

PERIODIC REVIEW REPORT

JANUARY 2024

Prepared for the
Canadian Commission
for UNESCO and the
International
Coordinating
Council of the MAB
Programme



Niagara
Escarpment
Biosphere
Network



Onandaga singer/drummer Franklyn McNaughton visits the spirits of fallen warriors, as twilight illuminates Chippawa Battlefield.

LAND ACKNOWLEDGEMENT

The Niagara Escarpment Biosphere Network (NEBN) wishes to acknowledge and honour the lands of the Niagara Escarpment as the traditional territory of Indigenous peoples. In both spirit and partnership, we recognize and thank the Anishinaabek, Huron-Wendat, Tionontati, Neutral Nation, Haudenosaunee, Métis, and all who provided stewardship of these lands over millennia.

Recognition of the contributions of Indigenous peoples is consistent with our commitment to making the promise of Truth and Reconciliation real in our communities. We are grateful for the opportunity to live, work, and play here and thank all those who have served and continue to serve as caretakers of this special place.

We are also mindful of broken covenants and the need to reconcile with all our allies and relations. Together, may we care for this land and each other, drawing upon the strength of our mutual history through peace and friendship, to create a lasting legacy of conservation for generations to come.

On the cover: A clear, moonless twilight, reveals the sweep of the Milky Way with a hint of aurora borealis “northern lights” over Sydney Bay Bluffs at Neyaashiinigmiing FN. A fortuitous geographic location, low level of development and an active local dark sky community combine to keep light pollution at bay on Saugeen/Bruce Peninsula

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Blessed with a unique microclimate and plentiful groundwater movements out of the slope of the Escarpment, a fertile paradise of emerald fields stretches across the township of Lincoln.

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ACKNOWLEDGMENTS

We wish to express our love and our deep gratitude for the lands and waters that are essential to the web of life throughout the Niagara Escarpment Biosphere. In the western knowledge system, we refer to this as biodiversity, and from an Indigenous knowledge system, we acknowledge the interconnectedness of all life and our associated responsibilities. We are equal with all other species; we are not superior. And we humbly give thanks for all that those many species contribute to life, both generally, and in the Niagara Escarpment Biosphere.

Thank you for the many contributors to the creation of this self-study.

Essential to this work has been the steady support provided by **Environment and Climate Change Canada** through its multiyear contributions to the Indigenous NGO Plenty Canada for the project entitled *Qualifying United Nations Educational, Scientific and Cultural Organization Buffer Zones as Other Effective Area-based Conservation Measures within the Niagara Escarpment Biosphere, Ontario*. This initiative helped establish the Niagara Escarpment Biosphere Network as the official entity that is working on the mandate and designation of the UNESCO Niagara Escarpment Biosphere as a community-led, grassroots, co-governed, not-for-profit organization.

In addition, the **Niagara Escarpment Foundation** provided generous funding to help complete the 2024 self-study. We would also like to acknowledge Linda Pim, Secretary-Treasurer, Niagara Escarpment Foundation for her continued support of the network and active involvement in the biosphere.

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ABBREVIATIONS

AGM Annual General Meeting	CWMP Coastal Waters Monitoring Program	LCN Land Care Niagara
ANSI Areas of Natural and Scientific Interest	CYBN Canadian Youth Biodiversity Network	LEED Leadership in Energy and Environmental Design
AOL (Bachelor of) Arts in the Ogwehweh Languages	DSBN District School Board of Niagara	LGBTQ2+ Lesbian Gay Bisexual Transgender Queer Two-Spirit + people who identify as part of sexual and gender diverse communities, who use additional terminologies
ASPnet Associated Schools Network	EBC Escarpment Biosphere Conservancy	MAB Man and the Biosphere
BAOL Bachelor of Arts in the Ogwehweh Languages	EBR Environmental Bill of Rights	MAB-ICC Man and the Biosphere International Coordinating Council
BPBA Bruce Peninsula Biosphere Association	ECCC Environment and Climate Change Canada	MCL Masters of Conservation Leadership (University of Guelph)
BPD Bruce Peninsula District	EDI Equity, Diversity, and Inclusion	MEA Multilateral Environmental Agreement
BTC Bruce Trail Conservancy	EFPN Escarpment Forest Plot Network	MI Mohawk Institute Residential School
CA Conservation Authority	ERO Environmental Registry of Ontario	MLA Master of Landscape Architecture
CBC Canadian Broadcasting Company	ES Ecosystem Services	MMA Ministry of Municipal Affairs
CBD Convention on Biological Diversity	ESA Ecosystem Service Assessment	MNO Métis Nation of Ontario
CBRA Canadian Biosphere Reserves Association	FMP Forest Management Plan	MNRF Ministry of Natural Resources and Forestry
CCIM Canadian Coalition of Inclusive Municipalities	GDP Gross Domestic Product	MOECP Ministry of the Environment, Conservation, and Parks
CC-MAB Canadian Committee – Man and the Biosphere	GGH Greater Golden Horseshoe	MOU Memorandum of Understanding
CCUNESCO Canadian Commission for United Nations Educational, Scientific and Cultural Organization	GIO Green Infrastructure Ontario Coalition	MT Million Tonnes
CEO Chief Executive Officer	GTA Greater Toronto Area	NCC Nature Conservancy of Canada
CT Cool Temperate (eco-climatic zone)	HCA Hamilton Conservation Authority	NCP Nature’s Contributions to People
CVC Credit Valley Conservation	IC (CRBA’s) Indigenous Circle	NE Niagara Escarpment
	ICC International Coordinating Council	
	ICE Indigenous Circle of Experts	
	IPCA Indigenous Protected and Conserved Area	

NEF
Niagara Escarpment Foundation

NEP
Niagara Escarpment Plan

NEPDA
Niagara Escarpment Planning and Development Act

NEPOSS
Niagara Escarpment Parks and Open Space System

NGO
Non Government Organization

NHIC
National Heritage Information Centre

NHS
Natural Heritage Systems

NOTL
Niagara-on-the-Lake

NPCA
Niagara Peninsula Conservation Authority

NRC
Niagara Restoration Council

OAGO
Ontario Auditor General's Office

OCAP®
Ownership, Control, Access, and Possession

OECM
Other Effective Area-Based Conservation Measure

ONE
Ontario's Niagara Escarpment Monitoring Program

OPG
Ontario Power Generation

ORMCP
Oak Ridges Moraine Conservation Plan

PA
Protected Area

P.O.W.E.R.
Protect Our Water and Environmental Resources

P-Q
Point-Quartier

RBG
Royal Botanical Gardens

SAR
Species at Risk

SAROS
State of Aggregate Resources Study

SDG
Sustainable Development Goal

SNP
Six Nations Polytechnic

SON
Saugeen Ojibway Nation

SWO
Sustainable Winegrowing Ontario

TGNE
The Great Niagara Escarpment

TLC
Transitional Leadership Committee

TRC
Truth and Reconciliation Commission

TRCA
Toronto and Region Conservation Authority

UN
United Nations

UNDRIP
United Nations Declarations of Rights of Indigenous Peoples

UNESCO
United Nations Educational, Scientific and Cultural Organization

UNESCO-MAB
United Nations Educational, Scientific and Cultural Organization – Man and the Biosphere

U of T
University of Toronto

UW
University of Waterloo

VSP
Vegetation Sampling Protocol

WCC
Woodland Cultural Centre

WNBR
World Network of Biosphere Reserves

MESSAGE FROM THE CO-CHAIRS

On behalf of the Niagara Escarpment Biosphere Network, we are pleased to submit the Self-Study to kick off the 10-year periodic review for the time period 2013 through 2023. During this period, a fundamental change in the coordination of the Biosphere designation happened – a transition from the oversight of the Niagara Escarpment Commission (Commission) to the newly formed non-profit, volunteer-led Niagara Escarpment Biosphere Network (Network). The Network was officially incorporated as a not-for-profit in March 2022.

This transition represents a response to one of the recommendations made in the previous review, i.e. that it was inappropriate for the leadership of the Biosphere to remain solely under the guidance of a government agency. The second recommendation regarding the engagement of Indigenous people and First Nations in the Niagara Escarpment Biosphere (Biosphere) activities was achieved by changing the organizational approach for the Biosphere. The Network has been enabling the participation of Indigenous representation on the board itself and in the way we approach co-governance. From our perspective, this is our most important milestone and achievement.

We recognize that we are only just beginning the ongoing journey that the “Two-Eyed Seeing” and “Ethical Space” approaches with our governance will take us. We have embarked with good intentions, but we still have a long way to go. Having only been operational for less than two years, the impact we are working towards is not yet fully realized. We have, however, attracted a high calibre of leaders to our board with geographic, gender and Indigenous perspectives all well represented. We believe that as we continue to focus on building our organizational capacity, as we develop and follow a strategic path, we will secure the resources to undertake the activities and programs concomitant with the important trust that has been placed in us.

Our naming of the new organization as a “network” is also significant. Clearly the Commission and its land use plan and administrative authority will remain a huge component of protecting core natural areas, as will the roles of local government, land trusts and conservation authorities. There are many citizens, businesses, municipalities, non-governmental organizations, and academic institutions now involved in supporting the work on conservation,

climate change and sustainability along the Escarpment. As a network, we see our role as facilitators to accelerate knowledge transfer among these organizations and individuals so that good, impactful projects can be replicated or expanded. We will be celebrating and showcasing successful practices and monitoring the outcomes for the Escarpment environment. We are not there yet but are convinced we can activate the good will that many current champions of the Escarpment and Biosphere have already shown us.

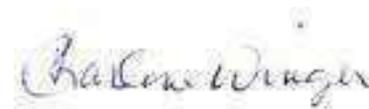
These central aspects of the Network are threaded through the self-study as we sought to marshal information from before our existence and position our forward-looking mandate at the formative and early stage in which it now exists. In this context, we recognize that the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Canadian Commission for UNESCO (CCUNESCO) may offer us guidance on interim milestones and priorities we might pursue, as warranted by the designation as a World Biosphere. We welcome the insights which will be forthcoming as we host the site reviewers and receive your feedback.

Sincerely, on behalf of the Network,



Norman Ragetlie

Co-Chair



Charlene Winger-Jones

Co-Chair



Liette Vasseur,

*Niagara Escarpment Biosphere Periodic Review
Committee Chair*

PART I: SUMMARY



An ancient sea bed, fossilized coral reef and former mountain range - the Niagara Escarpment defines a huge geographic area across Southern Ontario, including Bruce Peninsula National Park.

A) Biosphere Reserve: Niagara Escarpment Biosphere (Biosphere), Ontario, Canada

B) Country: Canada

C) Year of Designation: 1990

D) Year(s) of Periodic Review: 2000, 2012-2014

E) Previous recommendation(s) made by the International Co-ordinating Council (MAB- ICC).

The recommendations that derived from the 2012 periodic review requested further information and adaptations to: the size of the buffer and transition zones, a balanced view on sustainable development, a collective and collaborative network with municipalities, private businesses, public agencies, First Nation communities, NGOs, and landowners, and increased collaboration between the Biosphere and national and international Biospheres.

F) What follow-up actions are completed and if not completed/initiated, please provide justifications.

The follow-up actions have been completed to the satisfaction of the UNESCO Man and the Biosphere International Co-ordinating Council. Please see 1.3 for further detail.

G) Update on the implementation of measures to achieve the objectives of the Biosphere reserve.

Since the Biosphere's inception in 1990, the policy framework surrounding the various zones of the Niagara Escarpment Plan facilitated the management of the established core area, buffer zone and outer transition area of the Biosphere. Provincial policy has similarly provided direction for the sustainable development function in the area of the Biosphere. This includes Provincial Policy Statements which provide overall policy directions on matters of provincial interest related to land use and development in Ontario, and applies throughout the Niagara Escarpment Plan (NEP) Area. Decisions made by municipalities, planning boards, the Province, or a commission or agency of the government (including the Commission) must be consistent with the Provincial Policy Statement.

The Niagara Escarpment Plan, 2017 (NEP 2017) builds upon this policy foundation and provides additional land use planning policies for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment and to ensure that only such development occurs as is compatible with that natural environment. The NEP is utilized as a mechanism to manage human use and activities related to development within the zones of the Biosphere. The NEP 2017 is to be read in conjunction with the Provincial Policy Statement but shall take precedence over the policies of the Provincial Policy Statement to the extent of any conflict. Where the NEP 2017 is silent on policies contained within the



Kayakers traverse Georgian Bay in silhouette of a magnificent sunset.



Aki (Land) Guardians of the Bagida'waad Alliance learn from their youth leader Christopher Akiwenzie about ecology and species at risk.

Provincial Policy Statement, the policies of the Provincial Policy Statement continue to apply, where relevant.

The Niagara Escarpment Parks and Open Space System (NEPOSS) council was developed to facilitate discussion among public land owners within the biosphere concerning topics pertaining to the logistic and conservation functions of the Biosphere. The lands within the NEPOSS area have been acquired to protect the natural and cultural heritage of the Escarpment, and land owners are required to submit management plans to be submitted to the council. NEPOSS Council monitors and oversees the successes and failures of the management plans for protective areas across the Biosphere. See 2.4.2 and 2.4.3 for more details on NEPOSS. The Network is working towards developing a strong partnership with NEPOSS council.

Provincial plans should also be read in conjunction with other provincial plans, as defined in the Planning Act, that may apply within the same geography. Within the NEP 2017 Area, these include the Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, and the Parkway Belt West Plan. Other plans, including source protection plans under the Clean Water Act, 2006, may also apply within the NEP 2017 Area. Each of these plans applies to certain defined parts of the NEP 2017 Area and provides specific policy on certain matters.

Provincial plans must also be implemented in a manner that is consistent with the recognition and affirmation of existing Aboriginal and Treaty rights under Section 35 of the Constitution Act, 1982. The Province of Ontario is committed to developing collaborative relationships with First Nations and Métis people, communities and organizations, based on mutual respect and dignity.

With the establishment of the Network as the new convener of the Biosphere, the role of the Niagara Escarpment Plan, its designations and Biosphere zonation may need to be renegotiated and defined collaboratively with all partners, including the Commission. This may take some time and may be part of the strategic plan of the Network that is to be developed.

H) Briefly describe the process by which the current periodic review has been conducted

The process included: Conducting multiple large gatherings of all rights holders / interest holders / stakeholders / partners for community input, updating zonation maps in consultation with Escarpment Corridor Alliance and Escarpment Biosphere Conservancy, and several discussions and surveys with researchers, knowledge holders, and conservation organizations across the Biosphere. See 1.5 below for further details.

I) Area and spatial configuration:

		Proposed changes (if any)
Area of terrestrial Core Area(s)	Approximately 38% of the Biosphere or 73,483 hectares	N/A
Area of terrestrial Buffer Zone(s)	Approximately 55% of the Biosphere or 108, 435 hectares	N/A
Area of terrestrial Transition Area(s)	Approximately 7% or 13,138 hectares	N/A
Area of marine Core Area(s)	0	N/A
Area of marine Buffer Zone(s)	0	N/A
Size of marine Transition Area(s)	0	N/A
Total Area of Biosphere:	195, 055 hectares	

J) Human population of the Biosphere:

Table 1. Population in the NEB boundaries. Data retrieved from Statistics Canada 2021, Census of Population

Name	2021 Population Census	Percentage of the NEB
Burlington	186,948	12.56
Caledon	76,581	5.14
Chatsworth	7,080	0.475
Clearview	14,814	0.995
Georgian Bluffs	11,100	0.745
Grey Highlands	10,424	0.700
Grimsby	28,883	1.94
Halton Hills	62,951	4.23
Hamilton	569,353	38.25
Lincoln	25,719	1.72
Meaford	11,485	0.77
Milton	132,979	8.93
Mono	9,421	0.630
Mulmur	3,571	0.239
Niagara Falls	94,415	6.34
Niagara-on-the-Lake	19,088	1.28
Northern Bruce Peninsula	4,404	0.295
Owen Sound	21,612	1.45
Pelham	18,192	1.22
South Bruce Peninsula	9,137	0.613
St. Catharines	136,803	9.19
The Blue Mountains	9,390	0.630
Thorold	23,816	1.60
Total	1,488,169	100%

There has been continued population growth within the 31 municipalities in the Biosphere. See 2.2.3 for more detail.

When the periodic review took place, the Network faced constraints in accessing comprehensive population data across the core, buffer, and transitional zones. Efforts are underway to establish a collaborative framework with Statistics Canada. This aims to facilitate the annual sharing of such data, enabling more thorough future periodic reviews.

K) Budget (main sources of funds, special capital funds) and international, regional or national relevant projects/initiatives carried out or planned.

