



AUSABLE BAYFIELD
CONSERVATION

CREATING AWARENESS | TAKING ACTION

Watershed Management Strategy

2015-2025



ACKNOWLEDGEMENTS:

A steering committee made up of nine staff members of the Ausable Bayfield Conservation Authority (ABCA) met regularly between 2013 and 2015 as stewards of this new Watershed Management Strategy (2015).

The steering committee members, at the time of publication, are:

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The staff of the ABCA also contributed input at various stages of the document's development. In-house subject experts also made particular contributions in their areas of expertise. These subject-area contributors included Mari Veliz, Healthy Watersheds Supervisor; Angela Van Niekerk, Wetlands Specialist; Alec Scott, Water and Planning Manager; Davin Heinbuck, Land and Water Technologist; Andrew Bicknell, Regulations Coordinator; Ross Wilson, Water and Stewardship Technologist; and Kate Monk, Manager of Stewardship, Land and Education.

Tom Prout, Past General Manager and Secretary-Treasurer of the ABCA, initiated the project to create a new Watershed Management Strategy (WMS). He worked closely with staff to develop a guiding document outlining the need, audience, and process to create the WMS. He took part in the first meetings of the staff steering committee and ensured the project was moving forward with momentum at the time of his retirement.

Elizabeth Snell, of Snell and Cecile Environmental Research, reviewed a draft of this document, in conjunction with review of some other Ausable Bayfield Conservation documents. She provided meaningful input and the new Watershed Management Strategy is an improved document thanks to her work and insights.

Cite as: Ausable Bayfield Conservation. 2015. Watershed Management Strategy. Ausable Bayfield Conservation Authority. Exeter, Ontario. 33 pp.

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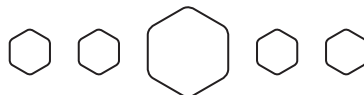


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The PATH Forward

Watershed Management Strategy: **Section One**



1.0 Purpose Statement

The *Watershed Management Strategy* provides direction for the board and staff of Ausable Bayfield Conservation in implementing *The Path Forward: Your Community Conservation Strategy for Ausable Bayfield Watersheds (2012)*.

2.0 Introduction

The Ausable River Conservation Authority was formed in 1946. It was Ontario's first conservation authority. It became Ausable Bayfield Conservation Authority, or ABCA, in 1972.

Representatives of the watershed community developed a Conservation Strategy in 1993. Later, the 1995 Watershed Management Strategy assembled staff input to target the Conservation Strategy's issues, in 36 subwatersheds, as a guide to staff implementation.

Years later, changes both within and beyond the watersheds necessitated updates to the *Conservation Strategy* and the *Watershed Management Strategy*. By 2012, 34 people from the watershed community had taken part to develop *The Path Forward: Your Community Conservation Strategy for Ausable Bayfield Watersheds*. The Watershed Management Strategy (WMS) created in 2015 builds on this document, bringing forward relevant material from the 1995 WMS. Staff members provided input on WMS direction during meetings between 2013 and 2015. A staff steering committee met regularly to determine direction, develop the document, and incorporate input from staff and directors. An external consultant with environmental writing and strategic planning expertise reviewed the document and her comments were considered in revisions to this document. The Board of Directors of ABCA approved the new Watershed Management Strategy on May 21, 2015.

The new *Watershed Management Strategy* will help ensure we are moving forward together, with a clear direction and understanding of what we need to do. For maximum flexibility, specific actions are left to staff expertise in the context of specific situations and detailed information. Although intended mainly for Ausable Bayfield Conservation Authority staff, the WMS will also provide valuable information and strategies to partners.

The Conservation Strategy built a mission, vision, and goal for Ausable Bayfield Conservation:

Mission: Protect, improve, conserve and restore the watershed in partnership with the community.

Vision: Healthy watersheds where our needs and the needs of the natural environment are in balance.

Goal: Working with you, to create awareness and take action to improve watersheds for healthier communities and healthier people.



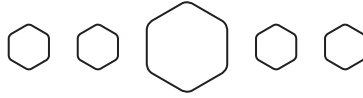
Mission: *Protect, improve, conserve and restore the watershed in partnership with the community.*



Vision: *Healthy watersheds where our needs and the needs of the natural environment are in balance.*



Goal: *Working with you, to create awareness and take action to improve watersheds for healthier communities and healthier people.*



Watershed Community Concept:

The community team that developed *The Path Forward* conservation strategy created a circle diagram of how the conservation authority and the community can work together to build healthy watersheds. This concept can help to guide the Watershed Management Strategy (Figure 1).

Historically, Ausable Bayfield Conservation has adapted to its changing environment. To continue as a leader, the conservation authority recognizes it needs to continue to adapt.

The following are some of the actions the local agency will need to undertake in the future:

- Facilitate and support ongoing community-based monitoring programs. The more the community can be involved in the studies, the better their understanding of environmental information becomes. It is important for the community to have this information to help guide better management.
- Continue to develop and improve the Watershed Information System Kisters (WISKI) data management system to improve forecasting of flooding events, provide continuity for storage of historic data, and provide a means to publicly share watershed monitoring data.
- Provide local, solid, practical knowledge and assistance to the community, including landowners and organizations, to enable them to be good stewards of soil, water, and natural heritage.
- Improve watershed health through stewardship of ABCA land holdings and strategic property acquisition in sensitive areas.
- Continue to protect, promote, and improve outdoor recreation areas to balance recreation needs and the needs of the natural environment and showcase stewardship practices.
- Continue to provide a diversity of program delivery options and provide extensions to connect youth with nature and protect, improve, conserve and restore the watershed.
- Continue to evolve to respond to changing development pressures.
- Continue to monitor hazard processes and respond to new challenges such as the impacts of climate change.



Figure 1. Conservation Strategy concept of how to create healthier watersheds.



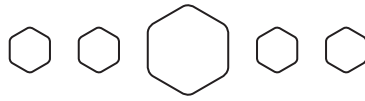


Figure 2. Map of Ausable Bayfield Conservation Authority (ABCA) jurisdiction.

3.0 The PATH

The community’s Conservation Strategy is called *The Path Forward*. To move along the PATH (**P**artnerships, **A**wareness and **A**ction, **R**educing **T**hreats, **H**ealth) forward, to where the community has asked Ausable Bayfield Conservation to go, the conservation authority’s direction and actions will need to aspire to the WMS goals derived from the Conservation Strategy with accompanying objectives:

3.1 Watershed Management Strategy Goals and Objectives

The goal of the Conservation Strategy, from the community’s document, is phrased this way: “We want to work with you to create awareness and take action to improve watersheds for healthier communities and healthier people.”

The WMS will implement this statement using the following **Watershed Management Strategy Goals**:

1. To preserve, protect, enhance and restore the ecological function of the Ausable Bayfield watersheds.
2. To contribute to community health, safety, and sustainability.
3. To build partnerships, awareness, and engagement at all levels.

Four objectives of the Watershed Management Strategy represent the PATH needed to move forward to reach the ultimate goal of a healthy watershed where our needs and the needs of the natural environment are in balance (*Figure 3*). These objectives are to:

1. Engage **P**eople: Build community partnerships and engagement at all levels.
2. Create **A**wareness and Take **A**ction: Employ effective education, research, monitoring and evaluation to contribute to community health, safety and sustainability.
3. Reduce **T**hreats: Protect life and property by reducing threats.
4. Enhance **H**ealth/Resilience: Preserve, protect, enhance, the ecological integrity of the Ausable Bayfield watersheds.



Figure 3. Following the PATH can inform the progress of implementing the Conservation Strategy.

3.2 Navigating the PATH

Society is changing and the business of Ausable Bayfield Conservation continues to evolve. The ways staff members carry out the recommendations of this Watershed Management Strategy need to evolve as well.

Each individual leg of the PATH or objective has guiding principles or philosophies that will help set the course for recommended actions. As society and the world around us changes our actions may have to change but the principles remain the same.

3.2.1 Engage People

To engage people, we need to include principles such as:

- Go to where people are, rather than simply inviting them to come where we are.
- Be positive and share an inspiring mission and vision.
- Listen to the ideas of others.
- Make activities meaningful and enjoyable.

