthy environment through specialized programs to protect, conserve and enhance our water, wetlands, forests and lands. This Health Check describes the conditions of natural features within the subwatershed, as well as stewardship actions to help maintain the area. Health Checks for the NVCA watershed and subwatersheds can be found online: www.nvca.on.ca

Watershed indicators rating scale:
Forest conditions in the NVCA jurisdiction are generally good. Forest cover has recovered from historical lows in the early 1900s, but is currently under pressure from urban growth and agricultural conversion. Based on satellite photo interpretation, between 2002 and 2008 there was a net loss in watershed forest cover of 460 ha. This represents a 0.39% decrease in forest cover since 2002. Forest loss was generally associated with development activity and, to a lesser extent, agricultural conversion.

The Willow Creek, Pine River and Mad River subwatersheds and the Severn Sound headwaters have the highest percentage of forest cover and forest interior habitat in the NVCA jurisdiction. These areas collectively form an important natural corridor extending from the Niagara Escarpment to the Canadian Shield. Maintaining and enhancing ecological corridors will be important to allow forests and wildlife to adapt to climate change.

Watershed forests are also part of the Niagara Escarpment system and form an important natural linkage between the Escarpment and the Oak Ridges Moraine. Headwater wetlands west of the Escarpment are connected to similar habitat in the Grand, Saugeen, Credit and Beaver River watersheds. Forests and wetlands are also linked to natural areas northward to Severn Sound and eastward to Lake Simcoe. The Georgian Bay shoreline is part of an important corridor for migrating waterfowl and shorebirds.

**Did you know** that rare forest communities are present within the watershed? A mosaic of rare pine-oak woodland and tallgrass prairie is found in Wasaga Beach Provincial Park. The Minesing Wetlands hosts rare bur oak and hackberry forest swamps. The cliffs of the Niagara Escarpment support old-growth cedar stands.
Wetland Conditions

Wetlands play an important role in the ecological health of a watershed. They improve water quality by filtering runoff from agricultural and urban areas. Wetlands hold back water on the landscape, which controls flooding, reduces erosion and helps maintain stream flows during dry periods. The wetland swamps, marshes and fens in the Nottawasaga jurisdiction provide habitat for a rich variety of flora and fauna. Many wetland species also depend on nearby upland habitats for nesting, foraging and/or hibernation – these connected upland areas are needed to support these wildlife functions.

Wetland conditions within the NVCA jurisdiction meet Environment Canada minimum guidelines for healthy watersheds; however, historically more than 70% of wetlands in southern Ontario have been lost due to urban expansion and agricultural conversion. These pressures continue today. Based on satellite photo interpretation, between 2002 and 2008 there was a net watershed wetland loss of 254 ha. This represents a 0.57% decrease in wetland cover since 2002. Wetland loss was associated with agricultural conversion and development activity.

Large expanses of wetlands can be found on poorly drained lands west of the Niagara Escarpment and within the lowlands in the central portion of the watershed. Long, narrow wetlands are often found along river valleys as well as along the Georgian Bay shoreline.

The Ontario Ministry of Natural Resources has identified 33 wetland groupings within the watershed as provincially significant. Provincial and municipal planning policies help protect these wetlands from development.

Did you know that the Minesing Wetlands, located north of Angus, is recognized as an internationally significant wetland? It supports a number of rare plant and wildlife species and protects Wasaga Beach from flooding. The coastal wetland marshes along the Collingwood shoreline are found only in certain areas along the Great Lakes shorelines and are considered globally rare.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>NVCA Watershed</th>
<th>Indicator Description</th>
<th>Trend (2002-2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland Cover</td>
<td>12.3%</td>
<td>10% wetland cover has been identified as a minimum guideline for healthy watersheds (Environment Canada).</td>
<td>↓ 254 ha</td>
</tr>
<tr>
<td>Wetland Buffer</td>
<td>51.5%</td>
<td>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.</td>
<td>Insufficient data</td>
</tr>
</tbody>
</table>

2013 Nottawasaga Valley Conservation Authority Watershed Health Check
Within the NVCA jurisdiction, a network of streams and rivers arises from the elevated headwaters of the Niagara Escarpment, Simcoe Uplands and the Oak Ridges and Oro Moraines. Most rivers flow to the Nottawasaga River, which discharges to Georgian Bay at Wasaga Beach. The creeks and rivers in the Blue Mountain watersheds flow directly into the Bay in Collingwood. The Severn Sound headwaters flow northward out of our jurisdiction toward Severn Sound. Our jurisdiction also includes 35 km of Georgian Bay shoreline along the Collingwood and Wasaga Beach waterfronts.