The Commission was created more than 40 years ago to ensure the long-term protection of the ecological and scenic value of the Niagara Escarpment. The Commission has relied on the province (Ministry of Natural Resources and Forestry (MNRF)) and the broader government for the staff and financial resources needed to deliver the Niagara Escarpment Program and to deliver on its role as Biosphere convenor since the designation of the Biosphere in 1990. The implementation of the Niagara Escarpment program is a significant contribution to the biosphere goal, as such, the entire budget of the Commission could be identified as supporting the biosphere.

The Commission's budget allocation has remained relatively stable at approximately \$2,400,000 from 2012-13 to 2019-20, with a full-time equivalent staff of 24.. The Commission's allocation was increased in 2020-21 to \$2,647,000..The 2022-23 budget also included additional salary dollars to assist with the [Commission's IT Modernization project](#).

While the Commission is no longer convenor of the Biosphere (ended in 2019), it is hoped that the Commission will continue to contribute to the work of the Biosphere by providing access to data and information for the updates to the NEP 2017, [NEPOSS](#), development, conservation, research and monitoring and providing reports on indicators.

Despite the recent change in convenorship from the Commission to the Network, it is essential the Network strives to develop a consistent annual operating budget. The current primary source of funds for the Biosphere is from the "Qualifying United Nations Educational, Scientific and Cultural Organization buffer zones as Other Effective Area-based Conservation Measures within the Niagara Escarpment Biosphere, Ontario." This project is funded by the Environment and Climate Change Canada and administered by Plenty Canada. The Network has also received funding from the Greenbelt Foundation and the Niagara Escarpment Foundation (See 2.3.2 for more details.)

L) International, regional, multilateral, or bilateral framework of cooperation. Describe, where applicable, the contribution of the Biosphere reserve to achieve objectives and developing mechanisms that contribute to the implementation of international or regional bilateral or multilateral agreements, conventions, etc.

The Network actively engages in various international,

regional, and multilateral frameworks of cooperation to contribute to the achievement of shared objectives. Through its commitment to environmental sustainability, the Network aligns its efforts with international agreements, conventions, and frameworks aimed at promoting biodiversity, conservation, and sustainable development. Additionally, the Network seeks to develop mechanisms that facilitate the implementation of these agreements, fostering collaboration and shared responsibility in addressing global environmental challenges. However as a non-governmental organization, the Network is not the governmental entity steering legal policy or frameworks within the Biosphere such as the NEP 2017. When UNESCO designated the Niagara Escarpment as a World Biosphere in 1990, the decision was influenced by the Niagara Escarpment Plan's vision of reconciling preservation, conservation, and sustainable development - a goal up-held by Biosphere reserves around the globe. This prestigious designation recognizes the Escarpment as an internationally significant landform that promotes environmental sustainability with compatible human activities. The NEP is led and managed by the Commission and continues to contribute to the sustainable objectives of the Biosphere.

The current Biosphere area covers portions of seven Conservation Authorities and 23 local municipalities, within seven regions and counties, and the City of Hamilton. Maps of the NEP area (analogous to the Biosphere area) can be found on the Commission [website](#). A full list of the municipalities found within the NEP area is contained in Annex II. The Memorandum of Understanding between the Minister and the Commission mandates that the Commission has a duty to engage, consult, and cooperate with Indigenous Peoples and groups across the Plan Area.

Please refer to the Office of the Auditor General of Ontario: Value-for-Money Audit: Conserving the Niagara Escarpment (page 54) for a description of [“Other Legislation, Entities and their Effects”](#) within the Biosphere.

The Network is part of the World Network of Biosphere Reserves (WNBR). It aims to promote and support frameworks, including the United Nations Sustainable Development Goals (SDGs), the UN Declarations of Rights of Indigenous Peoples (UNDRIP), the Statutory Framework of the World Congress of Biosphere Reserves, and the [Lima Action Plan](#), at a grassroots local level. In addition to being a member of the UNESCO family, the Network is a member of the Canadian Biosphere Reserves Association (CBRA), and thereby is advised by the Truth

and Reconciliation Commission of Canada's (TRC) Calls to Action and Pathway to Canada Target 1. (The Pathway to Canada Target 1 initiative produced three reports, [‘One with Nature’](#), [‘Canada’s Conservation Vision’](#), and [‘We Rise Together’](#), which provide broad guidance to meet the terrestrial and inland water elements of Canada Target 1, based on Aichi Target 11). The Network is similarly advised by and contributes to multilateral agreements such as the Paris Agreement and the United Nations Framework Convention on Climate Change. Through funding provided by Environment Climate Change Canada, the Network has committed to contributing to the research and development of Other Effective Conservation Measures (OECMs) in our biosphere, following the guidance of the Convention on Biological Diversity. As a Biosphere in Canada, the Network is a part of the 2030 National Biodiversity Strategy and Ontario's Biodiversity Strategy.

By participating in these global and national initiatives, the Network not only enhances its own conservation practices but also contributes to the broader international community's goals for environmental protection and the well-being of ecosystems. It also continues to hold the intent to be guided and advised by the spirit of CBRA's Indigenous Circle and the circle's working group Skaabawiis. The Network also acknowledges the significance of the wampums crafted on the ancestral lands of our First Nations peoples, as well as the original agreements forged between Indigenous Peoples and settlers. Further details on the Dish with One Spoon, Two Row Wampum, Royal Proclamation of 1763, Treaty of 1764, and Two-Eyed Seeing and Ethical Space are provided below.

DISH WITH ONE SPOON

“Focus a little bit less on the government to government and more on people to people (Historica Canada, 2020).”

[Dish with One Spoon](#) is a treaty, perhaps before that a law, that governed multinational relations between and among various Indigenous nations, long before settlers arrived. Notably, the Haudenosaunee Great Law of Peace refers to the Dish with One Spoon. Also, the Haudenosaunee and Anishinaabek peoples used the Dish with One Spoon to help govern their collective relationships with the land. It was predicated on the appropriate sharing of territories for gathering and hunting. The Dish (sometimes referred to as the Bowl) represents Mother Earth. The Dish is a source of life for all living things. For Indigenous nations, the Dish represents the land to be shared in peace, with respect for ancestors and future generations. The Spoon represents the people who will share the gifts of the land.

The understanding was that people were only to take what they needed (food, clothing, shelter, medicine), while considering the needs of others and to only take in a way that keeps the Dish clean and unharmed, allowing it to continue to renew life in its full capacity.

For example, the Haudenosaunee and Anishinaabek peoples practiced what is known as either the Edge of the Forest Ceremony or the Smoky Fire Ceremony. This ceremony announced the presence of a hunting or gathering party and their intention to come in peace and to provide sustenance for their families. Often, pipes were smoked, a feast was shared, and a party's harvest plans were outlined.

The Dish with One Spoon principles were used by over 60 First Nations and, though principally identified with the Great Lakes and Northeastern North America, were found in such places as Cree and Cherokee territory, in what is now the state of Georgia. As the Europeans arrived, the Dish with One Spoon treaty was shared and incorporated into significant treaties, such as the Treaty of 1701 and the Treaty of 1764. However, there was a disconnect between the European concept of property and Indigenous relationships to the land. Indigenous scholars, such as Leanne Simpson from Alderville First Nation, point out that not only would Indigenous nations share the land,

but they would maintain their sovereignty. Therefore, the Spoon recognized the diverse nature of Indigenous nations and cultures. More and more, an understanding of the Dish with One Spoon and its link to natural law is developing among settlers and in their relationship with Indigenous Peoples and the land.

The Dish with One Spoon provides critically important guidance for diverse interests to share the land, including in Biospheres, in such a way as to remain in harmony with natural law. Thinking of Multilateral Environmental Agreements (MEAs), the Dish with One Spoon can be an important tool to mitigate climate change, reduce biodiversity loss, and address soil depletion.

TWO ROW WAMPUM

Wampum belts are “woven” through Haudenosaunee and Anishinaabek history as mnemonic devices used to record relationships and treaties between Indigenous nations of the eastern woodlands and European nations and settler societies now known as Canada and the United States. One of the essential wampum belts that metaphorically and symbolically framed the aspirational basis of these international relations is the Two Row Wampum, which emerges from the language of Haudenosaunee protocols.



Zigzag cliffs above Sydenham River are the result of bedrock cracking that may have been caused by high horizontal stresses in the bedrock.



Charlene Winger-Jones is co-chair of the Network, an Elder, Water Walker, Hereditary Council member & Climate Reality Leader from Neyaashiinigiing First Nation.

Wampum Belts are important to Haudenosaunee understanding of history. The founding principles of treaty making with Europeans can be found in the oral tradition of the Tékeni Teioháte, or Aterihwihsón:sera Kaswénta, which is the proper name of the Two Row Wampum. Kaswénta (Guswenta) refers to something that is rolled out. This is the name commonly associated with any wampum belt. In this case it is very appropriate because it represents the path of life laid out before the Haudenosaunee by their ancestors. In addition, a wampum belt was rolled up for storage, and when it was to be “read” it was rolled out, and held by one end as the speaker would recite the message it contained.

In the Haudenosaunee language, a treaty is called “a completed matter.” However, this does not reflect how deeply people felt about these agreements. The treaty council was part ritual, part political diplomacy, and part cultural performance. To truly understand the meaning of a treaty, we need to study what led up to the treaty, what was discussed and agreed to along the way, what oral history is associated with the council or any wampum belts attached to it, as well as any written minutes, journals and subsequent reflections. Just reading the printed version of

the treaty is not enough to understand what it meant to the people who completed the matter.

In modern times, the term Guswenta or Kaswéntha, represents “the River of Life.” As long as the rivers run down hill and as long as the grass grows green, we shall keep this covenant. We agreed to call one another brothers. We agreed that our canoe and your ship would travel side by side down the river of life in mutual respect, each in our own vessel. This established the standards for future agreements, covenants, and treaties. This we called the grandfather of all treaties. Today, we still hold to this covenant, and we expect our treaty partners to do the same.

Haudenosaunee delegation statement, Sub-Committee on Prevention of Discrimination and Protection of Minorities, Working Group on Indigenous Populations, Fifteenth Session, United Nations, Geneva, Switzerland, July 28-Aug 1, 1997

The meaning that the Haudenosaunee give to the Two Row wampum belt extends back nearly four centuries. It represents the collective memory of the Haudenosaunee, preserved in their language and repeatedly referenced in various treaty councils throughout that time.

The visual symbol of the shell wampum belt features two purple rows on a white path. White symbolizes peace and friendship and the purity of the agreement. The two rows of purple symbolize the spirit and culture of two distinct nations which are entering into a relationship. There are three rows of white beads between the two purple rows that symbolize the concepts of Peace, Friendship, and Respect.

The two purple rows represent separate paths on the river of life. They are equal, but they do not cross, meaning that both nations agreed not to interfere with each other's right to govern themselves. We are to respect each other. This really means that the first Europeans agreed to respect Haudenosaunee sovereignty and not impose their way of life upon the Haudenosaunee. All subsequent treaties have maintained that same principle.

The imagery of the Two Row Wampum tells of the first union when the two vessels tied themselves to each other. The rows are like the wake created as two vessels travel the river of life. In one vessel, our canoe, are the laws, traditions and beliefs of our ancestors. In the other vessel, the ship of the white people, are their laws, traditions, and beliefs. Our peoples are not to put a foot in each vessel as they will drift apart and we will fall into the dark waters.

The Two Row Wampum represents the foundation of Haudenosaunee political, social, and spiritual relationship with the Europeans and their descendants. The original treaty agreement between our peoples includes four basic concepts:

- 1. Peace** – The promise to live in peace with each other, and to use reason instead of violence to resolve any conflicts that may arise between our nations.
- 2. Friendship** – The promise to treat each other as family and to help each other as we journey down the river of life together.
- 3. Respect** – The promise not to interfere in each other's affairs. One party will not try to steer the other's vessel on that river of life, meaning that neither nations will try to impose their own laws and government on the other.
- 4. Forever** – The promise to keep the agreement so long as the grass turns green, the rivers flow, and the sun rises in the east.

The use of wampum belts to solicit, secure, and affirm the support of a Native nation in the Northeast was well known and employed by the French, Dutch, and English, as well as the Americans. Purple and white shell beads were woven

into contrasting designs to symbolise the nature of the agreement. Generally peace agreements were represented with a white background upon which purple images were woven. Wampum belts were woven by both the Natives and colonists becoming a unique shared tradition.

Wampum was in use as a diplomatic tool throughout the seventeenth, eighteenth, and early nineteenth century. To the Haudenosaunee and other Native nations along the Niagara Escarpment that used wampum, the various strings and belts of wampum still hold the "word" of their ancestors and the agreements they made. Like many cultural traditions, it can be hard to prove the validity of wampum to precisely record agreements. However, the historic record is full of references to the use of such wampum and colonial leaders, like Benjamin Franklin, marvelled at how accurately Haudenosaunee speakers could recall the specific details of treaties from by-gone eras with much detail and accuracy.

— Rick Hill, *Deyohaha:ge: Indigenous Knowledge Centre, 2013*
[Richard Hill, Oral History, Voices From Here](#)

Royal Proclamation of 1763

The [Royal Proclamation of 1763](#) was issued by King George III on 7 October 1763. The Seven Years' War had concluded with the Treaty of Paris in 1763. The Treaty resulted in vast land transfers to the British and Spanish. The line established by the Royal Proclamation created settlement areas to the south and east of the line, and Indian reserves to the north and west of the line. The line was defined by the headwaters of the Appalachian Mountains. The Proclamation outlawed the private purchase of Indigenous lands. The Royal Proclamation of 1763 is considered the first affirmation by the British Crown of Indigenous rights. However, Anishinaabe law professor John Borrows wrote:

Therefore, the Proclamation illustrates the British government's attempt to exercise sovereignty over First Nations while simultaneously trying to convince First Nations that they would remain separate from European settlers and have their jurisdiction preserved (Borrows 1997, 161).

Algonquin and Nipissing runners ran Wampum strings in the winter of 1763 and 1764, inviting Indigenous First Nations to attend treaty negotiations at Fort Niagara in July of 1764.

Treaty of 1764 (or Treaty of Niagara)

Over 2000 Indigenous representatives from 24 First Nations attended the Treaty councils in July of 1764. The representatives were prepared by their communities to negotiate on the basis of deep cultural traditions, responsibilities to the wellbeing of all life, and rights as Indigenous Peoples. The Treaty provided for an interpretation of the affirmation of Indigenous sovereignties and rights of self-determination. The Treaty incorporated the Covenant Chain, the Dish With One Spoon, and other instruments of Indigenous law. The Treaty provided a framework for future treaty negotiations between the British Crown and Indigenous Nations.

Two-Eyed Seeing and Ethical Space

[Two-Eyed Seeing](#) and [Ethical Space](#) are both concepts used as a means to bridge western science and Indigenous Knowledge, where both systems are seen as equal and respected.

Two-Eyed Seeing promotes using one eye to see the strengths of Indigenous Knowledge, while using the

other eye to see the strengths of mainstream (western) knowledge, and then to use both eyes together when fully 'seeing' the surrounding world.

Elders Albert and Mudena Marshall created the concept of Two-Eyed Seeing / Etuaptmumk (in Mi'kmaq).

Ethical Space refers to creating and maintaining spaces that honour and respect Indigenous ways of knowing, being, and relating to the world. Ethical Space is formed when two societies with disparate world views are poised to engage with each other, creating the space in between them that contributes to the development of a framework for dialogue between human communities. (See 2.3.5 for further details.)

Creating Ethical Space and employing Two-Eyed Seeing is an ongoing process that requires active listening, learning, and a commitment to decolonisation. It is about fostering relationships built on trust and understanding, recognising the agency of Indigenous Peoples, and actively working to undo historical injustices.



Royal Botanical Gardens' Junior Gardeners program has taught a new crop of children to garden each year since 1947. Guided by skilled staff and volunteers, Junior Gardeners grow their life-long attachment to gardening and to nature.

PART II: PERIODIC REVIEW SUMMARY



At Dundas Valley Conservation Area, the Bruce Trail coils through 1,200 acres of land carved out by a succession of glaciers.

1. BIOSPHERE RESERVE



Walkers Line cuts across the shadow of Mount Nemo, an isolated escarpment outlier disconnected from the main escarpment feature due to huge post-glacial rivers.

1. BIOSPHERE RESERVE

1. Biosphere: Niagara Escarpment Biosphere (Biosphere)

1.1 Year Designated: 1990

1.2 Year of first periodic review and of any following periodic review(s): 2002, 2012-2014

1.3 Follow-up actions taken in response to each recommendation from the previous periodic review(s) (if applicable), and if not completed/initiated, please provide justifications.