3.2.2 Create Awareness and Take Action

Key principles of awareness include:

- Humans are dependent on, and a part of, nature.
- Understanding of our watershed's interconnections.
- Empowerment of others to make a difference in one's community.

3.2.3 Reduce Threats

To reduce threats we are guided by the principles:

- Threats have a spatial extent and ecosystem breadth.
- Use of science-based methods to mimic nature, where possible.

3.2.4 Enhance Health/Resilience

Principles include:

- Protect and preserve what is most valuable.
- Enhance what is feasible to offer a high potential for improving watershed health and resilience.
- Restore low ecologically functioning areas to act closer to natural forms.



4.0 Recommended Actions along the PATH

Recommended actions for Ausable Bayfield Conservation as a whole, or groups within the watershed, fulfill the PATH objectives (**P**artnerships, **A**wareness, **T**hreat Reduction, **H**ealth). A recommendation that applies to more than one PATH objective is listed with the most applicable one but may apply to several. All recommendations are subject to financial and human resource constraints.

4.1 General Recommendations

Ausable Bayfield Conservation should:

1. Build and maintain **partnerships** with landowners, community groups, municipalities and agencies for both short-term and long-term projects by:
 - a) Departments maintaining up-to-date list of existing and potential partners and collaborations that have an overlapping objective or objectives with WMS.
 - b) Coordinating to ensure compatible, non-duplicative programs.
2. Raise **awareness** of the Ausable Bayfield Conservation programs and vision by:
 - a) Encouraging preparation and use of subwatershed and community watershed plans, explaining issues as they relate to residents.
 - b) Reviewing policies and programs of other levels of government which affect Ausable Bayfield Conservation watershed health, and informing them of any concerns.
3. Support programs such as Carbon Footprints to Forests as a means to counterbalance the **threats** caused by emission of carbon dioxide and other greenhouse gases and adapt to, and mitigate, climate change and to build watershed resiliency to deal with weather variability.
4. Implement the WMS process by:
 - a) Understanding and applying the concept of Design, Collect, Store, Analyze, and Report their project or program activities.
 - b) Staff setting Specific Measurable Assignable Realistic Time-Related (SMART) targets for the improvement of the watershed.
 - c) Setting an evaluation component and review schedule at project inception and applying to all programs and the WMS, with reviews including target progress and new issues and techniques – including those learned from meeting with other CAs – followed by appropriate program adjustments. WMS is to be reviewed every 10 years.
 - d) Sharing resources and information among staff, including full use of the GIS as a tool to manage and analyse data.



4.2 Corporate Services Recommendations

Ausable Bayfield Conservation should:

5. Raise **awareness** of conservation measures by maintaining a Green Team to reduce waste and energy use in Ausable Bayfield Conservation Authority facilities and practices.
6. Implement the WMS process by:
 - a) Creating and regularly updating a Digital Information Management and Technology Strategy that includes: working with agencies to develop mapping and data standards suitable for current and future analyses; maintaining an Internal Mapping Site (IMS) that gives all staff access to GIS information; participating in programs and partnerships that allow for IT/GIS software and hardware infrastructure cost savings.
 - b) Maintaining an updated communications plan for Ausable Bayfield Conservation Authority.
 - c) Encouraging staff to stay current in science and technology through training and professional development.
 - d) Maintaining and expanding Ausable Bayfield Conservation catalogue of reference material including but not limited to reports, digital data, and books.
 - e) Promoting and supporting programs and projects of the Ausable Bayfield Conservation Foundation and Huron Tract Land Trust Conservancy.

4.3 Conservation Education Recommendations

Ausable Bayfield Conservation should:

7. Seek **partnerships** to subsidize the cost of the Ausable Bayfield Conservation education program for local schools.
8. Create **awareness** by:
 - a) Supporting curriculum-based conservation education.
 - b) Promoting the highly effective overnight conservation education program at Camp Sylvan to local schools.
 - c) Delivering watershed-based messaging, as education staff working with other Ausable Bayfield Conservation staff, through as many Ausable Bayfield Conservation projects and activities as possible.
 - d) Providing environmental education for local schools, community-based organizations and businesses through effective program delivery, presentations and special events.



4.4 Drinking Water Source Protection Recommendations

Ausable Bayfield Conservation should:

9. **Partner** with municipalities to reduce **threats** to drinking water sources through efforts including stewardship best practices and effective risk management.
10. Increase **awareness** of methods to protect drinking water sources by:
 - a) Widely publicizing household hazardous waste days and opportunities to safely and properly dispose of waste in support of the protection of sources of drinking water.
 - b) Providing education and outreach in support of actions that reduce risk to sources of drinking water.

4.5 Environmental Monitoring Recommendations

Ausable Bayfield Conservation should:

11. Encourage citizen and other **partner** participation in monitoring watershed resources, including water, soil, and living things such as species at risk; follow-up participation in protecting and improving the resources; and in acquisition of high-quality air photos for the entire watershed on a five-year cycle.
12. Improve **awareness** with regular Watershed Report Cards and other evaluation tools.
13. Contribute to evaluation of **threats** to watershed health by:
 - a) With partner agencies, conducting long-term watercourse monitoring of fisheries, habitat, temperature and for at least one channel cross-section – morphology, to inform protection, management, enhancement, and restoration of aquatic habitat.
 - b) Updating and expanding the Water Quality Network Design report to provide the foundation for watershed monitoring.
 - c) Seeking partnerships to monitor sinkholes for changes in local groundwater quality and in surface runoff entering the sinkholes.
 - d) Determining water quality trends, through time and at key stations, from ongoing monitoring data.
 - e) Being aware of gravel extraction and impacts on watershed ecology and, when appropriate, providing advisory comments to reviewing agencies.
14. Improve watershed **health** by:
 - a) Creating and implementing a guideline document for monitoring of the physical changes to the Lake Huron shoreline. Methods will include aerial photography, water levels changes, and physical surveys.
 - b) Develop an approach that determines where subwatershed plans are best initiated (for example, areas of protection and areas of enhancement.)
 - c) Regularly review and update the inventory of locally Environmentally Significant Areas (ESAs).



4.6 Flood Plain Management Recommendations

Ausable Bayfield Conservation should:

15. **Partner** with municipalities and agencies to alleviate flood and drought **threats** by:
- a) Maintaining, advancing, and promoting an effective flood forecasting system to protect people from flood hazards.
 - b) Monitoring and maintaining Ausable Bayfield Conservation Authority flood and erosion control structures that protect existing development from flooding and erosion.
 - c) Maintaining and expanding water quantity monitoring networks to provide information that supports flood forecasting and warning, the Ontario Drought Program, and other water management programs.
 - d) Encouraging municipalities to maintain appropriate Emergency Contingency Plans dealing with floods.
 - e) Assisting municipalities to identify areas prone to floods or other water-related hazards and to implement appropriate measures to protect new development.
 - f) Participating in the Ontario Drought Program and working with the Low Water Response Team and other agencies, such as Ontario Ministry of Natural Resources and Forestry (OMNRF) and Ontario Ministry of the Environment and Climate Change (MOECC), to address concerns of low base flow.



4.7 Planning and Regulations Recommendations

Ausable Bayfield Conservation should:

16. Improve **awareness** of low-impact design by working with and educating municipalities; and drainage engineers and superintendents on designs that improve water quality, quantity and habitat and naturalize channels.
17. Alleviate **threats** from hazard lands by:
 - a) Continuing to make use of regulations to discourage development in natural hazard areas.
 - b) Encouraging proper management of urban and rural stormwater runoff.
 - c) Working with municipalities and watershed partners to encourage the identification and protection of natural hazard areas in such documents as official plans and zoning bylaws.
 - d) Maintaining GIS layers of all hazards to help inform the watershed community of areas that are regulated under the Conservation Authorities Act.
 - e) Identifying areas of significant erosion and flooding to provide technical assistance to protecting development from them, through the Planning and Regulations Programs.
 - f) Regularly reviewing and updating policies, procedures and technical guidelines for: natural heritage, hazard lands and stormwater management to keep current with state of the science and the needs of a changing landscape and climate.
18. Enhance the **health** of the watershed by:
 - a) Land use planning, zoning changes, regulations policy, and comments: promoting establishment of permanently vegetated riparian buffers, using natural species, along riparian zones.
 - b) Regularly reviewing and updating the shoreline recession rates and the Shoreline Management Plan to insure that its implementation policies address any changes in provincial or authority policy or emerging land use trends.
 - c) Identifying target areas where municipal drainage projects could benefit from alternative drain maintenance or construction techniques.
 - d) Protecting and enhancing natural channels and associated riparian features as the primary objective of riverine management. In altered or managed channels such as municipal drains, opportunities to enhance the natural channel features and adjacent land use should be explored.
 - e) Increasing and formalizing the use of subwatershed planning concepts as a means to implement land use planning.