Streams that flow through areas with healthy forest and wetland cover, such as those on the Escarpment, are generally healthy. Streams that drain highly urbanized or intensively farmed lowland areas are often unhealthy. Innisfil Creek is our most degraded watercourse system – impacts from this system extend downstream into the main Nottawasaga River.

Recent studies have confirmed that high nutrient (phosphorous) loading is the most significant water quality issue within the watershed. Runoff from agricultural and urban lands contributes to these high loads. Landowner and community stewardship actions aimed at reducing these loads are required to restore stream health.

Bacteria (E. coli) levels in watershed rivers and streams are highly variable and, depending on location, may be above those levels deemed safe for swimming. We recommend that swimmers use regularly monitored area beaches for recreation such as Wasaga Beach, Earl Rowe Provincial Park, Tottenham Conservation Area and New Lowell Conservation Area.

**Did you know** that the Nottawasaga River system supports one of the largest spawning runs of Rainbow Trout and Chinook Salmon in the Georgian Bay/Lake Huron basin? The river also supports critical spawning and nursery habitat for Lake Sturgeon – a threatened species.
Groundwater

Groundwater is water that is stored underground in bedrock fractures or between sand/gravel grains in aquifers. Groundwater sinks into the ground from rain or snowmelt then moves to spring and seep discharge areas, which feed streams and wetlands, or downward into aquifers. Aquifers may be separated by layers of fine-grained silts or clays (aquitards) that tend to block the downward movement of water. Aquifers located below aquitards are often protected from potential surface contamination and are preferred for drinking water sources.

Groundwater sustains stream flow and wetland levels during dry spells. It supports a variety of human uses including municipal water supplies, private water supplies and agricultural irrigation. More than 130 municipal wells and 10,000 private wells are located within the NVCA watershed. These wells provide drinking water for most watershed residents.

Ontario’s Source Water Protection initiative is focused on protecting municipal drinking water sources. Key areas of interest include 1) Wellhead Protection Areas (areas that drain down toward municipal wells), 2) Highly Vulnerable Aquifers (generally where groundwater lies close to ground surface) and 3) Significant Groundwater Recharge Areas (which feed our aquifers). Nitrates from septic systems and fertilizer use, *E. coli* from various sources, and sodium and chloride from road salting are potential sources of contamination.

Through the Provincial Groundwater Monitoring Program (PGMN) partnership with the Ministry of the Environment, the NVCA monitors water levels and water quality in 16 wells located in various aquifers throughout the watershed. 12 of these 16 PGMN wells have sufficient data for reporting on current conditions. Groundwater quality monitoring began in 2003 and is now being conducted annually. Monitoring data allows the NVCA to track changes in the groundwater levels and quality over time.

Results to date indicate that water quality parameters in all monitoring wells meet Ontario Drinking Water Quality Standards. Groundwater health in the NVCA watershed is considered very good. Additional data is required to interpret broad groundwater quality trends in the subwatershed.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>NVCA Watershed Monitoring Well Results*</th>
<th>Indicator Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shallow</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Chloride (mg/L)</td>
<td>2.25</td>
<td>30.29</td>
</tr>
<tr>
<td>Nitrite &amp; Nitrate (mg/L)</td>
<td>0.673</td>
<td>0.197</td>
</tr>
</tbody>
</table>

Chloride occurs naturally in the environment; however, high concentrations can indicate human impacts (e.g. road salt, landfills). The Canadian guideline for chlorides in drinking water is 250 mg/L and is based on aesthetic objectives. Drinking water should not exceed this level.

Naturally occurring forms of nitrogen can be found as nitrites and nitrates in groundwater. High concentrations of this element can be related to human activities (e.g. excessive fertilizer application, failing septic systems). The Ontario (and Canada) standard for nitrite and nitrate (as nitrogen) is 10 mg/L. Drinking water levels should not exceed this level.

Well types are classified by their depth below ground in metres: Shallow (0-20 m); Intermediate (21-60 m); Deep (>60m).

*Results reflect health at the well and should not replace testing at private wells. Trends for groundwater health will be presented in the 2018 Health Checks (8-10 years of data is required to analyze trends).
Watershed Stewardship is the responsible and sustainable care of our natural resources and wildlife within a watershed. As caretakers of our environment, we need to implement stewardship practices that protect and restore natural resources. (Conservation Ontario)

Almost **96% of land in our watershed is privately owned**. We all depend on good private land stewardship to achieve healthy waters and sustainable ecosystems. To assist landowners in protecting the environment, the NVCA provides a range of technical assistance and grant incentives to help offset the cost of projects on private lands. Grant rates for the various NVCA programs range from 25% to 95% of eligible project costs.

**STEWARDSHIP PROGRAMS**
The NVCA’s stewardship programs encourage landowners to undertake projects that restore our environment and help ensure the future of our healthy waters.