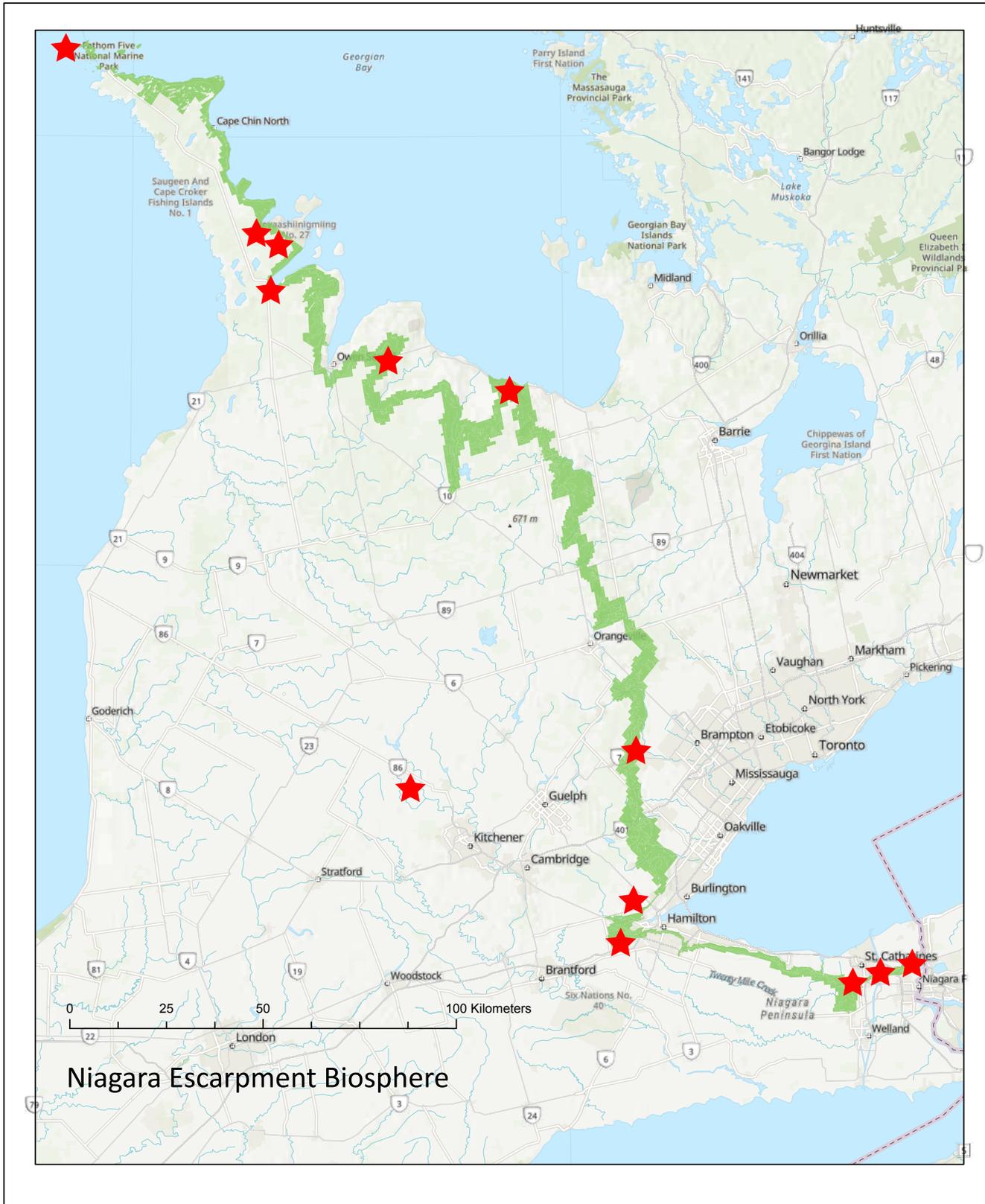
Correspondence following the 2012 periodic review of the Biosphere, under the Commission direction, outlined four recommendations that were resolved to the satisfaction of the UNESCO Man and the Biosphere (MAB) International Coordinating Council (ICC).

Recommendation One: Size of the buffer and transition zones

It was noted in the 2012 periodic review, by the Commission, of the potential for the lands classified under the Niagara Escarpment Plan (NEP 2017) as being within the Escarpment Protection Area to be reconsidered to be a part of the core area in the Biosphere.

Historically, lands classified as Escarpment Protection Areas were designated to be a part of the buffer zone. The Land Use Designation Criteria in the NEP 2017 identified that Escarpment Protection Areas included remaining natural features and the open, rural landscape character of the Escarpment. Escarpment Protection Areas also contained a number of significant natural features and areas, including Regionally Significant Areas of Natural and Scientific Interest and lands designated as environmentally sensitive by regional municipalities or conservation authorities.

Under the advice and recommendations of the MAB-ICC, the Commission continued to identify the Niagara Escarpment Protection Area designations as the buffer zone of the Biosphere. It was suggested in the last periodic review, that the Commission should consider the possibility of extending the Biosphere boundaries outside of the NEP 2017 area to explore cooperation with adjacent watershed authorities. During the last review of the NEP 2017, the Commission consulted with the relevant rights holders, Indigenous communities, private landowners, and adjacent watershed authorities, such as municipalities, park and conservation agencies, on the possible addition of over 40,000 ha to the NEP 2017 area. No area was added to the NEP 2017 due to the lack of support for this proposal at the time. More information on that proposal can be found in 7.7.1.





The eastern chipmunk name comes from Ojibwe word “ajidamoo” which literally translates as “one who descends from trees headlong”.

The Network remains committed to continuing to strengthen the necessary partnerships to effectively explore cooperation to expand the Biosphere boundaries past the NEP 2017 area. Specifically, the Network has committed to walking in the path of reconciliation with the Indigenous voices from Manitoulin Island on their commitment to the Niagara Escarpment. Manitoulin Island, although geographically part of the Niagara Escarpment, is not part of the Biosphere or the NEP 2017 area. The Network recognizes the historical exclusions of these Indigenous communities from the initial discussions on the Biosphere designation, and will continue to build and strengthen relationships with the First Nations communities on Manitoulin Island.

Recommendation Two: Seeking a balanced view on sustainable development

The Biosphere designation was influenced by the vision to reconcile a balance between preservation, conservation and sustainable development within the Escarpment. This

remains the objective of the Biosphere. The 2012 periodic review and recommendations highlighted the need to clearly mark this primary objective to partners at both the local community and institutional level. It was recommended that, to strengthen the public understanding of the potential benefits and linkages a Biosphere designation offers, the Commission should promote a sustainable development function that was based on a balanced vision between human needs and nature conservation. It was also recommended that clarifications on the leadership of sustainable development planning should be made. The Commission remains the primary leader in sustainable land use planning within the Biosphere and retains the legal role of administrator of the NEP.

The Commission and various partners and stakeholders within the Biosphere, succeeding the 2012 periodic review, worked to increase collective participation within the Biosphere through a number of initiatives including the development of a more formal Biosphere reserve network - resulting in the establishment of the Niagara Escarpment



The Town of Tobermory is a perennial favorite, swelling with tourists and cottagers in the summer, while being much quieter in winter months

Biosphere Network. The Commission and the Network continue to work in collaboration with various agencies and communities to achieve a balanced vision between conservation and sustainable development.

The NEP 2017 continues to undergo periodic public review to collectively assess the successes and challenges of sustainable development planning in the Biosphere. The recent review of the NEP provided key opportunities for further strengthening and coordination of a balanced sustainable development perspective.

The Network will continue progress to build a shared vision and understanding of sustainable development in the Biosphere, with our network of partners that is inclusive of Indigenous perspectives.

Recommendation Three: A collective and collaborative network with municipalities, private businesses, public agencies, First Nation communities, NGOs and landowners

During the last periodic review, it was evident that there were powerful environmental bodies and formal organizations committed to conserving, protecting and stewarding the Biosphere. Their leadership in research, conservation, educational outreach and monitoring provided opportunities for further collaboration and collective action. Following the recommendations of the

Council, staff at the Commission initiated the creation of a more formal network of Biosphere practitioners, including First Nations, non-governmental and environmental organizations, universities, colleges, and conservation authorities. This led to the transition to a renewed co-governance network of the Network. See 7.1 for more information on this transition. One of the key opportunities in establishing the Network as a grassroots organization was the creation of a convener organization that provides a forum to encourage new partnerships in the conservation of nature, cultural diversity, sustainable economic and social development in the Biosphere.

Recommendation Four: Increased collaboration between the Niagara Escarpment Biosphere (Biosphere) and national and international Biospheres.

The 2012 periodic review provided knowledge on how collaboration with other Canadian Biospheres and international Biospheres could be beneficial to the Biosphere. Subsequent to the recommendations from the Council, the Commission endeavored to increase participation at the national and international level with other Biospheres. For example, Biosphere representatives attended the 2013 EuroMAB conference, “Engaging our communities”, and piloted the Brand and Story Toolkit (Toolkit) for the Man and Biosphere program. The Commission participated in the Canadian Commission for



Brian Popelier, conservation stewardship officer for the Bruce Trail Conservancy, performs ecological inventories at a BT wetland near Cape Chin. He holds certificates in Ecological Land Classification, bird and plant identification and Ontario Wetland Evaluation.

UNESCO's 54th AGM in 2014, and were invited to attend the 2015 EuroMAB Conference, "Biosphere Reserves: from Heritage to Sustainable Innovation" held in Haapsalu, Estonia where the Toolkit discussions were initiated. Staff also attended and presented the Toolkit at the 4th World Congress of Biosphere Reserves in 2016 and participated developing feedback to the Lima Action Plan with the Canadian delegation, and attended the post-AGM visit to the Clayoquot Sound Biosphere to learn about opportunities to strengthen partnerships with Indigenous communities in the Biosphere.

This led to the initial engagement with the Saugeen Ojibway Nation, First Nations of the Grand River, the Mississaugas of the New Credit and the Great Lakes Metis Council in 2017. The Biosphere participated in the "Brand and Story Toolkit Project", by UNESCO Euro-MAB, that was aimed to create a core brand for world Biospheres to help Biospheres communicate and market their Biosphere locally and helped present the pilot at the 4th World Congress of Biospheres in 2015.

The Network continues to expand its network of partners and create opportunities for collaboration, specifically

with other Biospheres. The Network has led workshops and training on Ethical Space, Two-Eyed Seeing and revisiting Indigenous history in the Biosphere in 2024, and invited Canadian Biospheres to attend. The Network houses the Ethical Space and Two-Eyed Seeing training to be available to any member of the Canadian Biosphere Reserves Association (CBRA). (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) Following the guidance of Canada's Conservation Vision report, the Network is committed to demonstrating leadership in shaping better relationships between Indigenous, non-Indigenous Peoples and nature to achieve reconciliation with one another and the Earth. The Network continues to strive to be a demonstration site for all biospheres in building Ethical Space to forge a path towards living in harmony with Nature. Through the research network, the Network NEBN will continue to engage and build partnerships with researchers and knowledge holders in biospheres across the globe, such as the Yasuní Biosphere Reserve. Similarly, the Network continues to participate in CBRA matters, and offers guidance and capacity building for co-governance systems.



A white trillium shares space and sunlight with a Canada violet. Both species prefer moderate to low light found under the tree canopy of escarpment forests.

1.4 Other observations or comments on the above.

The Canadian Commission for UNESCO (CCUNESCO) rebranded the term “Biosphere Reserve” to “Biosphere Region” in May 2020, after significant review and community consultation. The rationale: in Canada, “Reserve” has a historical association with Indigenous affairs. With many UNESCO Biosphere Regions sites located on the traditional territories of Indigenous communities, there exists an obvious conflict of terminology that can affect the sense of belonging of these communities and thus the change was made.

Reference: CCUNESCO. (2020). The Canadian Network of UNESCO Biosphere Regions Communications Strategy.

1.5 Describe in detail the process by which the current periodic review has been conducted:

The periodic review is the outcome of a decade of ongoing engagement and learning with the partners and communities of the Biosphere, conducted by the Commission from 2012-2019 and the Niagara Escarpment Biosphere Network (Network) from 2020-2023. During this time, the Commission and Network have focused on various strategies of engagement in order to achieve a holistic understanding of the varied interests and perspectives towards sustainable development, nature and biodiversity conservation, and challenges faced in the Biosphere.

During 2012-2019, the Commission held many engagement and consultation sessions with Indigenous and non-Indigenous communities across the Biosphere to assess the governance needs of the Biosphere. These consultation sessions are described in more detail in section 2.1. The aim of these engagements was to ensure that a diverse and well balanced representation of the communities across the Biosphere was listened to and that Indigenous voices were uplifted. Plenty Canada, an Indigenous-led environmental conservation organization, paved the way for Ethical Space to be created so honest and meaningful engagement could occur. Plenty Canada continues to forge this path in partnership with the Network.

In 2013, in collaboration with the Ministry of Natural Resources and Forestry (MNRF), the Commission facilitated and sponsored the Leading Edge Conference. This event brought together over two hundred participants representing the diversity of the Biosphere, with the purpose of providing partners with the opportunity to network and share knowledge that furthered the understanding of the Biosphere. During the conference, the Commission shared the lessons learned and summary of the 2012 periodic review of the Biosphere and commenced dialogue on various topics, such as sustainable development challenges and successes for the next periodic review.

Much of the initial engagement with partners conducted by the Transitional Leadership Committee of the Network

occurred during the COVID-19 pandemic, hampering the commencement of the periodic review process for the Network. In observance of public health guidelines and an understanding of the 725 km Biosphere range of our partners, the Network created a balance of online and in person events for the subsequent gatherings or workshops. The review process included creating an updated contact list of all conservation, sustainable development, agricultural organizations, green businesses, educational centers, and First Nations rights holders across the Biosphere. An updated scan and list of partners across the Biosphere was essential to the Network to ensure that all partners of every sector were invited and included to participate in all meetings and workshops. The Network newsletter was also sent to the 1400 contacts on our partner list on a seasonal basis, and partners were introduced to the upcoming periodic review and encouraged to share their organizational information and stories to be shared in our self study (See Annex IV).

Questionnaires and surveys were developed and sent to partners via the newsletter and general networking to gather information on the work being done across the Biosphere. In addition, an important step for the network and the periodic review process was the creation and development of the Research Network, a forum created for traditional knowledge holders, academic institutions, conservation and educational organizations to come together in the spirit of knowledge sharing and collaboration. Table 2.4.6 describes the Network Research Network in more detail. Members of the Research Network were surveyed on their research projects within the Biosphere and asked to share their data for the periodic review. Engagement with Conservation Ontario and Conservation Authorities, the Commission and Municipal governments to create sound partnerships and letters of support for the Biosphere also occurred during the process of review. See [Network Additional Resources](#).

1.5.3 How many meetings, workshops, etc. occurred throughout the process of conducting this review?

The review process consisted of events such as:

- The Network Launch at Brown Homestead
- The Network Launch in Neyaashiinigiing
- Celebrations of Nations in St. Catharine's in 2021, 2022 and 2023

- A four day Bioblitz across the Biosphere and creation of Biosphere project site on iNaturalist to track biodiversity across the Biosphere
- Meetings with the Network Research Network
- Network Annual General Meeting (See 7.5.6 for question breakdown and participant analysis)
- Updating zonation maps in consultation with partners such as Escarpment Corridor Alliance and Escarpment Biosphere Conservancy
- Presentations to students at Niagara College and Brock University

1.5.4 Were they well attended, with full and balanced representation? (Describe participation and stakeholders).

The periodic review process meetings, workshops, presentations, general consultations and more have been inclusive and well attended. The Network has prioritized diverse representation across partner groups and sectors. The engagement strategies such as, online and in-person events, surveys, newsletters and consultations, encouraged participation from partners. As well as contributed to developing a shared comprehensive understanding of perspective and interests related to sustainable development and biodiversity conservation.

2. SIGNIFICANT CHANGES IN THE BIOSPHERE RESERVE DURING THE PAST TEN YEARS

2. SIGNIFICANT CHANGES IN THE BIOSPHERE RESERVE DURING THE PAST TEN YEARS

2.1 Summary overview

Until 2019, the Commission was the lead convener for the Niagara Escarpment Biosphere. Biosphere conveners are responsible to develop, implement, manage, and coordinate initiatives between various stakeholders. The 2012 UNESCO review of the Biosphere recommended a more balanced governance model, not the singular leadership of a government agency, to have a greater role in overseeing the Niagara Escarpment Biosphere. In response to this recommendation the Commission increased its engagement with the local Biosphere communities and international Biosphere communities to identify the best resolution to the recommendation.