4.8 Private Land Stewardship Recommendations

Ausable Bayfield Conservation should:

19. Encourage citizen and **partner** participation by:

- a) Evaluating the current model of education and voluntary stewardship and exploring new tools and collaborations that expand conservation opportunities.
- b) Supporting counties, municipalities and agencies in development, delivery, and review of forest conservation bylaws.
- c) Working with the community, all levels of government, and non-governmental organizations to encourage use of best management practices.
- d) Cooperating with landowners to improve and protect watershed resources by encouraging financial incentive programs; providing education; offering technical assistance; and helping landowners to find out about and obtain financial incentives for their stewardship projects and best management practices.
- e) Pre-consulting with drainage superintendents when designing vegetative buffer strips along municipal drains in order that trees are not located where they may interfere with long-term drain maintenance.
- f) With partners, exploring new tools to augment voluntary stewardship and outreach to help increase conservation ethic and land stewardship opportunities.

20. Raise **awareness** of how to alleviate **threats** to the watershed ecosystem by:

- a) Encouraging and evaluating effectiveness of best management practices that promote the slow release of stormwater to watercourses. Watershed management should consider options of avoiding, controlling, trapping stormwater runoff and treating water, sediment and associated nutrients.
- b) Encouraging proper livestock waste management and restricted livestock access to streams.
- c) Educating agencies and agricultural producers about environmentally sound nutrient and manure management and best management practices and to continue to assist in implementation.
- d) Providing information to landowners about proper septic system maintenance; encouraging repair or replacement of faulty septic systems; and supporting the work of municipalities and public health units to educate landowners, conduct septic system inspections and enforce applicable legislation.

21. Enhance the **health** of the watershed by:

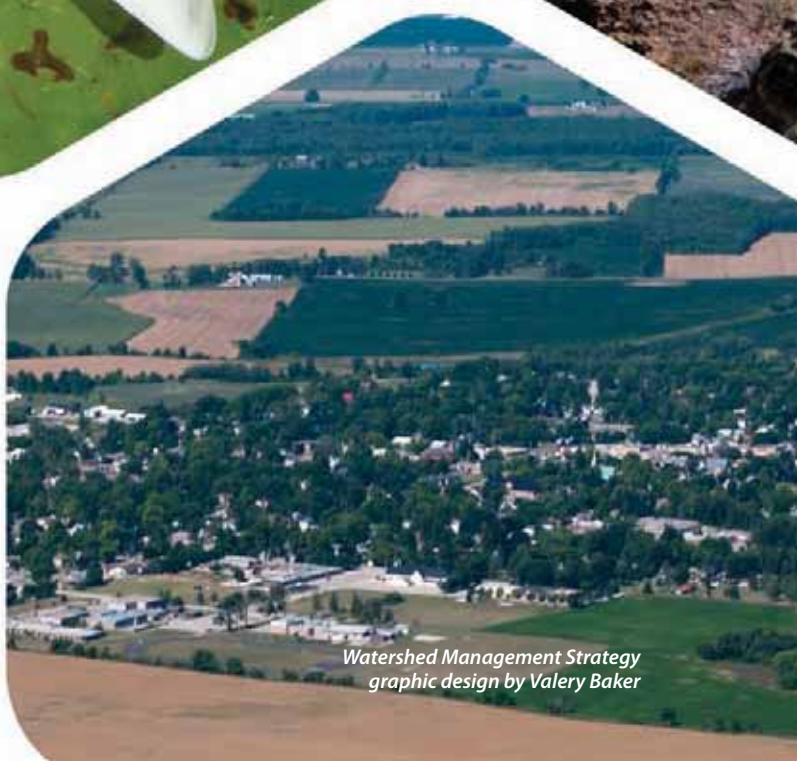
- a) Assisting farmers to maintain healthy, resilient soils that can sustain ongoing agricultural production while minimizing nutrient and topsoil losses to surface waters, groundwater, or air.
- b) Encouraging establishment of permanent vegetative cover through cover crops and naturalization and/or active restoration of fragile lands, slopes, marginal lands, and other sites of ecological value, with diverse native species.
- c) Promoting planting and maintenance of vegetative buffers along watercourses, wetlands, and valleylands using a combination of trees, shrubs, and native non-woody meadow and prairie vegetation. Buffer widths should meet or exceed the minimum requirements defined by legislation.
- d) Encouraging windbreak, roadside, and hedgerow plantings throughout the watershed, using several vegetation species and forms.

4.9 Property Management Recommendations

Ausable Bayfield Conservation should:

22. Engage **people** by providing opportunities for outdoor recreation.
23. Raise **awareness** of and encourage ecologically-sound land management practices by:
 - a) Using conservation authority forests to demonstrate proper woodlot management techniques that conserve natural heritage values while providing for income.
 - b) Using conservation authority lands to demonstrate techniques to manage invasive species, restore soil hydrology, and associated native plant and animal communities.
24. Alleviate **threats** to the watershed ecosystem by being aware of invasive plant species on Ausable Bayfield Conservation Authority properties and controlling the species as much as possible.
25. Enhance **health** of the watershed ecosystem by:
 - a) Conducting regular inventories of species at risk on Ausable Bayfield Conservation Authority properties and using available stewardship incentives and technical advice to protect, conserve and enhance their habitat.
 - b) Regularly updating the land securement plan and, as resources permit, strategically acquiring and maintaining conservation lands.
 - c) Considering the role and possible need of natural disturbances (e.g., fire, flood, windthrows) in natural ecosystem maintenance.
 - d) Reviewing Master Plans of Ausable Bayfield Conservation Authority properties to ensure they are compatible with the Watershed Management Strategy.



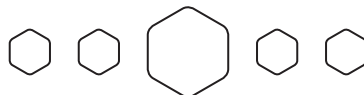




The PATH Travelled

Watershed Management Strategy: Section Two

(Watersheds, History, Context, Challenges, and Accomplishments)



5.0 Ausable Bayfield Conservation Watersheds

Ausable Bayfield Conservation Authority's land area is 2,428 square kilometres, bordering Lake Huron (Figure 4). The population is about 45,000. For more facts see the most current *Watershed Report Card* online at abca.on.ca.