The NVCA’s **Forestry Program** provides trees, planting services and forest management advice for landowners throughout the watershed. Since 2002, landowners in the NVCA watershed have helped plant **1,659,955 trees**, reforesting **727 ha**. More than **250 landowners** have been involved!

The NVCA’s **Healthy Waters Program** provides landowners with technical and financial support for eligible projects, such as water improvement projects and strategic river habitat restoration. Since 2002, landowners in the NVCA watershed have undertaken **899 stewardship projects** on their properties through the support of this program. These projects have stabilized stream banks, improved fish and wildlife habitat, and decreased nutrient runoff – and have kept literally trillions of **E. coli** bacteria from reaching our streams and lakes.

**PUBLIC LANDS MANAGEMENT**
The NVCA’s **Conservation Lands Program** focuses on acquiring lands for the long-term protection of significant natural features and functions. To date the NVCA manages 25 properties totaling **4,877 ha**.

**County Forests** are managed for a variety of environmental, social and economic purposes. There are **119 County forest tracts** (Simcoe, Dufferin, Grey) within the NVCA jurisdiction totaling **9,440 ha**.

**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 16 park areas **(4,382 ha)** within the NVCA jurisdiction.

Many **local municipalities** also acquire and manage lands in the public trust.
Forest, wetland and stream conditions in the NVCA watershed are generally healthy. The Innisfil Creek subwatershed stands out as an area where stream health is poor and forest and wetland conditions are only fair. Stewardship activities, such as enhancing streamside vegetation, are urgently needed to improve stream health in Innisfil Creek – these activities will also benefit downstream water quality in the Nottawasaga River and Georgian Bay. Even our healthiest subwatersheds have degraded areas that can benefit from stewardship activities. Remember that everything flows downstream – what you accomplish on your property ultimately benefits your community and your watershed!

### Key Actions to Improve Habitat & Water Quality:
- Protect and create stream and wetland “buffers” – areas of natural vegetation between the water and adjacent land use practices
- Plant trees along streamside and stabilize eroding stream banks
- Implement agricultural best management practices to reduce nutrient, sediment and bacteria runoff
- Reduce the spread of invasive species and pathogens

### Urban Water Quality & Quantity:
- Conserve water in the home and garden
- Use rain barrels, mulch and rain gardens
- Reduce or stop use of fertilizers
- Don’t pour anything down storm drains – these drains often flow untreated into local water bodies

### Habitat Enhancement:
- Plant native trees, shrubs, wildflowers and grasses to support birds, butterflies and other wildlife
- Learn to identify and remove invasive species

### Protect Your Drinking Water – Well & Septic Care:
- Decommission unused wells to prevent surface contaminants from reaching groundwater
- 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 to 5 years) and avoid using products that kill beneficial bacteria, which aids in the breakdown of septic waste

### Agricultural Best Management Practices:
- Upgrade manure storages and divert clean water from pastures and barn yards 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 use of 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
- Minimize pesticide use wherever possible

### How You Can Make a Difference
- Undertake stewardship projects on your property
- Volunteer at community stream and habitat restoration work days and events
- Participate in citizen science (e.g. amphibian and breeding bird monitoring)
- Donate funds for land conservation or habitat and water improvement projects
- Step into nature – check out our interactive conservation area guide at nvca.on.ca
- Join a local ‘Friends of’ or Field Naturalist group
- Attend community workshops – learn about your local environment
- Manage your forest and receive tax benefits – check out the Managed Forest Tax Incentive Program
- Donate your lands as a living legacy – contact the NVCA to learn more
- Stay informed about upcoming events – check us out on Facebook and Twitter

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2013 Nottawasaga Valley Conservation Authority Watershed Health Check
Our Watershed Ecosystems Benefit Us All

A healthy natural heritage and water resource system is the foundation of a high quality sustainable community. Often these services are overlooked and undervalued. The ecosystem services provided by our lands and waters include:

- healthy agriculture
- clean drinking water
- waste assimilation
- fish and wildlife habitat
- climate stabilization
- flood and erosion control
- forest products
- spiritual and inspirational values
- recreation and ecotourism

Ecosystem services will become even more important as urban growth continues in our watershed communities. This will bring large numbers of new people into our community with expectations for healthy landscapes and streams, clean drinking water and opportunities for recreation.

New growth represents challenges and opportunities for us as a watershed community. Water resources, including stormwater and wastewater, must be carefully managed in urbanizing areas to ensure that the health of our rivers, stream and lakes is protected. Development must be planned to ensure it is safe from flooding and erosion hazards. Interconnected forests, wetlands and streams are needed to maintain water quality as well as the variety of life on our landscape.

Community stewardship will continue to be an important tool to restore subwatershed health. Through innovative planning and wise stewardship, we can sustainably manage our local streams, lakes and natural areas for the benefit of present and future generations.