In 2015, representatives from biospheres across the world, including members of CCUNESCO MAB Committee, Niagara Escarpment Commission Director, Deb Pella Keen and current Executive Director of Plenty Canada, Larry McDermott, attended the 4th World Congress of Biosphere Reserves. At this congress the [Lima Action Plan](#), (2016-2025) of the World Network of Biosphere Reserves was drafted. However, the only Indigenous delegate from Canada was Larry McDermott. On the first day, meetings were set up based on the five global regions of UNESCO. The Canadian delegation attended EuroMAB. At the first meeting, a member of the German delegation advocated for the separation of western science and Indigenous Knowledge Systems, declaring the superiority of western science. Mr. McDermott rose and was acknowledged by the Chair, and raised the point that there was no hierarchy of knowledge systems within the UN Multilateral Environmental Agreements (MEAs) on climate change, biodiversity, and desertification. Therefore, it would require a resolution by the UN General Assembly to dismantle the respectful relationship of Ways of Knowing that are essential to the successful implementation of associated work plans.

During the Congress, Larry McDermott presented a slideshow titled [“Building Biosphere Capacity to Achieve Sustainable Development Goals Through Indigenous Partnerships”](#).

World Biosphere Congress leadership gave Mr. McDermott 24 hours to suggest amendments to the draft Lima Plan. Mr. McDermott invited the entire Canadian delegation of Biosphere representatives to join him in that process, recognizing the opportunity to build capacity in Canada for Two-Eyed Seeing and Ethical Space. (See Section L and 2.3.5 for further details.) Together the delegation created suggestions for making the Lima Plan more in line with the UN MEAs and principles of cooperation among diverse Knowledge Keepers. The drafting committee approved many of the suggestions, but not all of them.

At the final plenary, Mr. McDermott was invited to speak on behalf of Indigenous Peoples about Indigenous perspectives and Biospheres and the potential held by mutual cooperation in achieving the critically important Biosphere goals and objectives.

Upon return from the Congress meetings, the Director of the Commission, Deb Pella Keen was inspired to seek advice on how the Niagara Escarpment Biosphere could improve its relationship with Indigenous Peoples. Plenty Canada was contacted and the team of Mr. Tim Johnson, former acting director of the Smithsonian Museum of the American Indian and Senior Editor of Indian Country Today, and Larry McDermott, Executive Director of Plenty Canada, put together a proposal titled “Working Together for a Better World Building Respectful Relationships with Indigenous Peoples in the Niagara Escarpment Biosphere Reserve”.

“There is an emerging need and tremendous opportunity for Indigenous Peoples, community groups, and governments to bring their respective strengths together in collaborative efforts that work effectively across cultures and knowledge systems to address the most pressing issues of our time”.

“This opportunity to respond inclusively to achieve the UN Sustainable Development Goals (SDGs) and Multilateral Environmental Agreements (MEAs) as guided by the United Nations Declaration on the Rights of Indigenous Peoples and the Lima Plan for MAB will not be easy.”

Meetings were held among the Haudenosaunee at Six Nations and Anishinaabek Nations at Tobermory. A common theme was that Canadian conservation efforts had a negative history with Indigenous Peoples. The recommendations were for Indigenous Peoples to find a project centred around reestablishing Indigenous voice. In the process of implementing such a project, the hope was that trust could be rebuilt. The Niagara Escarpment Biosphere representatives had proposed a governance

system where a couple of Indigenous people would sit with others who are stakeholders, not rights holders, as understood and expressed in the United Nations Declaration of the Rights of Indigenous Peoples. Both the Haudenosaunee and the Anishinaabek representatives at these meetings expressed a similar view of this path forward.

Second Opinion

There was a change in staff at the Director level at the Commission. The new Director sought a second opinion regarding the Niagara Escarpment Biosphere's role in environmental protection through enhanced community engagement. The consultation and subsequent report indicated very little Indigenous engagement. In fact, monies originally budgeted to include Indigenous Peoples went largely unspent.

The team of Larry McDermott, Algonquin, and Tim Johnson, Mohawk, wrote a letter signed by Mr. McDermott outlining in detail their concerns that additional funds were being spent on community engagement involving the Indigenous Peoples of the Niagara Escarpment Biosphere.

To review the letter, see [Additional Resources Annex](#).

Consultation Process and Key Findings

The consultants established two working meetings and a survey with potential rights holders and stakeholders.

There was a meeting on July 30, 2019, attended by 41 people. At this meeting, it was identified as a priority to clearly articulate the new purpose of the Biosphere. To address this, a group exercise was undertaken at the September 24 workshop attended by 23 individuals, which focused on two related questions:

- What will the next version of the Biosphere focus on?
- Where should limited resources go?

To see the results of the meetings and the recommendations developed, refer to Annex III.

A process involving individual reflection, working in pairs, and tabulating each pair's most cogent ideas resulted in 11 themes - see below. While there was insufficient time to word-smith these ideas into tightly worded statements, these materials became useful ingredients for the Transitional Leadership Committee, supported by its Working Groups, to formulate powerful mission, vision, and values statements and to define strategic priorities for the new organization.



The massive outlier at Rattlesnake Point Conservation Area is separated from the main body of the Escarpment by the steeply cut Nassagaweya Canyon.

1. Co-management:

- Indigenous co-development
- A regional intersection of global goals through Indigenous land management and leadership (ie. Land Guardians)
- Reconciliation
- Improve meaningful Indigenous relationship-building
- Integrate Indigenous communities within Biosphere

2. Network convening and knowledge exchange:

- Connecting and convening initiatives across bioregion
- Connect organizations doing Biosphere work to share information and experience
- Connect groups
- Education other Niagara Escarpment organizations on how they can support process

3. Ecosystem services:

- Share evidence of ecosystem health/function in Biosphere
- Recognize the value that nature brings to the economy

4. External communications and collaboration:

- Celebrate and encourage collaboration and engagement
- Build a constituency of support
- Share success stories
- Communication with public and stakeholders
- Be a conduit for posting of stories, research papers, local volunteer opportunities and events

5. An evidence-based organization:

- Values of both traditional Indigenous and western academic science
- Collaboration and study

6. Building capacity of regional organizations:

- Regional organizational capacity builder for local groups
- Add capacity to member organizations
- Act as formal linkage to all Niagara Escarpment interests

7. Biosphere protection, renewal and enhancement:

- Protect the Niagara Escarpment for future generations
- Protect and enhance the Niagara Escarpment Parks and Open Space System (NEPOSS)
- Environmental protection
- Environmental preservation and renewal
- Environmental enhancements
- Biosphere development
- Promote preservation and stewardship

- Manage trees
- Improve measures to safeguard endangered species

8. Public education and awareness:

- Explain to the public what UNESCO designation means
- Educational initiatives: promoting knowledge of the Biosphere
- Education

9. Designation renewal and strengthening:

- Renew and secure UNESCO Biosphere designation
- Review and maintain Biosphere designation

10. Inspiring change:

- Challenge status quo
- Influence land use planning/land management stewardship activities
- Advocate for responsible use

11. Global presence:

- Connect Biosphere to global network

In 2019, a Transitional Leadership Committee (TLC) composed of four volunteers was selected to guide the formation of the new non-profit organization. The time needed to develop relationships with Indigenous and First Nations representatives could not be rushed. Outreach to other stakeholders and the development of mechanisms to engage other key sectors such as local government, agricultural interests, environmental NGOs, or tourism businesses was postponed until the co-governance approach could be meaningfully established. The work of the Transitional Leadership Committee was significantly impacted by the sudden onset of the COVID crisis in early 2020. Face to face meetings were not possible and thus it wasn't until 2021 that the Transitional Leadership Committee entered into a Memorandum of Agreement with Plenty Canada as a result of Plenty Canada's historical knowledge on the challenge of governance in the Biosphere and pre-existing trusted relationships both within the extended UNESCO community and First Nations within the Biosphere.

In March 2022, the Niagara Escarpment Biosphere Network was officially incorporated and launched. The first board of nine members included three Indigenous members. At the subsequent Annual Meeting, Indigenous representation increased to five out of twelve board members. The articulation of the Network governing principles and dedication to co-development reflects our commitment to continuing to evolve the model. In this model, Indigenous

perspectives are designed to be integrated in the core decision-making and leadership of the organization and not set up as merely an advisory body to it. Currently we operate with co-chairs of the board, one of whom is Indigenous and a hereditary council member from her community within the Escarpment. See 7.1 for more on our transition story of the Network.

Lima Action Plan for UNESCO’s Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves

As outlined in the Lima Action Plan (2016-2025):

“The MAB Strategy foresees that, in the coming 10 years, the MAB Programme will concentrate its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources; contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony with the Biosphere; facilitating biodiversity and sustainability science, education for sustainable

development and capacity building; and supporting mitigation and adaptation to climate change and other aspects of global environmental change.

“In line with its vision and mission statement, the Lima Action Plan places strong emphasis on thriving societies in harmony with the Biosphere for the achievement of the Sustainable Development Goals and implementation of the 2030 Agenda for Sustainable Development, both within Biosphere reserves and beyond, through the global dissemination of the models of sustainability developed in Biosphere reserves.

“Using the MAB Strategy 2015-2025 and Lima Action Plan 2016-2025 as the key points of reference, MAB National Committees and MAB networks are strongly encouraged to prepare their own strategies and action plans. These should be founded in national and regional realities and imperatives and will contribute both to addressing these and to implementing the Lima Action Plan at the global level (Man and Biosphere Program, 2016).”



Karl Dockstader directs an Indigenous circle during “Celebrate Our Nations”, an interactive Indigenous education experience for 400 Niagara students at Queenston Heights.

The CCUNESCO commitment to reconciliation, mindful of UNDRIP, the Truth and Reconciliation's 94 Calls to Action, and Ethical Space, guide the Niagara Escarpment Biosphere Network in developing its system of governance, strategic priority setting, standards of inclusivity, respect for both Indigenous Knowledge Systems and western science, along with the sharing of responsibilities of implementation, monitoring, and evaluation of all MAB activities.

Co-governance of Network

Responding to the Lima Plan, conservation leadership in Canada, especially Pathways 1, established a co-governance model for western and Indigenous Ways of Knowing. Pathways 1 produced recommendations from

the Indigenous Circle of Experts and the National Advisory Panel in their reports "[We Rise Together](#)" and "[Canada's Conservation Vision](#)". Key recommendations acknowledged the importance of conservation initiatives being based on reconciliation and in Ethical Space. (See Section L and 2.3.5 for further details on Ethical Space.)

The Network, starting with the Transitional Leadership Committee, which embraced recommendations from the 2017 Plenty Canada report and Pathways 1, set in motion a process of establishing significant Indigenous membership on the board and policy establishing an Indigenous and non-Indigenous co-chair. Training to assist rights holders and stakeholders in building the capacity to effectively operate co-governance systems based in Ethical Space was organized by the Network in partnership with Mohawk College and Plenty Canada. Over two hundred and ninety attendees from numerous conservation, environmental, Canadian Biosphere representatives and Indigenous organizations packed The Gathering Place conference centre in Six Nations of the Grand River to gain training insights into Two-Eyed Seeing and Ethical Space in relation to the challenges presented by climate change. The event delivered a stellar line-up of Indigenous elders and scientists (not mutually exclusive), and technical specialists who worked in a number of fields to mitigate and reverse the impacts of climate change.

This gathering explored the ways in which Indigenous principles can and are being used to develop responses to the impacts of climate change including environmental shifts in seasons and cycles, extreme weather events, physical and mental health, food production, and more. The conference goal was to create Ethical Space for the engagement of ideas and inspiration as we begin to face the new ecological scenario created by Climate Change. Topics featured included Two-Eyed Seeing and Ethical

Space, Natural Law and Cultural Prophecy, Wampum Law, Governance, and Reconciliation, Indigenous Food Security, Net-Zero Energy Building, Honouring Water, and Two-Eyed Seeing Bird Knowledge among many other approaches.

Each day began with cultural presentations designed to focus minds and hearts on the work. Elder Kevin Deer, from Kahnawake Mohawk Territory and the Director of Indigenous Knowledge Quality Learning and Teaching Excellence at First Nations Technical Institute, opened Day One delivering an explanation of the Haudenosaunee Thanksgiving Address, followed by Craig Abotossaway giving a short reflection on the Seven Sacred Gifts. On Day Two Elder Josh Eshkawkogan, a pipe carrier, sweat lodge conductor, and orator from the Wikwemikoong Unceded Indian Reserve, conducted a Pipe Ceremony.

Present among the Indigenous leaders headlining sessions were Mi'kmaw Elder Albert Marshall (the Co-founder of the Two-Eyed Seeing philosophy), Shabot Obaadjiwan Elder Larry McDermott (Executive Director of Plenty Canada), Mohawk Elder Roronhiakewen Dr. Dan Longboat (Trent University Director of Indigenous Environmental Studies), Tuscarora Elder Rick Hill (Indigenous Innovations Specialist at Mohawk College), Onondaga Elder Oren Lyons (Faithkeeper and a principal figure in the development of the United Nations Declaration on the Rights of Indigenous Peoples), Shawanaga First Nation Elder Marilyn Capreol, and Charlene Winger-Jones (Hereditary Council member, Water Walker, and Co-chair of the Niagara Escarpment Biosphere Network). In addition, Mohawk Elder Tim Johnson (Senior Advisor to Plenty Canada, Niagara Parks, and the Royal Ontario Museum) and Seneca Elder Scientist Henry Lickers (Environmental Science Officer for the Mohawk Council and International Joint Commission) provided an orientation on the history of Indigenous engagement with climate change and science-based actions underway on both sides of the international border, respectively.

A variety of fascinating sessions offered a broad range of information and perspectives on how to assess and deal with the crucial, and some would say existential, crisis of climate change impacting the health and well-being of future generations. A conversation between Dr. Sarah Burch, Executive Director, Waterloo Climate Institute and Lead Author of the United Nations' Sixth Assessment Report of the Intergovernmental Panel on Climate Change, and Katherine Flynn from the Mohawk College Centre for Climate Change Management, examined the scientific evidence and projected impacts of Climate Change.

There were other exciting sessions that approached the topic through unique approaches that adhered to the conference's main concept. For example, the leaders from four different bird-related research projects spoke about their progress, challenges, and experiences while incorporating Two-Eyed Seeing into their methodologies. In a highly engaging and entertaining session that included youth participation, entitled United Nations Sustainable Development Goals and Food Security, Jessica McLaughlin (Anishinaabe from Long Lake #58 First Nation) and Rosie Kerr (Post-doctoral fellow in the Sustainable Food System's Lab, Lakehead University) reviewed how food sovereignty is the right of people to have access to healthy culturally appropriate foods, to grow and harvest foods produced through sustainable and ecologically sound methods, and for communities to define their own food systems. The purpose of their effort seeks to Identify, develop, and share civil society and Indigenous food system best practices along with policy analysis to address gaps in knowledge and data to advance a number of Sustainable Development Goals (SDGs).

A practical demonstration on what individuals and organizations can do to greatly reduce or even eliminate their carbon emissions was featured in the session dealing with Net-Zero Energy Building and Honouring the Water. Garrett Johnson (Researcher with IDEAWORKS at Mohawk

College) and Tony Cupido (Professional Engineer and Ph.D. with 37 years of experience in engineering, facilities management and capital development) conducted a program opened by Charlene Winger-Jones that detailed Plenty Canada's rehabilitation of its Lanark, Ontario offices using innovative technologies that make efficient use of rain water while reducing and treating waste water through natural systems, and the application of solar energy applications that have made the organization's CampUs energy negative.

Capping off the event was a moving session involving a significant and substantial group of youth who served as respondents to the conference program. Led by Mohawk Doctoral Candidate Abraham Francis, whose work specializes in the intersections between Indigenous and scientific knowledge, each of the youth presented their observations and experiences on what they saw as a way forward. The substance, tone, and tenor of their remarks had a tremendous impact upon those attending the conference. An artist from Six Nations created graphic summary of the discussions and conversation that occurred throughout the event.

As the cultural landscape of the Biosphere changes, there have also been significant changes to the population within the Biosphere boundaries.



Major Population Growth

Over the last ten years, there was a steady increase in population growth within the boundaries of the Biosphere. There has been a significant increase in the housing development demand in the overlapping Biosphere, Greenbelt, and Golden Horseshoe areas due to rapid population growth. These regions now contain the most densely populated municipalities in Ontario. The rapid population growth continues to strain resources and land demand, as the growth is estimated to continue to 14 million by 2051 in the Greater Golden Horseshoe Area.