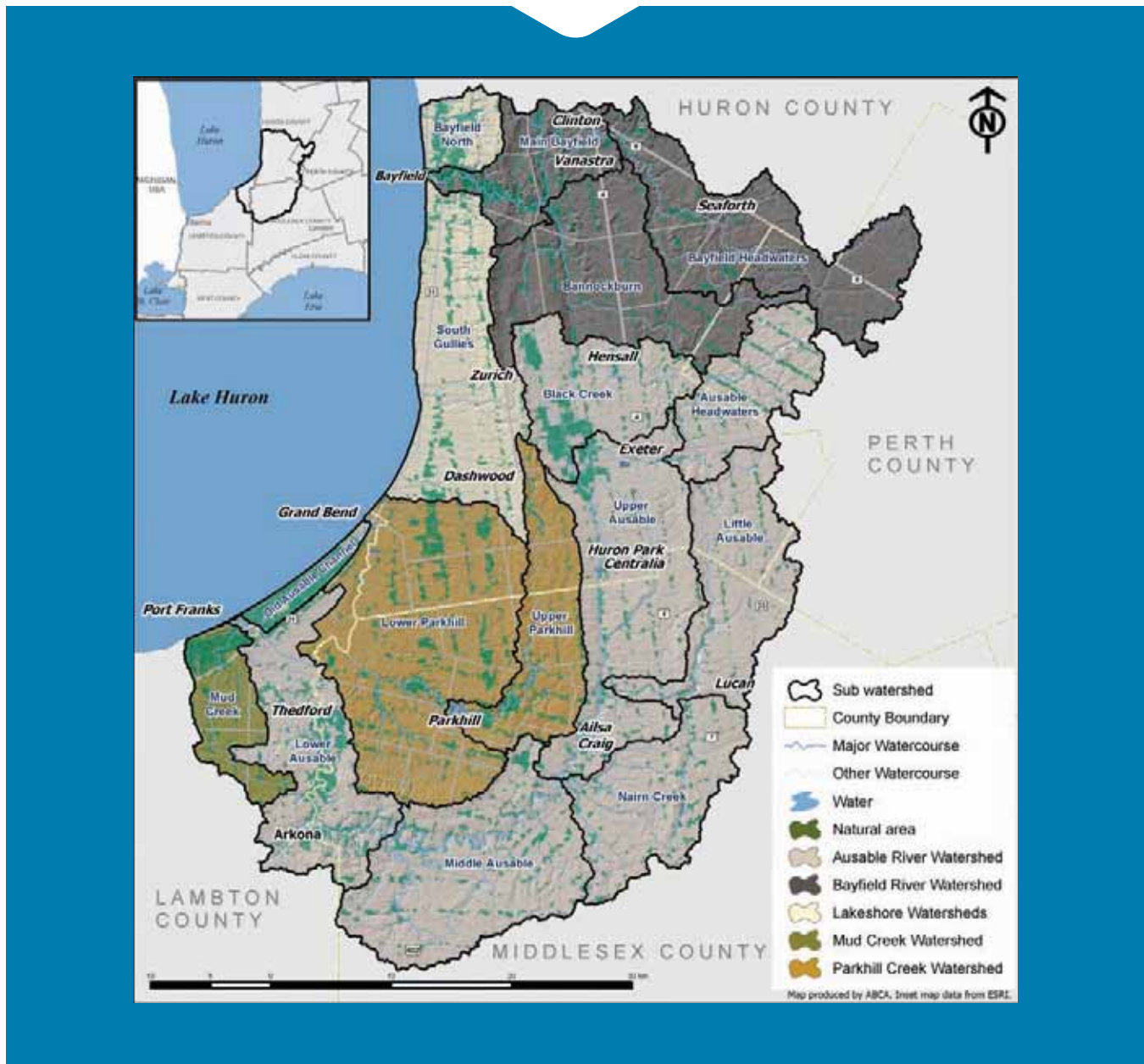


Figure 4. Subwatersheds and natural areas of the Ausable Bayfield Conservation Authority (ABCA).

It is a largely rural watershed and fertile agricultural area with high livestock density. The watershed area has limited upstream natural areas and much artificial drainage.

The area has some forested river gorges and highly significant dune ecosystem. Most of the watersheds have clay to silt/clay till plains with poor infiltration.

Wetland areas are limited in Ausable Bayfield watersheds.

5.1 Watershed Descriptions – Major Watersheds

The following outlines cover only major features. For detailed information about the watersheds, please see the most recent *Ausable Bayfield Watershed Report Card*.

5.1.1 Ausable River Watershed

The Ausable River basin is about 1,189 square kilometres in area.

The Ausable River starts near Staffa and flows lakeward until blocked by the Wyoming Moraine west of Exeter. There it turns southward along the moraine to Ailsa Craig where it manages to cut across the moraine in a wide arc westward to enter Lake Huron at Port Franks.

The Ausable River Watershed includes the Ausable River, Mud Creek, and Old Ausable Channel (Dunes) watersheds. Bedrock aquifers tend to be protected by deep overburden deposits while shallow aquifers are more susceptible to contamination. Sinkholes and Karst topography are found in headwater areas. The area's stream-feeding shallow aquifers are vulnerable to contamination from surface water.

Hay Swamp is the only major remaining natural wetland filtration area in the Ausable River Watershed.

Runoff can collect bacteria and nutrients from nearby fields and properties.

The forest in the Ausable Gorge helps prevent erosion.

The fragile dune network of the Old Ausable Channel, beyond Highway 21, contains much of the last Old Savanna woodland in North America.

There are few cold-water streams in the watershed. The only cold-water streams are in the headwaters of Black Creek and Nairn Creek.

The Ausable River supports one of the most diverse and unique assemblages of aquatic fauna for a watershed of its size in Canada. At least 26 species of freshwater mussels and 85 species of fish have been documented¹. Some of these species are rare and have been assessed federally and provincially as Endangered, Threatened, or Special Concern. The Ausable River also supports other rare semi-aquatic species such as turtles and snakes.

The Ausable River Watershed does not have as much wildlife as it did prior to more intensive use of land. The Thedford-Klondyke Marsh was drained many years ago but it is still a stopping point for tundra swans and other migratory waterfowl in early spring. Populations of some wildlife species co-exist with human settlement.



Ausable River



Mud Creek



Old Ausable Channel

¹ Fisheries and Oceans Canada. 2014. Action Plan for the Ausable River in Canada: An Ecosystem Approach [Draft]. *Species at Risk Act* Action Plan Series. Fisheries and Oceans Canada, Ottawa.

5.1.2 Old Ausable Channel

The Old Ausable Channel (OAC) is an isolated portion of the Ausable River. This historic channel was cut off from the present Ausable River in the 1890s. No longer part of a flowing river the groundwater-fed channel is characterized by clear water and dense aquatic vegetation.

5.1.3 Parkhill Creek

The Parkhill Creek Basin covers about 461 square kilometres of area. Parkhill Creek starts near Dashwood and flows southward, adjacent to the moraine, and then westward towards Parkhill. The creek was a tributary of the Ausable River at one time but it now empties into Lake Huron at Grand Bend through a short channel constructed in 1892.

5.1.4 Mud Creek

Mud Creek Basin is about 69 square kilometres in area, located in Lambton Shores. The creek flows north to empty into Lake Huron at Port Franks. The lower watershed includes significant oxbow wetlands (L Lake and Old Mouth Lake).

5.1.5 Bayfield River Watershed

The Bayfield River Basin is about 499 square kilometres in area. It extends from north of Dublin and flows lakeward to outlet in Lake Huron at Bayfield. Bannockburn River and Trick's Creek are two tributaries that contain some of the best cold-water habitat in the watershed. Trick's Creek and Bannockburn River gain water from shallow aquifers that raise the water quality of the Bayfield River, and support a trout population (resident and migratory species).

The upper watershed has little natural vegetation to filter contaminants from rain and snowmelt runoff. Clay soil accelerates runoff flow. Downstream of Clinton, most stream banks are forested, and the wetland near Trick's Creek filters contaminants.

The lower Bayfield River Valley Gorge supports a large, rich forest – a valuable legacy of pre-settlement ecosystems. At least 16 species of freshwater mussels² and 35 species of fish³ have been documented in the Bayfield River. Some of these species are rare and have been assessed federally and provincially as Endangered, Threatened, or Special Concern. In addition, the Bayfield River supports other rare semi-aquatic species such as turtles and snakes.

5.1.6 Lakeshore Watersheds

Close to 70 small watersheds empty directly into Lake Huron between Grand Bend and the boundary with the Maitland Valley Conservation Authority (MVCA) jurisdiction.

² Morris T.J., McNichols-O'Rourke, K.A. and Robinson, A. 2012. A preliminary survey of the freshwater mussels of the Bayfield River Watershed and Nearby Lake Huron Tributaries. Can. Manuscr. Rep. Fish. Aquat. Sci. 2993: v +26 p.

³ Veliz, M. 2001. Fish Habitat Management Plan. Ausable Bayfield Conservation Authority. Exeter, Ontario. 86 pp.



6.0 Changing Landscapes – Historic Context to Current Context to Future Path

The philosopher Heraclitus of Ephesus said “everything changes and nothing stands still” and “ever-newer waters flow on those who step into the same rivers.” Nothing stays the same except change.

Physical landscapes change. Economic, social, political, historical, technological, and scientific landscapes change as well.

A strategy, while helping to direct change, must also be flexible to adapt to the inevitable changes.

6.1 Where we have come from

6.1.1 Watershed Origins

Forest cover and natural area rapidly declined after 1850 as settlers cleared woodlands for agriculture and roads, using timber for fuel wood, fencing and building materials.

By the early 1900s, forest cover in the Ausable River watershed had shrunk to below 10 per cent of the area.⁴

Prior to European settlement, the Ausable River flowed north to Grand Bend where it turned abruptly (Grand Bend derived its name from the hair-pin turn in the river) to continue southward through the dunes to Port Franks. Issues of flooding prompted excavation of the Ausable River Cut between 1873 and 1875, to allow drainage and settlement of wet land in this area. The Cut permitted the Ausable River to flow directly to the lake, leaving only Parkhill Creek contributing to the original river bed of the lower portion of the Ausable River. In 1892, a second channel at Grand Bend diverted Parkhill Creek flow straight to the lake, severing it from the channel through the dunes.⁵ See maps on page 22.

⁴ Luinstra, B., Snell, E., Steele, R., Walker, M. and Veliz, M. 2008. Watershed Characterization. Ausable Bayfield Maitland Valley Source Protection Region. Exeter. 99 pp.

⁵ Richardson, A.H. 1949. Ausable Valley Conservation Report 1949. Ontario Department of Planning and Development, Conservation Branch. Toronto. 73 pp.



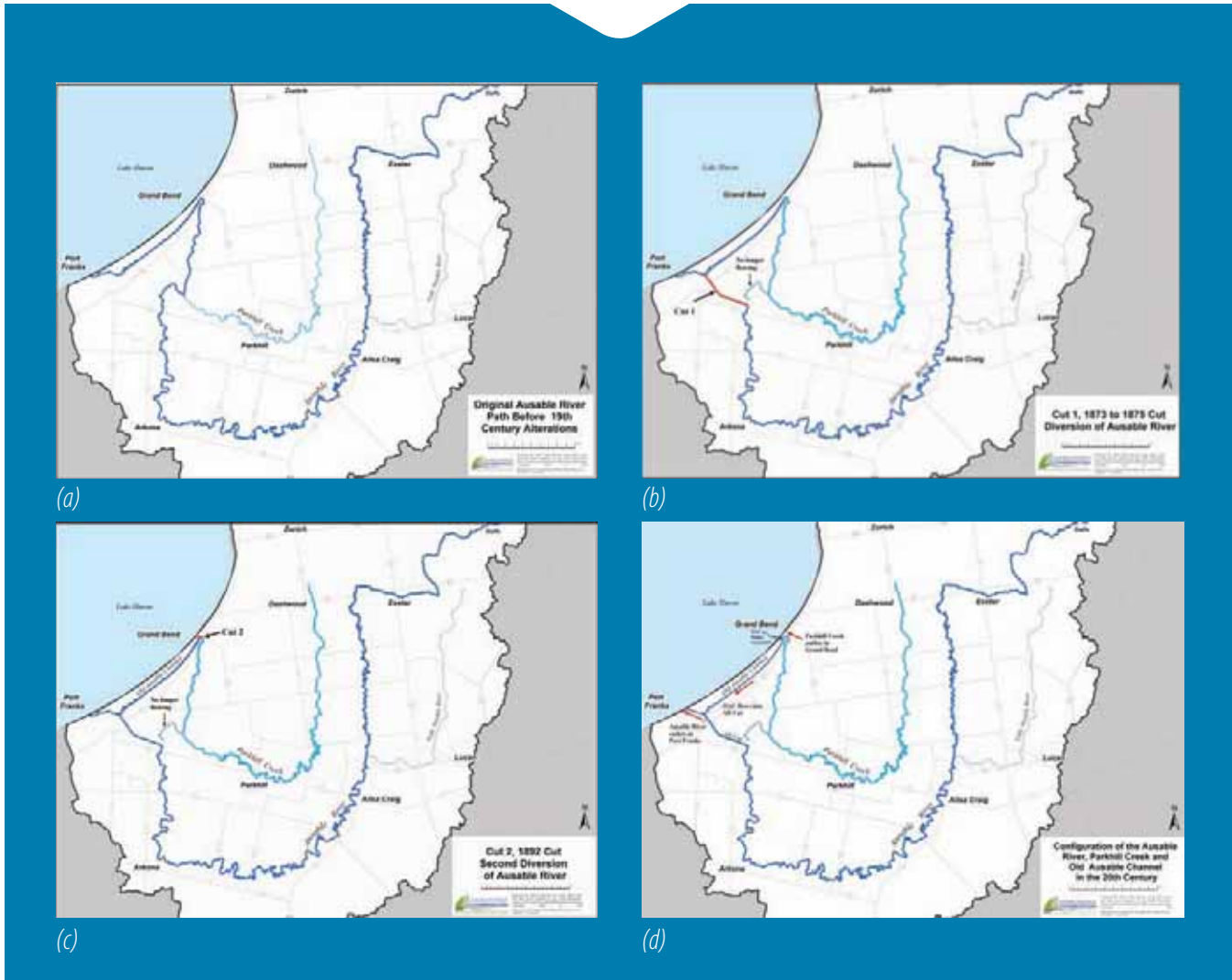
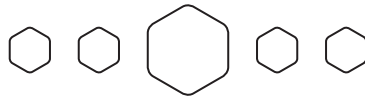


Figure 5. Ausable River flow path alterations in the late 1800s. (a) Original Ausable River path before 19th century alterations; (b) Cut 1: 1873 to 1875 cut diversion of Ausable River; (c) Cut 2: 1892 second cut diversion of Ausable River; (d) Configuration of the Ausable River, Parkhill Creek, and Old Ausable Channel in the 20th century.

During the 20th century, there was a slight increase of forest area in some of the more marginal lands. Large habitat losses, however occurred with the draining of the Thedford-Klondyke Marsh. After World War II, farms gradually became more mechanized, larger and less diverse. Cattle number grew and feed lots replaced pastures. Pastured woodlots are now rare but left a legacy of impoverished ground flora in many forest areas.

Air photographs (Figure 6) and land use statistics (Figure 7) illustrate some of agriculture's evolving landscape. *Notes: Changes in field sizes and cropping typical in the watershed area shown has rolling topography*