This significant demand for housing has created a housing affordability crisis faced by many Ontarians today. The high proximity of the increased population to the Biosphere has also resulted in a strain on some of the delicate natural areas as a source of tourism and recreation. Since the COVID-19 pandemic, a significant increase of people utilizing green spaces such as the Bruce Trail has been observed. The Bruce Trail Conservancy estimates 400,000 people walk on the trail running throughout the Biosphere every year.

Population growth in urban and rural areas that contain Biosphere buffer zones adjacent to the Escarpment catalyzes the conversion of agricultural land and leads to housing starts, demand for the products of quarrying/aggregate, increased transportation, and other economic activity with attendant urban environmental effects such as heat islands, air pollution, stormwater run-off, and the like.

As the province continues to plan on the best course of action for intervening on the housing crisis faced in Southern Ontario, there is a need for the Commission to continue to maintain the balance of sustainable development and conservation within the Biosphere. Population growth brings land use changes which are generally more intensive and feature less forested or open landscapes which are amenable to wildlife habitat and diversity. Many organizations within the Biosphere have worked to protect the biodiversity and sensitive ecosystems in the Biosphere from the increased pressure of population growth through contributing to Canada's Target 1.

Greenbelt, Conservation Ontario, Ontario Nature – the Municipal Protected Area Project

With support from the Greenbelt Foundation, Ontario Nature is collaborating with Conservation Ontario to contribute to Canada's Target 1 of protecting 25% of lands and waters by 2025 and 30% by 2030. The organizations are engaging municipalities and Conservation Authorities (CAs) in the Greater Golden Horseshoe (GGH) to assess

environmentally significant lands against Canada's protected areas standard. Lands meeting the standard will count towards the federal target. Working with five municipalities and four CAs, Ontario Nature has worked with many partners assessing land, finding that many meet the national protected areas standard, ranging from urban parks to rare ecosystems on the Biosphere, Greenbelt, and Oak Ridges Moraine.

Protected Area Gains in the Biosphere since 2012

Since 2012, approximately 8,239 hectares of land, totaling 181 properties within the Biosphere, have been protected. This includes 4,160 hectares of land within the existing NEPOSS and 4,079 hectares of land not currently part of NEPOSS. The main landowner agencies include Bruce Trail Conservancy (BTC), Escarpment Biosphere Conservancy, Conservation Authorities, Nature Conservancy of Canada, Ontario Heritage Trust, Ministry of Natural Resources and Forestry, and private landowners.

To date, eighty-four Bruce Trail Conservancy protected natural areas have qualified to be included in the Canadian Protected and Conserved Areas Database to track meeting Canada's Target 1 goal.

The Bruce Trail Conservancy and the Escarpment Biosphere Conservancy have respectively provided their land securement achievements in Annex IV and Annex V.

Background on global biodiversity goals and Canada's commitment

In 2010, the Conference of the Parties for the United Nations Convention on Biological Diversity adopted a Strategic Plan for Biodiversity. This plan outlined 20 global biodiversity targets, known as Aichi Targets, to be achieved by 2020. Aichi Target 11 emphasized the importance of Protected and Conserved Areas in terrestrial, marine, and freshwater ecosystems, aiming for the conservation of at least 17% of terrestrial and inland water and 10% of coastal and marine areas by 2020.

In response to Aichi Target 11, Canada initiated the Pathway Initiative, focusing on terrestrial and inland waters. In 2016, federal, provincial, and territorial ministers agreed to establish a working group to develop a plan for contributing to Target 11. The One with Nature report provided guidance, incorporating recommendations from an Indigenous Circle of Experts and a National Advisory Panel.

In 2018, ministers committed to safeguarding Canada's biodiversity by improving networks of protected and

conserved areas. They pledged to work with Indigenous Peoples, share jurisdictional plans for these areas, and reconvene in 2019 to assess progress. Simultaneously, the Aichi Biodiversity Targets underwent a 10-year review, revealing partial achievement in six areas. This prompted renewed commitment from Canada in the 2020 Speech from the Throne, setting a target to protect 25% of Canada's land and oceans by 2025.

By the end of 2022, Canada had conserved 13.6% of its land and freshwater, including 12.7% in Protected Areas and nearly 1% in Other Effective Area-Based Conservation Measures (OECMs). Global collaboration culminated in the December 2022 Global Biodiversity Framework, where the target was increased to 30% by 2030. This new Target 3 emphasizes effective conservation and management of terrestrial, inland water, and coastal/marine areas, respecting Indigenous and traditional territories and integrating into broader landscapes, seascapes, and the ocean.

My Water Walk Through Time

Throughout the last ten years, the landscape and appearance of the Biosphere has changed. The co-chair of the Network, Charlene Winger-Jones, an Anishinaabekwe elder and water walker from Neyaashiinigiing (Land Surrounded By Water), has walked the entire Bruce Trail as part of her responsibilities as a water walker. The Bruce Trail traces the entire span of the Biosphere's boundaries from start to finish, approximately 890 kilometers. Charlene shares her reflections from her water walk, as an example of the changes in landscape and appearance of the Biosphere that she saw.

My Water Walk Through Time took 35 days. We walked from Niagara Falls all the way to Tobermory. The big changes from the southern tip of the Biosphere going north, the devastation in Southern Ontario from corporations, steel companies, those things are devastating the air and the land. Walking through Hamilton, you can see pipes and emissions, gravel pits along Huron, and the damage they're causing there. It's disheartening to see because when you're walking the Bruce Trail you'll see them trying to hide gravel pits with trees, and when you go through the bush the trees drop off into gravel pits. When we started the walk, we were unable to get good, clean water and had to use filter systems until we got past Guelph.

Within the territory, people aren't realizing the changes being made. People aren't seeing the devastation happening all along the Bruce Trail. Mark Zelinski's presentation on Manitoulin Island was a real eye-opener

for the people there and I hope the Network can do more of these presentations along the Bruce Trail to let people know that the Bruce Trail isn't safe. Up in Tobermory, many people are building large cottages, and it's affecting everything that's growing there. Councilors are allowing this to happen because they need the money from tourism. All these changes along the Bruce Trail are occurring because of tourism. I've seen these changes because I've walked the Trail. During my Walk, I met people along the Trail who wanted to know what we were doing and how they could help, while other people didn't even want us walking along their property, worried about protecting their material possessions instead of the Bruce Trail.

I didn't realize how beautiful the Trail was until I walked the whole thing. This Earth that we're living and walking on is important and has life, and as First Nations we understand that life. Everyone has this understanding, even if they don't realize it, because when you're walking on the Bruce Trail and you see something, you just stand there and sigh at the beauty of it. The Bruce Trail creates that. The Niagara Escarpment creates that. The waterfalls around the Hamilton area are breathtaking.

When you walk along the Bruce Trail you can tell who isn't looking after their sections and who is. There was a lot of garbage in some sections, and when I see litter in the parks near my home I wonder "Who is supposed to be looking after this?" It's us, we have to look after it. All the things I saw walking along the Bruce Trail, how the people were, and how the environment is, left me in awe of the whole Trail itself, especially seeing it from end to end. I saw endangered species we need to look after and trees that shouldn't be there. On my last little walk on Tobermory, I saw all the construction going on up there, and heard people complaining about the bears getting into the garbage, but that construction is interfering with the bear paths that have been there this whole time. They don't understand that their cottages are interfering with nature and the natural way of things in the area, and getting rid of white cedars and bears will only cause more damage. Tourism and corporations are causing damage that you can see walking along the Bruce Trail. Farms growing fields and fields of corn and soybeans is not how farms should be. A farm should be someone growing the food they need to survive, not acres and acres of the same thing.

Not everything is bad on this Earth, we get to see beautiful things, and many people are doing wonderful work to take care of the Bruce Trail so there's hope for us all. We can't rush to find solutions, we should take our time to find the best way, not the quickest way.

The future of the Biosphere

The role of the Network in responding to the changes in the landscape witnessed over the last ten years within the Biosphere must reflect its organizational capacity, the jurisdictional context, and the continuing authority of the Commission for land use planning on the Escarpment, as well as the activities of other conservation organizations on the Escarpment. Unlike many other Biospheres, there is a well developed institutional and legislative context aimed at the conservation of the Escarpment. We will not be duplicating that work nor would the Network be capable of it. As the name Network implies, the Network is not directly responsible for managing land, purchasing land, approving or rejecting development proposals or intervening in these processes. What the Network sees its role as is celebrating successes, encouraging good practices, transferring lessons learned, highlighting examples of projects or stimulating demonstration projects which achieve conservation objectives and sustainability.

There are many sectors to engage and we are only beginning to have the discussions which will confirm or reorient our activities to those which are most beneficial. For example, there are multiple large land trusts focussed on protecting Escarpment lands as well as many locally oriented NGOs and regional watershed based Conservation Authorities at work. We foresee local governments as important allies in building awareness of the Biosphere designation and its values. Given the educational and research actors and the cultural, agricultural, and sustainable tourism interests at play there are many linkages that can be made. It is a diverse, rich, and complex environment in which we are working and we are a new player in it.

The Network sees its role as convening dialogue for informed, constructive debate about how effective conservation measures are and how they might be improved. Re-energizing monitoring regimes and creating venues for the sharing of scientific information and effective approaches is something that suits our networking role. Ideas such as the re-establishment of an annual conference or symposium are among the possibilities we will be pursuing. Even as we undertake this work our key priority is addressing our capacity challenges.

2.2 Updated background information

2.2.1 Updated coordinates (if applicable). If any changes in the Biosphere reserve's standard geographical coordinates, please provide them here (all projected under WGS 84):

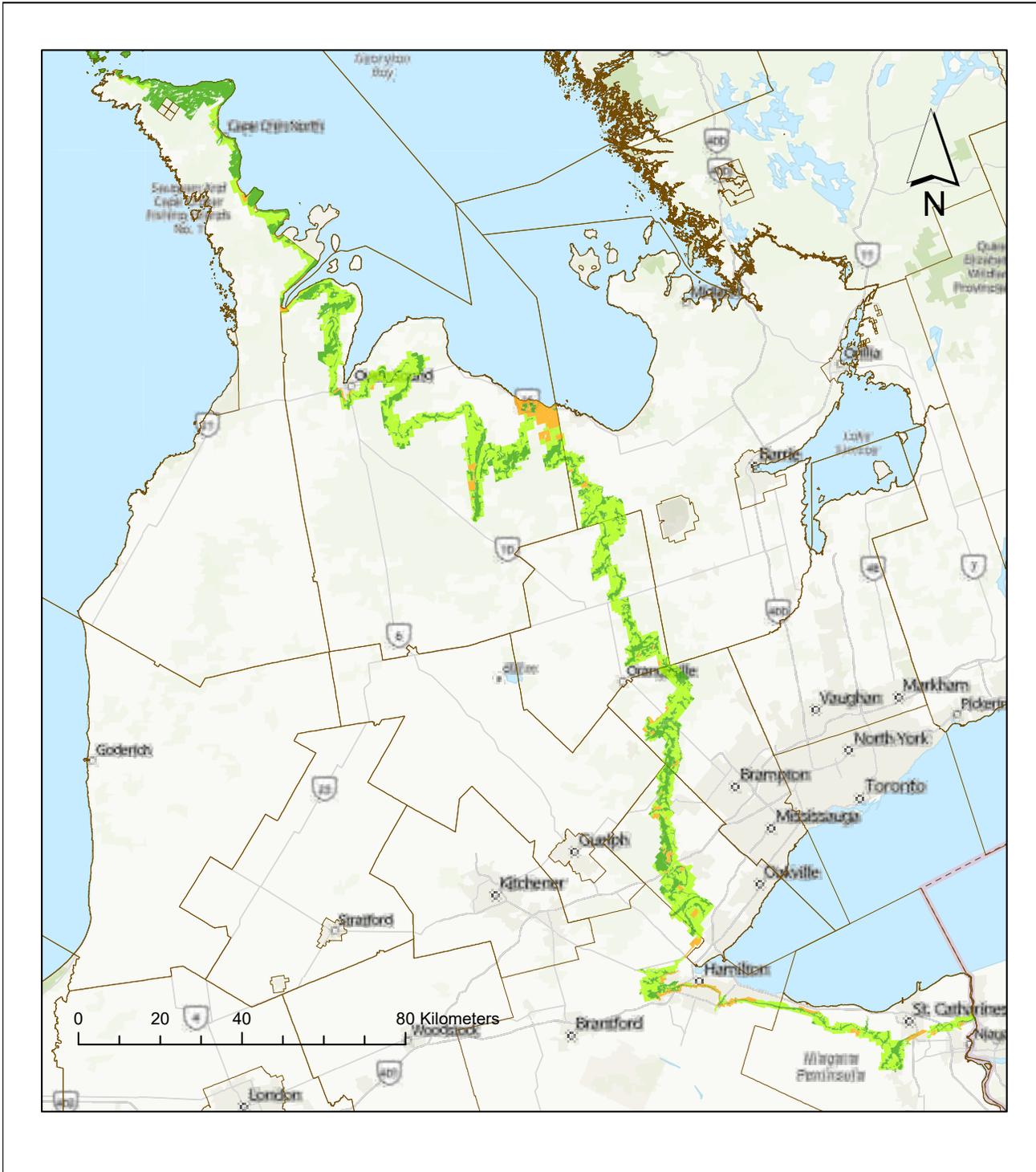
The coordinates of the Biosphere remain the same.

Cardinal points:	Latitude	Longitude
Northernmost point:	45°32' N	
Southernmost point:	43 °05' N	
Westernmost point:		71 °05' W
Easternmost point:		81°77' 'W

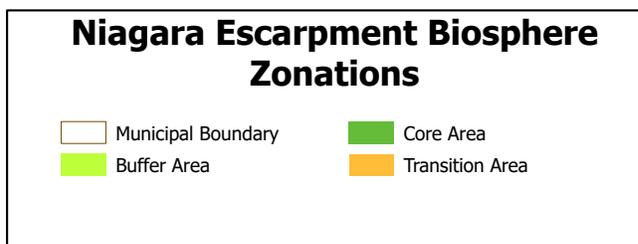
Spatial configuration: North end (Tobermory): 45° 15' N 81° 40' W South end (Niagara Falls) 43° 8'N 79° 5' W.

2.2.2 If necessary, provide an updated map on a topographic layer of the precise location and delimitation of the three zones of the Biosphere reserve. Map(s) shall be provided in both paper and electronic copies. Shape files (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form. If applicable, also provide a link to access this map on the internet (e.g. Google map, website).

As described above, the coordinates of the Biosphere remain the same.



Niagara Escarpment Biosphere



2.2.3 Changes in the human population of the Biosphere reserve.

The Biosphere consists of 31 upper and lower tiers of municipalities within its boundaries. Based on data from Statistics Canada, the total population of the combined municipalities within the boundaries of the Biosphere is 1,488,169 (See table in section J). From the last periodic review, this is a 13% increase in the total population within the Biosphere. The 2021 census data revealed the greatest increases in population were seen in Milton, The Blue Mountains and Thorold. The rapid population growth of 58% from 2011 until 2021 in Milton is consistent with the growing development demand that is seen throughout the Biosphere and Greenbelt.

2.2.4 Update on the conservation function, including main changes since last report.

The Biosphere stands out as the region with the greatest topographic variability in southern Ontario, offering diverse habitats spanning over 430 meters in elevation. From Great Lakes coastlines to cliff edges, talus slopes, wetlands, woodlands, limestone alvar pavements, oak savannas, and conifer swamps, the Biosphere hosts a rich

array of habitats. Among the Biosphere's crucial habitats is the Ancient Cedar Forest, home to eastern white cedars over 1,000 years old. Additionally, remnants of tallgrass prairies in Hamilton and Niagara regions, dependent on fire, support a diverse array of plant, bird, and insect species. Globally rare alvars, limestone pavements with minimal soil, found on the northern Bruce Peninsula, host unique and endangered species like Lakeside Daisy and Eastern Loggerhead Shrike.

However, the conservation function of the Biosphere faces challenges due to significant population growth and incomplete land use planning to address rising pressures on the Escarpment.

The cumulative impact of multiple stressors poses threats to the environment, including habitat and biodiversity loss, invasive species, and habitat fragmentation. Land subdivision for housing, roads, and agriculture leads to the isolation and loss of animal habitats, affecting biodiversity negatively.

On a positive note, wetlands cover 9% and woodlands cover 49% of the entire Biosphere. Environment and Climate Change Canada (ECCC) recommends having at least 50%



First run in 1894, the Around the Bay Road Race is the oldest on the continent, a challenging 30km footrace around Hamilton's natural harbor.

forest cover in a region in order to have a low-risk approach to supporting the habitat of most species. Likewise, it recommends having 10% of each major watershed or 40% of the historical watershed wetland coverage protected and restored. Although the Biosphere is close to meeting ECCO How Much Habitat is Enough targets, there is more work to be done and Conservation Authorities are well positioned to lead the charge for natural heritage conservation.

All seven Conservation Authorities in the Biosphere have rigorous watershed monitoring and evaluation programs. Watershed report cards provide comprehensive assessments of environmental indicators, offering a snapshot of the watershed's overall well-being. Watershed report cards date back to the establishment of the program in 2007 and are repeated every five years offering consistent data for comparative purposes. Most Conservation Authorities (CAs) monitor forest and wetland cover. Looking at Credit Valley Conservation (CVC) as an example, they have produced watershed report cards every five years since 2007, this allows benchmarking and comparisons of environmental parameters. With most of the Biosphere in their upper watershed, this is a valuable monitoring tool. For example, in the last 14 years, CVC has restored more than six kilometres of stream and shoreline, 12 hectares of wetland habitat and controlled invasive species across 329 hectares of terrestrial and aquatic habitat. Collectively, Conservation Authorities (CAs) planted approximately 2 million trees across Ontario's watersheds in 2022. They also continued to map and monitor local forest cover. CA tree planting and habitat restoration and rehabilitation projects are delivered in partnership with agencies, local businesses, nurseries, and landowners, which allows the leveraging of resources, resulting in broader benefits and impacts. CAs worked closely with many of these partners, including Forests Ontario, to deliver the Federal government's 2 Billion Trees Program.

2.2.5 Update on the development function, including main changes since last report.

The NEP is reviewed, amended, and renewed on a regular basis. Legislated reviews of the NEP were completed in 1994, 2005, and 2017. The latest review was coordinated with the review of three other provincial land-use plans that manage development in Southern Ontario: The Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Growth Plan for the Greater Golden Horseshoe. The current updated NEP 2017 came into effect on June 1, 2017.

A recent report by the Auditor General of Ontario, 2022 Auditor General's Value-for-Money Audit of the Niagara

Escarpment Commission (Audit) highlighted significant areas of the Biosphere not covered by management plans, leading to incompatible development.

According to the Audit, only 19 of 1,661 development permits were refused in the past five years, with some approved applications contradicting official plans.

Moreover, the Audit revealed a lack of assessment of the cumulative effects of over 12,000 development permits since 1975. Despite resource challenges for environmental monitoring, acknowledgment of deficiencies allows for ongoing plans to address these issues.

For more information on the Audit see 2.3.9.

For detailed information on changes to the NEP made in 2017 refer to 7.7.1 below.

2.2.6 Update on logistic support function, including main changes since last report.

There are various activities and processes that facilitate the efficient and effective functioning of the Biosphere. Perhaps the most crucial is the recent transition of the convenor function from the Commission to the Network. As Biosphere conveners are responsible to develop, implement, manage and co-ordinate initiatives between the various partners within a Biosphere, they have a key role in ensuring its management and governance sustainability. The UNESCO 2012 review of the Biosphere found that the public, not the government nor its agencies, should have a greater role in overseeing the Biosphere. In March 2022, the Network was incorporated under provincial regulations and the work of the new Biosphere convenor was officially underway.

The Network is a collaborative effort between Indigenous and non-Indigenous communities, emphasizing the equal importance and respect for both Indigenous Knowledge Systems and other scientific approaches/systems. The partnership embraces the concept of Ethical Space, creating and maintaining spaces that honor Indigenous ways of knowing. Two-Eyed Seeing is employed to bridge the strengths of Indigenous and mainstream knowledge, requiring ongoing commitment to active listening, learning, and decolonization. The Network's ultimate goal is cross-cultural collaboration to implement restorative actions for ecological integrity, biodiversity, sustainability, and addressing climate change, benefiting all future generations and maintaining the Biosphere designation. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)

2.2.7 Update on governance management and coordination, including changes since last report (if any) in hierarchy of administrative divisions, coordination structure.

The Commission was the Biosphere convenor from its designation in 1990 until 2019. The Commission is established as an agency of the Ontario Provincial government. The 2012 periodic review of the Biosphere found that the public, not the government nor its agencies, should have a greater role in overseeing the Biosphere. The rationale is that Biosphere conveners are responsible to develop, implement, manage and co-ordinate initiatives between the various partners within a Biosphere and therefore have a key role in ensuring its management and governance sustainability. In response to the 2012 periodic review, Starting in 2014, the Commission initiated a process to establish a more inclusive network for the Biosphere. A Transitional Leadership Committee (TLC) was established in 2019 to guide the development of a new governance model for the Biosphere. The TLC led the leadership transition of the Biosphere from the Commission to a newly formed Indigenous and non-Indigenous co-management and governance framework called the Niagara Escarpment Biosphere Network (Network). In March 2022, the Network was incorporated under provincial regulations and the work of the new Biosphere convenor was officially underway.

The Network is a partnership of Indigenous and non-Indigenous Peoples, wherein Indigenous Knowledge Systems and western science are both seen as equal and respected. Scientific and traditional knowledge is embraced through the concept of Ethical Space and Two-Eyed Seeing as a means to bridge western science and Indigenous Knowledge. See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.

With this in mind, a critical function of the Network is to create cross-cultural collaboration to foster restorative actions to improve ecological integrity, biodiversity, sustainability, and address climate change for the benefit of ALL future generations and to maintain and enhance the Biosphere designation. Refer to 2.1 for more information on the transition from the Commission to the Network as convenors of the Biosphere.

2.3 The authority/authorities in charge of coordinating/managing the Biosphere reserve: (Comment on the following topics as much as is relevant).

2.3.1 Updates to cooperation/management policy/plan, including vision statement, goals and objectives, either current or for the next 5-10 years

The NEP, which has formed the foundational management plan for the Biosphere, is reviewed, amended, and renewed on a regular basis. Legislated reviews of the NEP were completed in 1994, 2005, and 2017. The latest review was coordinated with the review of three other provincial land-use plans that manage development in Southern Ontario: The Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Growth Plan for the Greater Golden Horseshoe. The current updated NEP 2017 came into effect on June 1, 2017. Its purpose and objectives remained the same as the 2005 NEP.

The purpose of this plan is to provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment.

The objectives of the Niagara Escarpment Plan are:

1. To protect unique ecological and historic areas;
2. To maintain and enhance the quality and character of natural streams and water supplies;
3. To provide adequate opportunities for outdoor recreation;
4. To maintain and enhance the open landscape character of the Niagara Escarpment in so far as possible, by such means as compatible farming or forestry and by preserving the natural scenery;
5. To ensure that all new development is compatible with the purpose of the Plan;
6. To provide for adequate public access to the Niagara Escarpment; and
7. To support municipalities within the Niagara Escarpment Plan Area in their exercise of the planning functions conferred upon them by the Planning Act.

During the transition from the Commission to the Network, it was important that a new vision and dream for the Biosphere (Annex VIII) be adopted that reflected the lessons learned and the spirit of the Biosphere. Our vision statement was written by the Network's governance committee during a circle gathering, where the committee reflected on the history and relationship between the land and its peoples within the Niagara Escarpment.

[The Network dream and vision statement](#) reflect Indigenous and non-Indigenous perspectives and commitments to our shared responsibilities to the continuity of life, while working towards protecting the land, water, air, and spirit of G'chi Bimadinaa (Niagara Escarpment in Anishinaabemowin, The Great Cliff That Runs Along). The Network board adopted this vision statement at the recent 2023 AGM, accepting the commitment to work towards the goal of building and connecting networks of our partners across the Niagara Escarpment to share successes and support good practices of conservation that support a low-carbon, diverse, sustainable, resilient and just future for all. The Network as a collective network understands the importance of iterative processes in its strategic planning; sustaining the fire of the Biosphere together is vital to future planning for the next 5-10 years, and thereby continuing to engage our partners in our strategic planning will be the pillar of our work in the coming months.

2.3.2 Budget and staff support, including approximate average annual amounts (or range from year-to-year); main sources of funds (including financial partnerships established (private/public), innovative financial schemes); special capital funds (if applicable); number of full and/or part-time staff; in-kind contribution of staff; volunteer contributions of time or other support.

Since the designation of the Biosphere and until the transition to the Network as the Biosphere convenor, the Commission relied on the province (MNRF) and the broader government for the staff and financial resources needed to deliver the Niagara Escarpment Program. While the Commission is no longer convenor of the Biosphere, it is hoped that the Commission will continue to contribute to the work of the Biosphere by providing access to data and for any updates to the NEP, NEPOSS, development, conservation, research and monitoring.

Environmental Protection for the Niagara Escarpment Biosphere Reserve through Enhanced Community Engagement

In 2019-20, the Commission, Greenbelt and the Niagara Escarpment Foundation (NEF) supported the transition of the convenor role from the Commission NEC to a Transitional Leadership Team through funding of a project, Environmental [Protection for the Niagara Escarpment Biosphere Reserve through Enhanced Community Engagement](#).

The Network recognizes the importance of financial sustainability as the Biosphere convenor, and through the

work of the Finance and Grant Writing board committee will persist in seeking opportunities to enhance our financial stability. The existing funding available to the Network are:

- Federal OECM funding flowing through Plenty Canada
- Niagara Escarpment Foundation grant for self-study report support
- Greenbelt Foundation for a biodiversity signage/awareness project

‘Qualifying United Nations Educational, Scientific and Cultural Organization buffer zones as Other Effective Area-based Conservation Measures within the Niagara Escarpment Biosphere, Ontario’:

Plenty Canada is currently the administrative lead for the Network, as was decided by the Transitional Leadership Committee when it began working directly with Plenty Canada to reactivate the work necessary to meet UNESCO criteria and obligations regarding the stewardship of the Biosphere. As such, Plenty Canada has been administering the activities of Network since its inception, including managing staff, until such time as the Network becomes independent. Plenty Canada received funding to help support the activities of the Network from Environment and Climate Change Canada through a funding program that was designed to provide Biosphere support for the research and establishment of new Other Effective Area-based Conservation Measures, an initiative contributing to Canada’s 2023 conservation targets. The funded project is titled ‘Qualifying United Nations Educational, Scientific and Cultural Organization buffer zones as Other Effective Area-based Conservation Measures within the Niagara Escarpment Biosphere, Ontario’. The funding spanned from the fiscal years (ie. April 1-March 31) 2021-22 to 2023-24. However, the funding was only approved six weeks prior to the end of the 2021-22 fiscal year, therefore the first year of the project was effectively only six weeks long. The funding received from ECCC totaled \$684,362 over the three years of the project (\$122,222 in year 1, \$231,570 in year 2, and \$330,570 in year 3). A total of approximately \$312,900 in matching funds (both cash and in-kind) were contributed by Plenty Canada, Brock University, and Niagara College and Mohawk College over the three years of the project. As of December 2023, Plenty Canada has applied to extend the funding for two additional years.

Niagara Escarpment Biodiversity Awareness

The Network is creating new interpretive signage to promote the importance of biodiversity at key locations along the Escarpment. This initiative was made possible

with \$51,000 of funding from the Greenbelt Foundation. It is in partnership with Brock University, Niagara College, the Escarpment Biosphere Conservancy, Bruce Trail Conservancy, Fleming Education Centre, and Royal Botanical Gardens. See 2.3.3 for more information.

Periodic Review Support

The Network, supported by Plenty Canada, received a \$25,000 operating funding budget from the NEF. This operating budget, administered by Plenty Canada, is used to support a portion of the estimated 680 hours required for the research, writing and logistics for the periodic review process and self study creation. This funding supported a project manager, three lead writers for the self study, a communications team, and administrative assistance for the creation of the self-study. The NEF remains an important partner to the Network, from the genesis of the Network and throughout the evolution of its co-governance structure, the NEF has supported the work of the Network and remains dedicated to the Biosphere.

2.3.3 Communications strategy for the Biosphere reserve including different approaches and tools

geared towards the community and/or towards soliciting outside support.

The Commission, as convener of the Biosphere from 2012-2019, provided newsletters and featured the Biosphere on its website. The Commission also sent communications regarding events and planning updates to the Biosphere network during that period. The Biosphere also participated in the UNESCO-MAB “Brand and Story Toolkit” project in 2015-16 that updated the branding of the Biosphere.

In 2022-23, the Commission focused on digital communications and marketing to implement its “Communicate, Consult and Collaborate” initiative. The initiative informs the Commission on how it relates with clients, ministry stakeholders, members of the public, and Indigenous communities along the Niagara Escarpment. Specifically, the Commission has recently undertaken an initiative to redesign and make significant improvements to its external website. In Phase 2 (expected to be completed in 2023-24), the Commission is focusing on providing educational resources about the Niagara Escarpment, the Biosphere, and the rationale for protection and conservation.



Webster's Falls in Dundas, has become one of the most visited waterfalls in Ontario. With its 30 metre crest, it is the largest waterfall within Hamilton.

The establishment of the Transitional Leadership Committee in 2019 and then creation of the Niagara Escarpment Biosphere Network in 2022 as a non-governmental, not-for-profit organization created the opportunity to better connect with communities and partners across the Biosphere. The aim was to create a sense of shared responsibility among these groups. The Network has developed its own communications plan that aligns with the goals of the transition. Among the Biosphere's many objectives, education remains one of the most prioritized efforts: To further the goals of the Biosphere, engagement with the public regarding conservation efforts and sustainable development has been identified as a priority. The plan is to create partnerships with various community partners to help educate the public and broader community. The Network communication plan has the capacity to share and illustrate diverse knowledge systems and is inclusive of both Indigenous traditional knowledge and western knowledge and the philosophy of Two-Eyed Seeing, to expand sources of biological knowledge and ecological insights. (See Section L for further details on Two-Eyed Seeing.) By addressing the specific needs of diverse audiences through targeted messaging and leveraging appropriate channels, the organization aims to build strong relationships, enhance its reputation, and achieve strategic objectives. Regular assessment and adaptation of the plan will ensure its ongoing relevance and effectiveness. Please see the Network Communication Plan in Annex VI for more detail.

Spotlight on a Network Project - Niagara Escarpment Biodiversity Awareness

The Network is in the process of developing interpretive signage aimed at highlighting the significance of biodiversity at strategic locations along the Biosphere. This project is a collaborative effort involving the Network, Brock University, Niagara College, the Escarpment Biosphere Conservancy, Bruce Trail Conservancy, Fleming Education Centre, and Royal Botanical Gardens. See 2.3.2 for more details on funding. The primary objective of the initiative is to enhance public awareness regarding the importance of biodiversity and its preservation within the Biosphere.

The Biosphere houses nearly a quarter of Canada's endangered or threatened species including the Jefferson Salamander, the Eastern Massasauga Rattlesnake, the Southern Flying-squirrel, and the Eastern Pipistrelle bat. Thousands of visitors and hikers explore the Biosphere region on a yearly basis, but many are not completely aware of its importance for conservation and, unfortunately,

very little signage and information is available along the Biosphere trails and parks to inform visitors. In addition, many people are not aware that they are visiting a United Nations Biosphere Region. Considering the pressures for urbanisation and agricultural expansion, the aim of this project is to improve awareness to better protect these regions that contain a high level of biodiversity, including several species at risk.

The project includes maps, info-sheets, and interpretive signage. The maps and info-sheets are in digital formats that can be downloaded on smartphones. Signage is placed in strategic locations along the Biosphere to allow people to use their phone to connect to a QR code giving more information about the specific region. The maps, info-sheets, and signage are also connected to the Network website where people can readily access information from smartphones or related devices through QR code technology. The info-sheets illuminate the importance of the Biosphere for climate regulation and the importance of trees and green infrastructure as climate action. In addition, through the QR code, visitors will be able to select from different languages, including the four languages of English, French [LV1], Anishinabemowin and a Haudenosaunee language [LV2].

2.3.4 Strategies for fostering networks of cooperation in the Biosphere reserve that serve as connections ("bridging") among diverse groups in different sectors of the community (e.g. groups devoted to agricultural issues, local economic development, tourism, conservation of ecosystems, research, and monitoring).

Fostering collaboration within the Biosphere necessitates a comprehensive and inclusive approach that unites diverse community sectors. Creating connections among these groups is important for effective collaboration and sustainable management. The Network is currently in the early stages of formulating strategies to foster a cooperative network, achieving success in developing multiple communication pieces and establishing a current partnership contact database with over 1,400 partners. Outreach efforts have reached various organizations interested in the Biosphere, employing diverse strategies such as websites, blogs, success stories, Network launches in Niagara and the Bruce/Saugeen Peninsula, participation in events like Celebration of Nations, Ethical Space training, and embracing the concept of Two-Eyed Seeing.