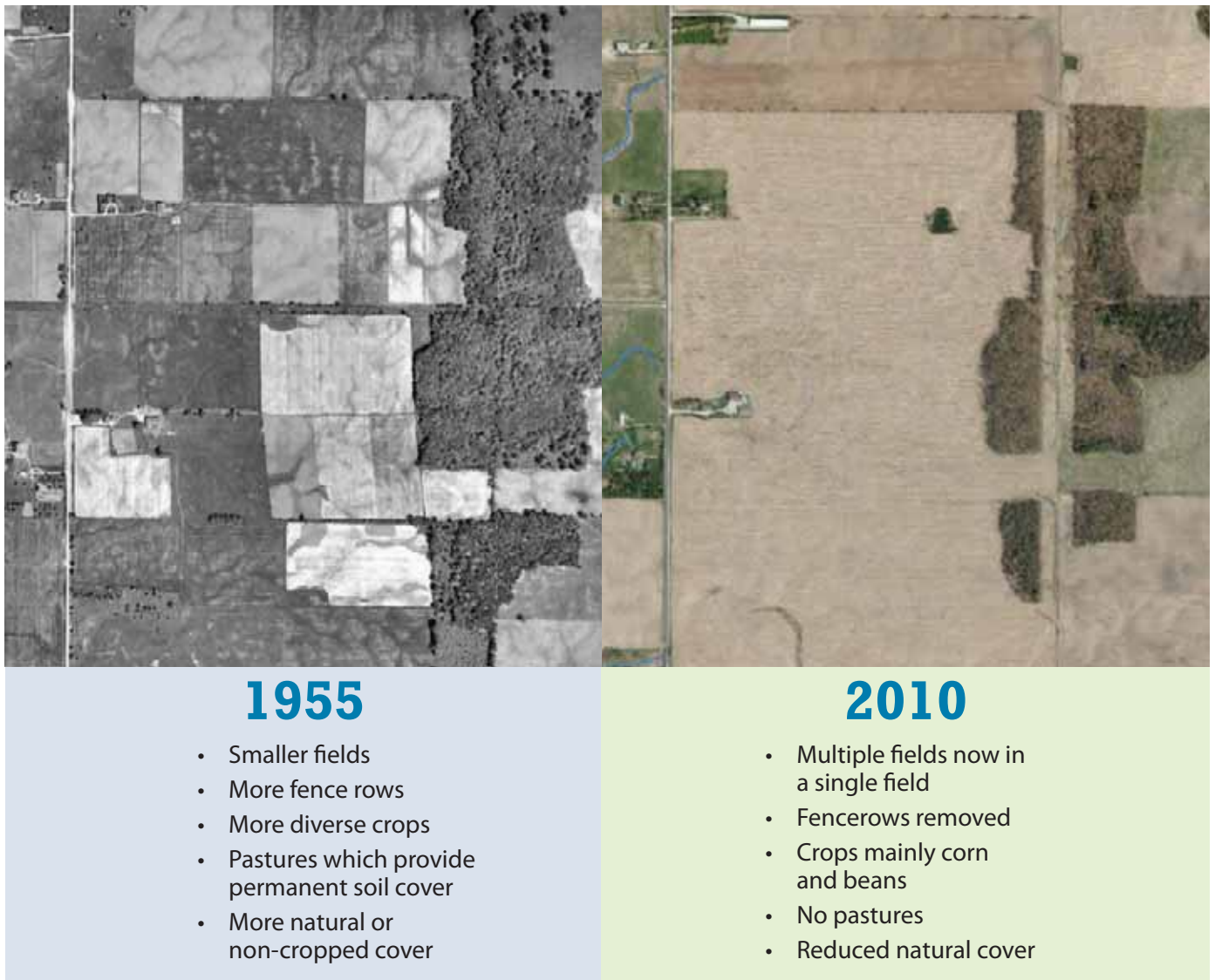
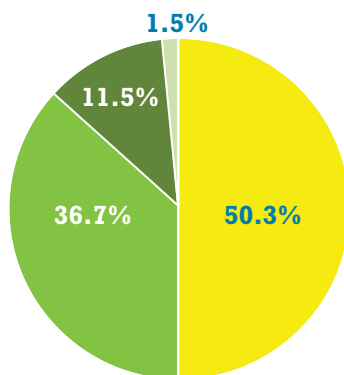


Figure 6. Air photos of the same location within the Ausable Bayfield Conservation Authority watershed in 1955 and 2010.

1949 Land Use in the Ausable Watershed



2010 Land Use in the Ausable Watershed

- Cultivated Land
- Pastured
- Wooded
- Non-agricultural

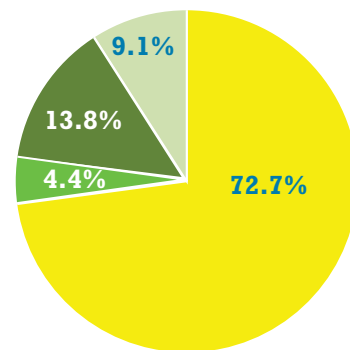


Figure 7. Percentage land use in the Ausable Watershed in 1949 and 2010.

Chairman - W.A. Sutherland
Vice-Chairman - Victor Fuller
Secretary-Treasurer - Oliver Amos
Chief Officer - A.H. Richardson



EXETER, ONTARIO
Telephone 235-2610

AUSABLE RIVER CONSERVATION AUTHORITY

6.1.2 History

Almost seven decades prior to the 2015 Watershed Management Strategy, local municipal councils of the day identified issues that went beyond the borders of towns or townships.

Minutes of the McGillivray Township Council in 1946 record that: "It is the belief of this council that the ruthless ploughing of flooded grassland together with the uncontrolled cutting of timber is creating a condition which is beyond the power of this and other municipal councils to control. Therefore this council requests the minister to have a survey made of the Ausable River Watershed to determine the conservation measures necessary to ensure proper land use of this area."⁶

The need to create strategies to maintain wetlands and forest cover, provide flood forecasting and warning, and protect life and property, led to the creation of the Ausable River Conservation Authority (later the Ausable Bayfield Conservation Authority or ABCA).

1940s

The Ausable River Conservation Authority, Ontario's first, was formed in 1946 to deal with local flooding, soil erosion, and to protect the quality and supply of water.

The Ontario Department of Planning and Development created the Conservation Report for Ausable River watersheds in 1949.



1950s

By the start of the decade, the conservation authority had more than 300 acres of conservation lands under its protection. It subsequently completed projects that included flood control, erosion control strategic purchase of land, the Farm Pond Assistance Program; clean-up and tree planting at Hay Swamp; construction of Morrison Dam near Exeter by 1959; and the purchase of the land which would make up Rock Glen Conservation Area near Arkona and Ausable River Cut Conservation Area in Port Franks.

It was conservation authority vision and land acquisition south of Grand Bend that would be continued by the Province of Ontario to become Pinery Provincial Park. This natural area contains much of the remaining Oak Savanna woodland to be found in North America.

1960s

The conservation authority constructed Parkhill Dam and began many conservation education projects including the Sylvan Conservation Education Program at Scouts Canada's Camp Sylvan property. Other conservation authority work during this decade included conservation area maintenance and operation (Rock Glen, Thedford, Morrison Dam, and Lucan), tree planting, and erosion control, among other programs.



Photo of Sylvan Conservation Education Program courtesy of The Exeter Times-Advocate (July 2, 1964)

⁶ Dixon, A. 1986. The Ausable Bayfield Conservation Authority: An Old Man's View. 40 Years of Conservation. Ausable Bayfield Conservation Authority.



AUSABLE BAYFIELD CONSERVATION AUTHORITY

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Our Member Municipalities:

*Adelaide Twp
Ailsa Craig
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Bayfield
Bosanquet
Clinton
East Williams
Exeter
Goderich Twp
Grand Bend
Hay Twp
Hensall
Hullett Twp
Lucan Biddulph Twp
McGillivray Twp
McKillop Twp
Middlesex Centre
Parkhill
Perth South Twp
Seaforth
Stanley Twp
Stephen Twp
Thedford
Tuckersmith Twp
Usborne Twp
Warwick Twp
West Perth Twp
West Williams Twp
Zurich*

1970s

The conservation authority continued to secure land to ensure the ecological benefits of nature areas. The 90-acre Mystery Falls woodland in the Ausable Gorge was one of those properties. The local agency also completed projects to control flooding and erosion.

The Bayfield River Watershed's first report was created in 1971. The Bayfield Watershed was added to the local organization's area in 1972 and the agency became the Ausable Bayfield Conservation Authority or ABCA.

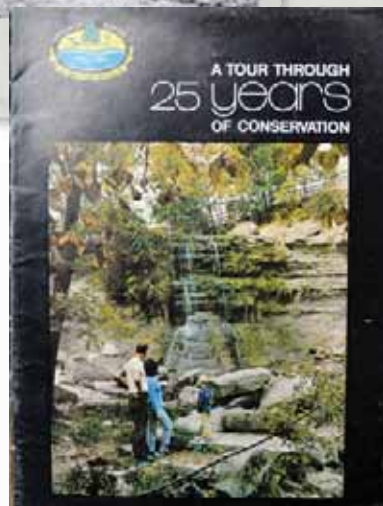
The Ausable Bayfield Conservation Foundation was created in 1974.

In 1974 the Ausable Bayfield Conservation Authority started its Private Land Tree Planting Program, then called the Farm Tree Replacement Program.

The ABCA supplied trees for windbreaks. In 1978, 40,000 trees were planted on private land and 120,000 trees planted on conservation authority lands.

Bannockburn Wildlife Area (now Bannockburn Conservation Area) was opened to the public. The conservation authority added washrooms, gatehouse, picnic pavilion, and playground to Rock Glen Conservation Area.

A number of erosion control projects were completed in the Grand Bend area.