The establishment of the Network research network has been a success highlight. The Biosphere, known for its rich biodiversity and unique geography, hosts diverse research and monitoring initiatives involving various institutions

and agencies. These activities cover biodiversity, ecosystem health, sustainable development, invasive species, and community engagement. Due to the Niagara Escarpment's bi-national nature, numerous internationally linked projects are underway, closely tied to efforts like the Areas of Concern – Remedial Action Plans for the Niagara River and Hamilton Harbour, the Ramsar designation for Wetlands of International Importance, and UNESCO Geopark designation.

The Network will continue to implement strategies to further facilitate the development of the broader partnership network base. The Network will continue to identify Indigenous partners and stakeholders in the community, including local residents, businesses, NGOs, government agencies, and researchers. The Network will continue to develop outreach programs to engage these partners, ensuring representation from all sectors and interest groups. The Network will endeavour to establish regular communication channels, such as community meetings, forums, and online platforms, to facilitate open, inclusive, and ethical communication underpinned by Two-Eyed Seeing. The Network will continue to build network capacity through Ethical Space training to empower community partnerships to promote skills training and knowledge sharing for sustainable resource management. This will include the incorporation of traditional ecological knowledge and practices into conservation and management strategies.

The Network will continue to build the research network and continue to collaborate with educational institutions and organizations to offer workshops, seminars, and training sessions as well as facilitate participatory planning processes that involve partners and stakeholders in decision-making. The Network will continue to collaborate with national and international organizations to access additional support and knowledge and help promote economic incentives for sustainable practices, such as eco-tourism, sustainable agriculture, and green businesses, to encourage local businesses and individuals to participate in conservation efforts.

The Network through the research network will codesign and implement monitoring and evaluation systems to assess the effectiveness of collaborative initiatives and use data and feedback from partners to continuously improve and refine cooperative efforts.

The Network believes that by implementing these strategies, a strong network of cooperation that bridges diverse groups within the Biosphere can be created

while fostering a sense of shared responsibility for the sustainable management of the ecosystem.

2.3.5 Particular vision and approaches adopted for addressing the socio-cultural context and role of the Biosphere reserve (e.g. promotion of local heritage resources, history, cultural and cross-cultural learning opportunities; cooperation with local population; reaching out to recent immigrant groups, indigenous people etc.).

In September 2023, the Network board officially adopted the [“Niagara Escarpment Biosphere Networks’s Principles of Engagement, Dream and Vision Statement”](#), which describe the responsibilities of our organization with our commitments to reconciliation, Two-Eyed Seeing and Ethical Space. The Network understands and follows the teachings of Indigenous knowledge holders on Two Eyed Seeing and Ethical Space.

See Section L for further details on Two-Eyed Seeing.

To quote Annex III:

Stan Boychuk, President of the Canadian MAB Committee (CC-MAB), presented to the 4th World Congress of Biosphere Reserves in 2016. He included “two major areas that Biosphere reserves and the Canadian network and member organizations of CCUNESCO need to address.”

One of which is as follows: “Implementation of the Calls to Action of the Truth and Reconciliation Commission released earlier this year, which outline steps to be implemented in order to mitigate the impacts of historical oppression of Indigenous Peoples in Canada. The implementation of these Calls to Action is critical for achieving a new relationship with Indigenous Peoples.”

CCUNESCO has also established reconciliation as a key priority for the organization and its Man and Biosphere programme.

Ethical Space

The “Ethical Space” is formed when two societies, with disparate worldviews, are poised to engage each other. It is the thought about diverse societies and the space in between them that contributes to the development of a framework for dialogue between human communities. The Ethical Space of engagement proposes a framework as a way of examining the diversity and positioning of Indigenous Peoples and western society in the pursuit of a relevant discussion on Indigenous legal issues and particularly to the fragile intersection of Indigenous

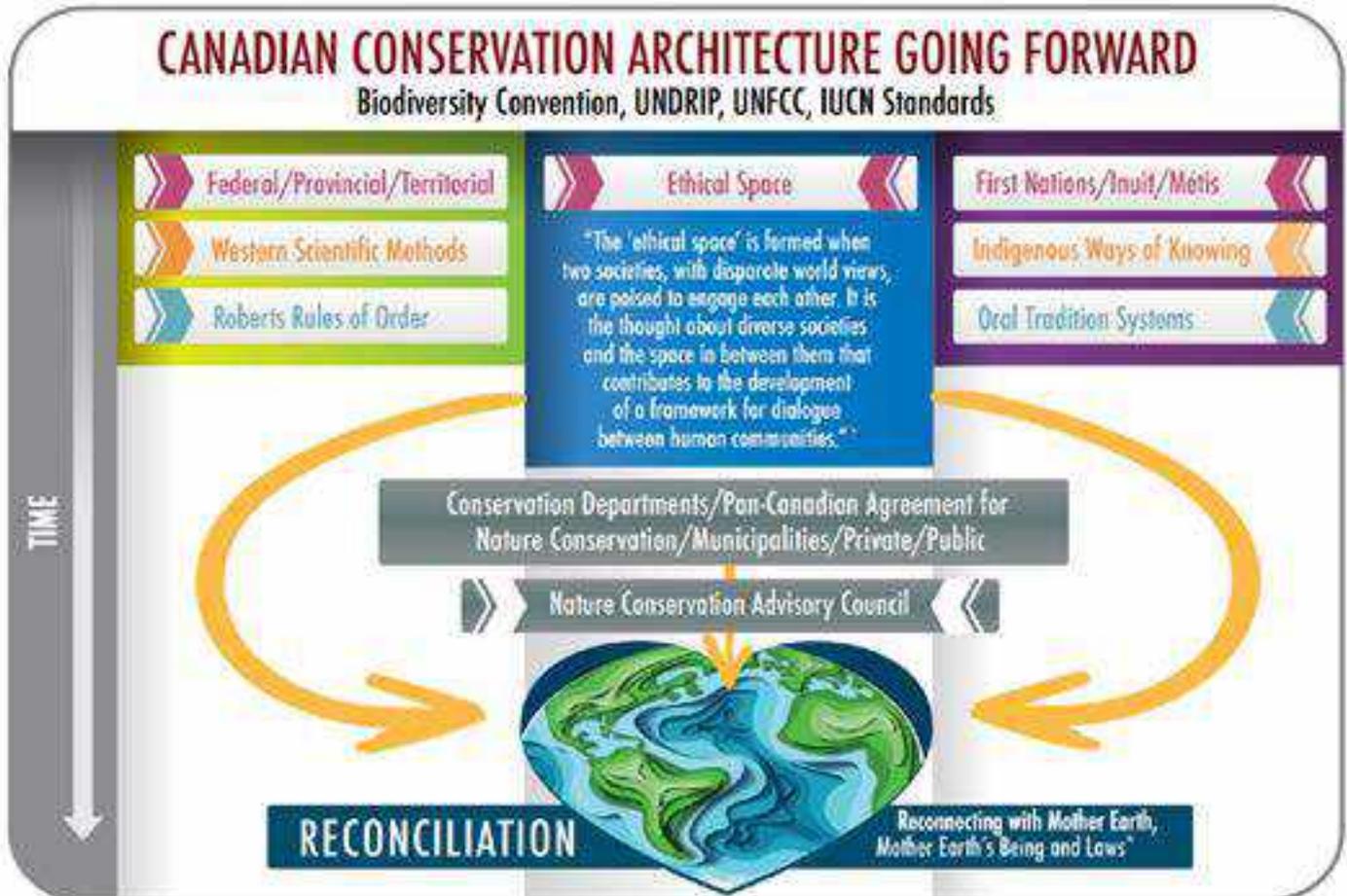
law and Canadian legal systems. See Figure 2.3.5 for an illustration of Ethical Space in Canadian conservation. Ethical standards and the emergence of new rules of engagement through recent Supreme Court rulings call for a new approach to Indigenous-western dealings. The new partnership model of the Ethical Space, in a cooperative spirit between Indigenous Peoples and western institutions, will create new currents of thought that flow in different directions of legal discourse and overrun the archaic ways of interaction (Ermine 2006, 193-194).

Ethical space is an important term and concept that was applied in Canada’s response to its obligations under the Convention on Biological Diversity after the Conference of the Parties meetings in Japan in 2010. Pathways 1 was created involving the territories, provinces, and federal order of government, with two advisory bodies - i.e. the Indigenous Circle of Experts (ICE) and the National Advisory Panel. ICE produced We Rise Together and the National Advisory Panel produced Canada’s Conservation Vision, both of which expanded upon the application of Ethical Space and Two-Eyed Seeing in conservation governance and action with respect to the UN multilateral environmental agreements.

The Network is committed to both Two-Eyed Seeing and the creation of Ethical Space in our governance systems and our relationships with everyone in the Niagara Escarpment Biosphere. This is reflected in our vision and dream statement.

The vision statement directly addresses the shared responsibility, for all of those who work, live, and play on the Biosphere, “For all to live in a healthy environment in the lands connected by the Niagara Escarpment where we work together to conserve and protect the land, water and air for diverse resilient ecosystems and the sustainability of our communities.” See 2.3.1 for more and full statements.

The Network vision and dream statement was developed through numerous discussions with Indigenous and non-Indigenous voices, and required open sharing and listening regarding the historical exclusion of Indigenous communities from the coordination and management of these lands. These discussions provided the board of the Network with the awareness that there was a need to create and achieve safe Ethical Spaces for Indigenous voices to be heard and lead the conversation. This resulted in the creation of “Sustaining the Fire of the Network Together”, a record of the Co-Governance principles that guide the



organization to be an inclusive and successful Biosphere organization (Annex VII)

Since its inception, the Network has taken monumental steps towards reconciliation through the evolution of a co-governance structure in our organization. Beyond ensuring and holding equitable spaces in our board for Indigenous voices, the Network has a commitment to abiding by and reverting to the natural laws that guide our lands and opening our meetings and events in ceremony with all of the beings who surround us. As outlined in “Sustaining the Fire of the Network Together”, the Network has pledged to develop and participate in Ethical Space and inclusive training for all board members. This is essential for creating a shared path towards achieving our responsibility towards the continuance of life.

The Network supports several initiatives that are imperative to the continuation of cross-cultural learning in the Biosphere. Examples include:

Conception of Indigenous Cultural Map

[The Great Niagara Escarpment Indigenous Cultural Map](#) is a multimedia online resource containing stunning photography, captivating video, and contextual information that identifies important Indigenous historic, cultural, and natural world locations along more than 750 kilometres from Niagara Falls to the western region of Manitoulin Island. The site as currently displayed online is a working prototype that was conceptualized, researched, designed, and engineered during an initial seed-funded phase as proof of concept and expands its destinations each year. In its current operational form, the platform reveals virtually unlimited research and educational possibilities and applications across a wide swath of Indigenous subject matter related to the Niagara Escarpment.

The project began in 2016 under the guidance of Plenty Canada Executive Director Larry McDermott, the Director of the Commission, Deb Pella Keen and Plenty Canada’s Senior Advisor and Artistic Director Tim Johnson. Advanced by Plenty Canada, this remarkable resource was produced in association with CCUNESCO, to explore how best to engage and include Indigenous Peoples in the organization and activation of Biospheres within Canada. The Biosphere is one of four Biospheres within Ontario. Each is mapped upon both traditional and historic Indigenous lands, however, little has been done to research, document, and integrate Indigenous land-based knowledge and experience, heritage sites, and areas that are important to the protection of biodiversity into the maps and materials that are used by UNESCO, First Nations, municipalities, educational

systems, and other public agencies and organizations with connections to these areas.

As a result, from January to June 2017, Plenty Canada partnered with the Commission to organize engagement meetings with Indigenous communities living within the Niagara Escarpment to explain the origins and objectives of UNESCO’s Niagara Escarpment Biosphere, and to assess interest and facilitate ideas for increasing Indigenous participation in the Biosphere. Two meetings were held, the first at Six Nations Polytechnic in Six Nations of the Grand River and the second at the Bruce Peninsula National Park Visitor Centre in Tobermory. The consensus that emerged from these two meetings with Indigenous advisors supported Indigenous participation and prescribed that a “story-telling and mapping” project should be the first recommended pragmatic program developed to begin restoring Indigenous Knowledge, visibility, and character to the Niagara Escarpment. Acting upon this objective, Plenty Canada proceeded to secure funds and implement a project to develop a prototype template for hosting information within a digital geographic mapping platform of the Niagara Escarpment Biosphere, inclusive of Manitoulin Island as per the recommendation of the Indigenous advisors at the engagement sessions. This map is described below.

The Great Niagara Escarpment Indigenous Cultural Map

Cultural mapping is a concept and process used by organizations, including UNESCO, to describe a variety of research methods, techniques, and tools applied to the identification,

description, and portrayal of tangible and intangible cultural resources and assets, including those of distinct populations, within select landscapes around the world. Within the context of the Niagara Escarpment, Plenty Canada worked with Indigenous advisors and a growing network of professional allies to document, celebrate, and safeguard important Indigenous heritage resources.

Cultural mapping is emerging as an exciting interdisciplinary field that is fully compliant with and supported by the multi-media capabilities of the Internet. As such, the interactive map of [The Great Niagara Escarpment](#) is layered upon the land featuring appropriate knowledge and histories of meaningful Indigenous locations to re-establish Indigenous experience and voice upon this ancient and special geologic formation.

The applications for this content-infused cultural map are significant across the entire Niagara Escarpment and

World Biosphere network. From educational, natural resource, and land management organizations within First Nations, to provincial agencies like the Commission, municipalities, and international agencies charged with the responsibility of protecting and preserving biologically and historically important regions, this Indigenous conceived and designed project shows great promise in serving the objectives of Canada's Truth and Reconciliation Calls To Action. The Great Niagara Escarpment Indigenous Cultural Map has been supported by Ontario Arts Council, Aboriginal Languages Initiative of the Aboriginal Peoples' Program of Canadian Heritage, Plenty Canada, and numerous volunteers whose efforts enabled the project to significantly exceed expectations and show great promise for future in-depth research phases.

Landscape of Nations

Indigenous Niagara Heritage and Legacy Tour

Twelve thousand and five hundred years ago, the Niagara River burst over the ridge of the Niagara Escarpment and Niagara Falls was formed, beginning its long journey from Queenston to its present location. Remarkably, Indigenous Peoples were there, and have been here in Niagara ever since, harvesting resources, building and inhabiting villages, creating cultural stories, forming nations, greeting Europeans, establishing relations, participating in treaty making, becoming essential allies in the nation-defining War of 1812, and today, designing inspiring education and reconciliation initiatives.

This long and incredibly dynamic history comes alive in Niagara Park's Indigenous Niagara Heritage and Legacy Tour. For the first time, the Indigenous history of the Niagara Region forms the basis and foundation for the development of an authentic and fascinating tour of Indigenous destinations, including historic, cultural, artistic, and natural world locations, including Niagara Falls itself. This appealing program will forever elevate and transform the knowledge and perspectives Canadians, and visitors from around the world, have of Indigenous Peoples.

In addition to the beautiful vista that is Niagara Falls itself, with its stories of powerful forces and influences upon Haudenosaunee and Anishinaabe identity, the Indigenous Niagara Heritage and Legacy Tour explores Indigenous historical locations associated with the War of 1812 and related Indigenous contributions that both defended and helped to shape the development of Canada, such as the geology and ecosystems of the Niagara Escarpment, the Niagara Gorge timeline detailing long standing Indigenous

inhabitants of the region, and spectacular public artworks that memorialise, convey, and commemorate Indigenous culture and history. The tour reveals oral history stories of the lands and culturally important areas to the surrounding First Nation Peoples. For this tour, Niagara Parks assembled a roster of expert tour hosts and guides, including: Indigenous educators, historians, language revivalists, cultural specialists and more. The tour leads participants on an exploration of significant historical and cultural sites, highlighting the oral histories and traditions of the First Nations groups who inhabited this traditional land.

Engagement with Indigenous communities and First Nations in the Biosphere

The Commission Director engaged Plenty Canada in a consultancy, titled "Working Together for a Better World Building Respectful Relationships with Indigenous Peoples in the Niagara Escarpment Biosphere Reserve". Two regional meetings were held, one in the south at Six Nations Polytechnic and one in the north at the Saugeen Peninsula, National Park Office Tobermory in Saugeen Ojibway Nation territory.

It was noted that trust between Indigenous and non-Indigenous Peoples had been eroded by colonial policies. To occupy the stakeholder governance models proposed by the Commission was found to be unacceptable. Conservation protection plans often pushed development through on Indigenous lands, over the concerns of protection voiced by Indigenous Peoples. An opportunity to begin to rebuild trust through projects that re-established Indigenous voice from the land was essential. Only when trust is built can we begin to talk about governance.