A MEMBER OF THE CONSERVATION ONTARIO NETWORK





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1980s

More erosion control projects were completed in Clinton, Port Franks, Grand Bend and Nairn.

Ausable Bayfield Conservation Authority employed its first general manager in 1981 and first full-time professional engineer in 1982.

The new administration centre at Morrison Dam Conservation Area was constructed in 1983.

The Arkona Lions Museum and Information Centre was constructed in 1985 and officially opened in 1986.

New Conservation Area Master Plans and Ausable Bayfield Conservation Authority Watershed Plan were created. ABCA's Fill, Construction and Alteration to Waterways Regulation (Ontario Regulation 544/84) was enacted. The conservation authority had a \$1 million annual budget for the first time. The province was the major funding source.

The Ausable Bayfield Conservation Authority conducted groundbreaking water quality research regarding liquid manure application impacts on tile drains and receiving watercourses. Research also documented the distance that pollutants could travel in the watershed.

Work during those years included the Seaforth Flood Plain Management Study; a flood plain administrative study in Port Franks; a Dublin flood line delineation study; a Trick's Creek trout habitat and stream rehabilitation project; a Zurich Drain flood plain delineation and stormwater management study; a farm waste management study; Thedford dune grass plantings; several erosion control projects; and more.

New foot bridges were built at Bannockburn Wildlife Area and Morrison Dam Conservation Area. Ausable Bayfield Conservation Authority operated seasonal group camping, hiking trails, fishing, and canoeing at Parkhill Conservation Area.

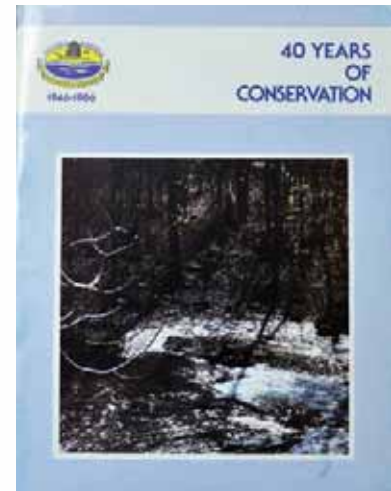
A new gatehouse and docking facilities were added to the Port Franks Conservation Area.

The private land tree planting program continued to grow reaching levels of 500,000 trees annually in the mid-1980s, mostly due to an Ontario Hydro program to compensate landowners for trees removed during the development of the high voltage transmission line between the Bruce Nuclear Generating Station and south London.

In 1989, the conservation authority restructured the Board of Directors numbers from 35 to 16.

The 1980s saw increased use of personal computers for office tasks.

Under the Flood Forecasting and Warning Program, ABCA began to use computer systems and telephone connections to monitor stream gauges.



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1990s

Ausable Bayfield Conservation Authority leased the campground at Parkhill Conservation Area to the private sector.

Port Franks Conservation Area was sold to the Municipality of Lambton Shores.

Between 1992 and 1993, Ausable Bayfield Conservation Authority engaged the public in creation of a Conservation Strategy to guide the local agency into the future.

This was followed by the 1995 Watershed Management Strategy (WMS-1995) which translated the community's mission and vision into quantifiable actions and targets. The WMS-1995 detailed 36 subwatersheds based on stream order and features. The document outlined the stresses and action plans for each of those areas.

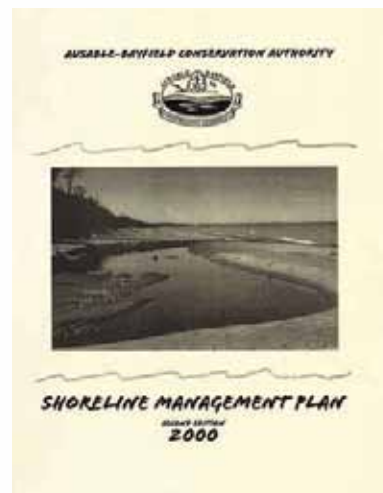
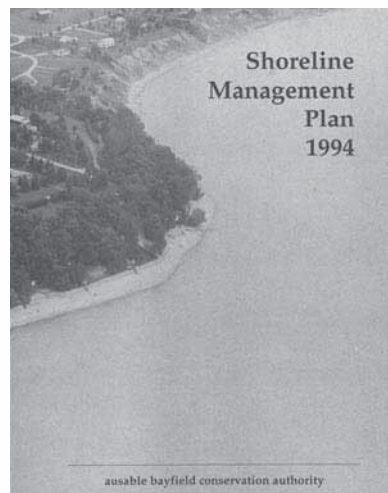
The 1990s decade saw the start of Geographic Information Systems (GIS) technology use by conservation authorities with the Watershed Management Strategy being the first major use of GIS by Ausable Bayfield Conservation Authority.

In 1996, elimination of provincial representation on the board reduced the Board of Directors numbers from 16 to 14.

The Lake Huron Shoreline Management Plan was approved.

In 1999 the first ortho-rectified aerial photography images of the watershed were produced.

Reductions in provincial funding for conservation authorities in the 1990s required some programs to be scaled back. The water quality monitoring program was suspended for a few years.



A MEMBER OF THE CONSERVATION ONTARIO NETWORK





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Bluewater

Central Huron

Huron East

Lambton Shores

Lucan Biddulph

Middlesex Centre

North Middlesex

Perth South

South Huron

Warwick

West Perth



2000s

Many municipalities in Ontario were amalgamated in 2000. Following this restructuring, the number of directors on the ABCA Board of Directors declined from 14 to 9.

In 2001, the Board of Directors approved a new logo for the conservation authority: building blocks portraying water, plant life, and sunlight – foundation elements for survival. The organization was publicly branded as 'Ausable Bayfield Conservation.' The motto, or tag line, 'Building Better Environmental Conscience' was adopted.

The conservation authority also launched its first website in 2002. The Ausable River Recovery Team was established in 2002.

Ausable Bayfield Conservation celebrated the planting of its 5 millionth tree on May 5, 2002. Tree planting levels through the decade ranged mostly between 50,000 and 70,000 trees annually. Following the Board of Directors' recognition of the need for better water quality information, Ausable Bayfield Conservation Authority's water quality monitoring program was expanded in 2003.

The Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (*Ontario Regulation 147/06, under Ontario Regulation 97/04*) replaced the Ausable Bayfield Conservation Authority's Fill, Construction and Alteration to Waterways Regulation which had been the governing set of regulations for roughly 20 years. The conservation authority's revised regulation was part of the Red Tape Reduction Act and is designed to protect public safety from natural hazards through the issuance of permits for works close to lakes, rivers, streams, wetlands, or sinkholes.

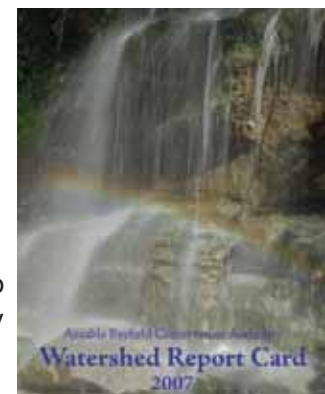
Ausable Bayfield Conservation undertook sinkhole studies in the former townships of Hibbert and Tuckersmith between 2004 and 2006. With the creation of the *Ontario Clean Water Act, 2006*, Ausable Bayfield Conservation Authority assumed new responsibilities as lead source protection authority and the drinking water source protection planning project was launched.

Ausable Bayfield Conservation released its first *Watershed Report Card* in 2006. Staff supported local watershed plan preparation and implementation in local watershed communities including the Old Ausable Channel, Bayfield North, and Main Bayfield watersheds.

The first decade of the 21st century saw increased use of Internet, the advent of high-speed connections in the office, increased use of email, and provincial and federal programs to support GIS initiatives.

The CA Maps (camaps.ca) mapping project was created in partnership with the Ontario Ministry of Natural Resources (now Ontario Ministry of Natural Resources and Forestry) and five other conservation authorities. The internal Intranet Mapping Site (IMS) was also established, giving all staff greater access to location-specific information.

Partnerships between the Province of Ontario, municipalities, conservation authorities, and the private sector were formed to acquire digital air photos across Southwestern Ontario at five-year intervals. Financial incentives that had been cut in the 1990s were once again offered for landowners to undertake stewardship projects to improve and protect water quality.



2010s

Adelaide Metcalfe

In March 2012, the community's Conservation Strategy Development Team released *The Path Forward: Your Community Conservation Strategy for Ausable Bayfield Watersheds*.

Bluewater

The Conservation Strategy articulated a new mission and vision. It also created a new logo for Ausable Bayfield Conservation: a stylized Black Cherry leaf and stylized wave and a new motto or tag line: 'Creating Awareness, Taking Action.' The Black Cherry is an important forest tree for wildlife because of its fruit and the leaf represents landowner actions taken to plant trees, create and enhance wetlands, and improve forest conditions. The wave represents the implementation of projects to protect and improve water quality and quantity.

Central Huron

Huron East

Lambton Shores

Lucan Biddulph

Middlesex Centre

North Middlesex

Perth South

South Huron

Warwick

West Perth

A new *Watershed Report Card* was released in 2013. It offers data on four main resource categories of watershed health: surface water quality; groundwater quality; wetland cover; and forest conditions. The document also provides actions that individuals, communities, and local agencies can take to improve these measures of ecosystem health.

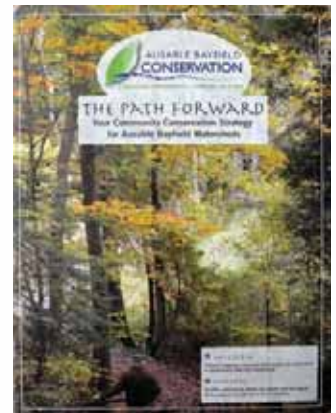
A climate change monitoring station was established in the watershed with data retrieval via satellite.

Newer data loggers in the monitoring network allow collection of stream water data at shorter time intervals.

Tablets, smart phones and other mobile technologies were part of the changing technological landscape.

In 2010, following input by the Conservation Strategy Development Team, Ausable Bayfield Conservation adopted its social media policy, which focused on newer technologies to communicate with the public.

In 2011, Huron Tract Land Trust Conservancy was formed to work with landowners to protect natural areas.



6.2 Where we are today?

6.2.1 The Social and Economic Climate

The Ausable Bayfield Conservation Authority has a long history of successfully working alongside groups with varied interests. The ABCA shall continue to partner with multiple community groups and levels of government. As the conservation authority moves forward with these partnerships, key issues and opportunities are emerging which will need to be considered. They include:

- The desirability of the Lake Huron shoreline which has increased pressures on the waterfront for tourism and permanent residential development.
- Climate change presenting numerous challenges including increased storm and flood risk, greater fluctuations in lake levels, impacts to ecosystem health, invasive species.
- Evolving agricultural practices present opportunities, and challenges, to improve watershed health.
- A strong push for financial accountability and efficiency for all levels of government and agencies spending has pushed for tighter budgets and higher returns on investment.

6.2.2 Watershed Challenges

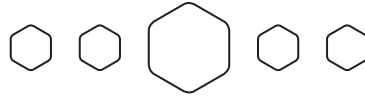
By far the most extensive land use of the watershed is agriculture – both row crops and livestock operations. Forest cover is currently at 14.1 per cent of the watershed, with a few notable exceptions. A goal is to increase forest cover but in a practical sense it may take a concerted effort just to maintain the tree cover that currently exists through county forest conservation bylaws. Lakeshore cottage and home development extends along most of the Lake Huron shoreline. Municipal Official Plans and the Provincial Policy Statement direct development be focused around existing towns.

Water quality remains a concern in the watershed. Monitoring has demonstrated that concentrated flow paths which form during storm events, contribute to elevated nutrients, sediment and bacteria in downstream water-courses. Interrupting storm flows across the landscape will help protect and improve downstream water quality.

Water quantity has been influenced by changing land use practices combined with artificial drainage networks across the landscape. As a result, lands generally drain faster and result in quicker runoff with less water retention on the landscape available to maintain baseflow. Retaining water in headwater regions would help to slow the movement of water through the watershed and potentially reduce flooding.

Wetlands cover only 2.4 per cent of the watershed. Wetlands contribute positively to water quality and water quantity.





Living Things:

- Loss of wetland habitat in much of the watershed, resulting in decreased biodiversity.
- High biodiversity in parts of the watershed – Pinery/Lower Ausable area and Lower Bayfield/Trick's Creek.
- Forest Cover – The 2013 *Ausable Bayfield Watershed Report Card* document said forest conditions remained limited in the watershed with most receiving a D grade.
- Wetland Cover – Most watersheds received F grades for wetland cover according to the 2013 *Watershed Report Card*.
- Climate change is contributing to invasive species spread and will alter habitat conditions at a rate beyond that of many communities and species to adapt.
- Invasive species are spreading (e.g., Emerald Ash Borer; *Phragmites australis* – European Common Reed) and harming remaining natural areas and aquatic communities.



Water:

- Water quality – Most watersheds received a C grade for water quality, according to the 2013 *Watershed Report Card*.
- The popularity of lakefront property, and the evolution of small cottages to larger and more permanent homes by the water, increase the number and size of septic systems along the lake as well as development that has the potential to affect shoreline structures, erosion, and water quality.
- Some residents get their drinking water from wells (groundwater) such as private wells and municipal wells in Zurich, Brucefield, Seaforth, Clinton; and other municipal wells north of Bayfield. Other residents have Lake Huron as their drinking source (raw lake water drawn from the intake at Port Blake, near Grand Bend, is treated at the Lake Huron Primary Water Supply System and then piped to consumers inside and outside of the watershed.)
- There is a high proportion of headwater area. Therefore, private land management has a major impact on streams.
- High land costs and variable commodity prices affect stewardship decisions.
- Loss of wetland cover reduces flood water storage and filtering capacity, negatively affecting water quality.

Soil:

- This part of Ontario is a leader in food production. The land's ability to support livestock and crops and the need for more farm land, has led to more intensive use of local land.
- The intensive concentration of livestock and cash crop production in the watershed requires effective management of nutrients.
- Management of surface water is necessary to preserve topsoil limit erosion, and keep nutrients sediment, bacteria, and chemicals out of creeks, rivers, and the lake.
- Sub-surface water is managed for crop production but presents a challenge with nutrient losses through artificial tile drainage networks.
- Soil health is a critical component of successful agriculture and a robust watershed that is resilient to degradation.

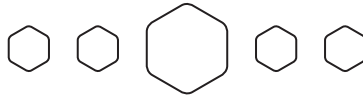


6.2.3 Ausable Bayfield Conservation: Key Accomplishments

Ausable Bayfield Conservation has a long and proud past of working in close cooperation with the watershed community and considers its accomplishments to include:

- Good working relationships with community groups.
- Leadership in watershed monitoring and research has assisted the conservation authority and other agencies to evaluate best management practices.
- Local leader in flood plain management through programs focused on flood forecasting and warning.
- Developed programs to inspect, maintain and improve flood and erosion control projects completed by the ABCA.
- Assisted thousands of landowners to undertake voluntary stewardship projects.
- Through education and extension work the watershed community helped foster the growth and adoption of best management practices.
- Enhanced and protected, through ownership, 9,000 acres of land which helps Ausable Bayfield Conservation to achieve its environmental goals while providing places for recreation, education and nature appreciation.
- Thoughtful management of conservation authority lands that balances many interests.
- Largest landowner, in the watershed, of outdoor recreation areas for the public offering a variety of activities.
- Vibrant conservation education program including field trips, in-school programs, day camps; action-oriented education projects for youth and community.
- Sylvan Conservation Education Program celebrated 50 years of continual outdoor education in 2014.
- Lead on the drinking water source protection program in the Ausable Bayfield Maitland Valley Source Protection Region.
- Local expert in natural heritage.
- In 1974, facilitated the creation of the Ausable Bayfield Conservation Foundation, which in 2011, created the Huron Tract Land Trust Conservancy.
- Comprehensive data and information holdings.
- Recognized leader in providing comments and advice, directing development away from natural hazards, protecting life and property.
- Successfully leveraged local funds with other funding agencies.





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