Some of the recommendations that came as a result of these meetings are seen below. One common theme was that the relationship between non-Indigenous Peoples and Indigenous Peoples—that trust had been eroded by colonial policies and activities and that to occupy the stakeholder governance models that were proposed by the Commission was unacceptable. Firstly Indigenous Peoples needed projects that re-established Indigenous voice from the land and through reporting of these projects there was an opportunity to build trust. Only when that trust is built can we begin to talk about governance. One other common theme was the concern that as Indigenous Peoples try to protect their lands that conservation protection plans often pushed development upon the very lands Indigenous Peoples were trying to protect.

Key takeaways from the outreach meetings can be found below.

Indigenous Outreach May 2, 2017, Six Nations Polytechnic, Six Nations of the Grand River

- “The quality of the relationship is what matters the most” (Rick Hill)
- “Caution of the “one area is sacred, not the rest” approach – this is not a good mindset.” (Rick Hill)
- “Cultural Mapping as a process to reclaim cultural landscape. The story of the land gets captured for the moment. Re-establishing the relationship to place, help establish our concern and find common vision. Indigenous Peoples need to see their place in the work. Re-constructing Indigenous Life along the Escarpment.” (Rick Hill)

Indigenous Outreach June 27, 2017, Bruce Peninsula National Park Visitor Centre, Tobermory

- An agreement that it is important to build the relationship to strengthen Indigenous voice. Cultural mapping was discussed and agreed upon as a priority as a way of building relationships with Indigenous Peoples and the Biosphere.

2.3.6 Use of traditional and local knowledge in the management of the Biosphere reserve.

The Network is a unique Biosphere organization that truly commits to Two-Eyed Seeing and co-governance. (See Section L for further details on Two-Eyed Seeing.) This process means that true dialogue and listening have commenced between our organization and the Indigenous communities in the Biosphere. An important component of the engagement and discussion with the First Nation peoples in the Biosphere is that there is a strong need to uplift Indigenous Knowledge holders and Indigenous research in the Biosphere. The work that many Indigenous communities are committing to in the Biosphere is a part of the Network commitment to ensuring that natural law is reverted to and that true sustainability is attained. Some projects that focus on traditional and local knowledge for the management of the Biosphere are:

Healing Places: Indigenous Nature and Culture Gardens and Trails

In 2021, Plenty Canada began working with the Bruce Trail Conservancy, Forests Ontario, and Indigenous partners to develop two new [‘Healing Place’](#) sites along the Bruce

Trail — one in the Smokey Hollow Nature Reserve near Waterdown, in the traditional territories of Mississaugas of the Credit First Nation and Six Nations of the Grand River, and one in the MapleCross Nature Reserve at Cape Chin near Lion’s Head, in the territory of the Saugeen Ojibway Nation. The sites are intended to be spaces to meaningfully engage Indigenous and non-Indigenous communities in a restorative process, creating physical places of healing while at the same time cultivating safe, Ethical Spaces. As an Indigenous-led organization, Plenty Canada is leading this project, following the same co-governance principles that were developed during the inception process of the original Healing Place site that Plenty Canada created with local partners in Shanly, ON. Traditional and local knowledge is being used in the development of the Bruce Trail Healing Place sites, as Indigenous advisors from each of the traditional territories provide cultural and curatorial guidance for the conceptual content, site designs, selection of Indigenous plants to be highlighted and/or planted at the sites, and the history and knowledge to be shared as part of the educational component of the sites. The long term goal is to have Healing Places throughout the Bruce Trail (one in each of the nine sections), which spans the entire Biosphere, developed in collaboration with Indigenous partners from the traditional territories of each site. More information on this project can be found below in 2.3.7.

Wisdom from Knowledge

With the support of a major grant from the Greenbelt Foundation, Plenty Canada partnered with the University of Guelph to launch a three year biocultural knowledge and mapping project to begin restoring Indigenous Knowledge, visibility, and character to the Greenbelt as an important Indigenous cultural landscape within Ontario.

Entitled *Wisdom from Knowledge (Nbwaakaawining binjibaamgad Gkendmaawziwin): Documenting and Sharing the Indigenous Biocultural Richness of the Greenbelt*, the project will result in three exciting deliverables. These include the development of a taxonomic list of culturally significant Indigenous plants in collaboration with Indigenous plant knowledge Winnholders; research and assembly of content for an ethnobotanical atlas or field guide that includes both western science and Indigenous Knowledge such as morphology, life-history, conservation status, and Indigenous uses; and the building out of Plenty Canada’s technology platform, The Great Niagara Escarpment Indigenous Cultural Map, to embrace the entire Greenbelt region, including engineering and custom

programming of the web platform's superstructure and content management system to house knowledge content and photo and video documentation.

"We're honoured and delighted to have received this grant award," said Plenty Canada Executive Director Larry McDermott. "We believe that bridging Indigenous traditional knowledge systems with western science is essential to practicing effective environmental stewardship. In recent years, Indigenous-led frameworks that braid together both western science and Indigenous Knowledge systems have been used to guide conservation activities, such as the establishment of Indigenous Protected Areas, the stewardship of cultural keystone species (e.g., black ash, moose), and in cross cultural educational programming with youth."

As an institution of higher learning, Guelph University has purposefully engaged with Plenty Canada to identify and launch programs that broaden the knowledge and perspectives its conservation students learn and apply to their profession. Robin Roth, professor in the Department of Geography, Environment, and Geomatics, and the university's collaborator on the project, envisions significant outcomes that will benefit those communities and organizations affiliated with the Greenbelt.

"Along with Dr. Faisal Moola, we are thrilled to be collaborating with Plenty Canada on this project and to assist in making more visible the Indigenous biocultural values present throughout the Greenbelt," said Professor Roth. "The map and the atlas will make for excellent teaching tools and will provide greater access to the public so that we can all better understand the historic and contemporary importance of the Greenbelt for Indigenous Peoples."

The awarded project builds upon the success of a previous pilot project that Plenty Canada launched in 2017 in partnership with the Commission and Canadian Commission for United Nations Educational, Scientific, and Cultural Organization (CCUNESCO). Its purpose was to document, celebrate, and safeguard important Indigenous heritage resources on and along the Niagara Escarpment. The first phase of that project (also highlighted in this edition of the contact newsletter) included the development of an interactive prototype digital map of the Niagara Escarpment named [*The Great Niagara Escarpment Indigenous Cultural Map*](#).

As a logical complement and extension of this, work Plenty Canada is now planning to expand its research and mapping project to the entire Greenbelt region in an

effort to gather Indigenous Knowledge and scientific data and resources to establish a repository of information that will aid public education and serve as the foundation for enhancing awareness of the importance of preserving natural world ecosystems and green spaces to safeguard Indigenous flora.

By combining western science and Indigenous Knowledge systems in the service of educational and member organisations of the Ontario Greenbelt Alliance, as well as the general public, these biocultural resources will enhance and strengthen the goal of ensuring the 'Greenbelt remains permanent, protected, and prosperous.'

The mapping component of the project will be led by Plenty Canada Senior Advisor Tim Johnson. "Place-based learning, sometimes called pedagogy of place, has gained ascension in teaching practices and educational curricula for its immersive and experiential qualities that connect students to local heritage, cultures, landscapes, ecosystems, and experiences that serve as a foundation for understanding Indigenous histories and scientific knowledge," said Johnson. "Plenty Canada has employed this approach within its Indigenous Cultural Map through the development of destinations including historic sites, public spaces, and natural world features that constitute prominent learning locations. This pedagogy prioritises engagement and authenticity in ways that make learning real and memorable."

Designed as a two-year project that will include numerous Indigenous Knowledge holders and science advisors from Guelph University and elsewhere, it will result in the implementation of a pedagogical strategy that utilizes Indigenous biocultural mapping content to appropriately process and share Indigenous histories, knowledge, and stories of the Greenbelt, including the use and application of the field guide that will include ethnobotanical species for field identification. Within the context of place-based learning as described, both the field guide and mapping platform will provide ready access to the information collected by the project.

From an Indigenous perspective and educational standpoint, a significant aspect of this project seeks to stimulate and nurture empathic traditions to foster deeper relations and connections between Ontario's citizenry and nature.

Humans begin life in an empathic state, given their dependence upon others and that which nature provides, but over time learn the behaviours of self-interest as they grow to adopt the philosophies, rules, and values

promoted within modern culture. However, other cultures, particularly the cultures of Indigenous Peoples, remain rich with empathic traditions that present far different foundations for human consciousness. This educational addition to the Greenbelt will play a role in helping to activate both the knowledge and empathy required to ensure respectfulness and gratitude for the living earth, shaping human intention and guiding responsible human behaviour. For more information on this project, see section 6.3.

2.3.7 Community cultural development initiatives. Programmes and actions to promote community language, and, both tangible and intangible cultural heritage. Are spiritual and cultural values and customary practices promoted and transmitted?

Cultural heritage refers to the inherited physical artifacts and intangible attributes of a group or society that have been passed down from one generation to the next, maintained in the present, and bestowed for the benefit of future generations. Cultural heritage includes tangible culture (artifacts, historic buildings), intangible culture (traditions, language and knowledge), and natural heritage (culturally significant landscapes and biodiversity). The Biosphere has had significant projects that contribute to safeguarding cultural heritage. A summary of some of these initiatives in the Biosphere follows.

The Laura Secord Legacy Trail

The Laura Secord Legacy Trail, which follows the path that Laura took to warn the British and

their allies of the impending American attack, connects Queenston to Thorold, with the two public art displays, Landscape of Nations Memorial and the First Nations Peace Monument, serving as bookend destinations.

Friends of Laura Secord President Caroline McCormick and Vice-President David T. Brown established the Friends of Laura Secord to preserve, strengthen, and perpetuate the Secord legacy, and to inspire and educate current and future generations about the many heroes, both famous and unsung, who helped to define Canada. First Nations Senior Advisors Tim Johnson and Larry McDermott were instrumental in attracting the support and design contributions of Douglas Cardinal to the memorial project.

Masters of Conservation Leadership

The Masters of Conservation Leadership at the University of Guelph is the only masters program in Canada for early to mid-career conservation professionals. Launched in

2020, it emphasizes building the competencies required for conservation practice that are collaborative, attuned to Indigenous rights, responsibilities and leadership, and positioned to advance creative and urgent solutions for a sustainable future. The program, led by Drs. Robin Roth and Faisal Moola of the Department of Geography, Environment and Geomatics, attracts students from across Canada and internationally who work full time while completing a largely online curriculum. Two to three times during the 24 month program, students travel to Guelph for a residency. Every year over the past four years, one of those residencies has taken place in the Niagara Escarpment Biosphere in collaboration with Plenty Canada and Landscape of Nations 360. The programming is co-delivered and introduces students to the critical historical and contemporary presence of Haudenosaunee and Anishinabek Peoples in the region. Through site visits to the Landscape of Nations memorial, Fort George National Historic site, the council house, an opening Thanksgiving address, the Laura Secord Trail, and meetings with conservationists including the Niagara Park Commission and Parks Canada, the students gain an appreciation for the origin of Canada and the way early relationships contain messages for today. They also gain insight into Indigenous relations to land and waters, which deepens their commitment to reconciliation and supporting Indigenous led conservation. After the residency, students are able to isolate lessons from their learning for the organizations they work for - providing insight into what co-governance can look like and how to advance reconciliation. The University of Guelph and its MCL program looks forward to continued collaborations in the Niagara region and is thankful for the stories held in the landscape which are becoming better known and articulated through the hard work of the Network, the Niagara Parks Commission, the Six Nations of the Grand River, Landscape of Nations 360, and Plenty Canada.

University of Toronto Hart House Farms Landscape Architecture Studio

The University of Toronto acquired Hart House Farms in 1949, and the 150-acre farm located within the Biosphere buffer zone has been traditionally used by the university's community as a recreational site for students. As Hart House approaches its upcoming 75th year as part of the U of T community, it has been engaged in long-term strategic planning for the Farm. In the wake of the University of Toronto's Truth and Reconciliation report "Answering the Call: Wecheehetowin", it was recognized that there was a need for Hart House Farms to develop and strengthen relationships with the Indigenous community, the

Mississaugas of the Credit First Nations, and surrounding partners to create a center for learning, research and education for the U of T and greater Toronto community.

The University of Toronto's Master of Landscape Architecture program, led by Liat Margolis, an associate professor of Landscape Architecture at the John H. Daniels Faculty and co-lead of the Indigenous youth land-based program Nikibii Dawadinna Giigwag, has partnered with Hart House to research the Indigenous-Settler relations and environmental history of the Farm and create design proposals and forest management plans that explore its future as a locus for Indigenous-led and co-led land-based teaching, research, and community-engaged programs. The goals of this studio were to develop an understanding of the environmental history of the land under a decolonization lens and create a framework of understanding of the Farm as part of a larger landscape mosaic and network of stewardship, to develop a set of values, designs, management, and partnerships as part of Hart House's forthcoming strategic plan. The MLA Advanced Design Research Studio has made a significant contribution to the development of this long-term plan by deeply exploring and considering the land the Farm is

situated on to understand its historical, present, and future contexts, rooted in decolonization and land relations.

This studio's methodology was deeply rooted in partner engagement with the Network, the Commission, Mississaugas of the Credit First Nation, Credit Valley Conservation, the Bruce Trail Conservancy, the Town of Caledon, and the Waakbiness Institute for Indigenous Health. Throughout this process of partner guided site walk and land-based learning, as well as multi-partner dialogues, the students of the MLA program were able to create design proposals that expanded past the conventional recreational use and historical landscape management of Hart House Farms. The discussions that the MLA students, Liat Margolis, and the partners had were able to guide the learning outcomes of the course and assignments to be responsive to what the partners, Hart House Farms, and the land needed. The design proposals exhibited what could be possible with an interdisciplinary and integrated lens of Indigenous-led and community-centered land relations, landscape architecture, and ecological conservation to decolonize a European-settled landscape to restore natural law.



Landscape of Nations Commemorative Memorial in Queenston Heights Park on the Niagara Escarpment.

The principles and recommendations that were explored at the final review of the studio by the MLA students, the partners and rights holders, and Hart House Farm staff will be summarized and integrated in the strategic planning for the Farm. This studio led by Liat Margolis is a prime example of how experiential education within the landscapes of the Biosphere can profoundly shape the learning of the students and provide them with genuine connections to the land and partners within it.

Niagara Falls History Museum - Empathic Traditions: Niagara's Indigenous Legacy

The Niagara Region was a place of awe and wonder for the Indigenous Peoples who first walked this land. Their ancestors' footsteps arrived approximately 13,000 years ago as the melting glaciers retreated northward, revealing the Great Lakes of Erie and Ontario and the mighty Niagara River while giving genesis to an environment rich with life.

In this exhibition, Empathic Traditions: Niagara's Indigenous Legacy, objects selected from the Indigenous collections of the Niagara Falls History Museum reveal the presence of Indigenous Peoples, their art and history in the region, extending back hundreds of generations up to the present day. Vivid imagery of the artifacts combined with interpretive information help us understand what life was like for those who first arrived.

By examining projectile points, stone tools, pottery shards, jewelry, and other ancient creations, as well as historic and contemporary items, we learn about the cultural connections Indigenous Peoples developed with nature and their relationships with Europeans. We learn how the necessity of survival required the design of useful tools, how function influenced form, and how form created objects of great beauty. If nature is aesthetically pleasing and inspirational then Niagara Falls must be considered a muse of epic proportion. From the first human encounter with the mighty cataracts, artful interpretation ensued.

When we reference Empathic Traditions, we are talking about the repetitive gratitude that is expressed through the Haudenosaunee Thanksgiving Address (Ohen:ton Karihwaterhkwen, Words Before All Else) and other Indigenous teachings intended to stimulate empathic responses that nourish the emotional and intellectual development of the human being. Maturity is achieved when a consciousness blossoms that recognizes the enormous responsibility humans have — as extremely powerful life forms — to protect and support the very same creatures, elements, and energies that sustain human life. Such teachings constitute a cultural value system that

requires both acknowledgement and reciprocity. These teachings produce cultural value systems that promote environmental stewardship, conservation, and ecological restoration. As well, they reinforce the reality that we humans must live in concert with the natural laws that govern the universe, principles that align with UNESCO's Biosphere platform.

The introductory text and object labels you will see in this exhibit feature Indigenous voices as well as that of historical, archeological, artistic, and community experts.

— Project team lead by Tim Johnson

Healing Places: Indigenous Nature and Culture Gardens and Trails

The name "The Healing Place" speaks to its role in the process of reconciliation. It provides a safe place within Ethical Space for community members of both Indigenous and non-Indigenous origin to come and participate in the healing process of reconciliation so that our communities can learn to move forward and to learn to live and work together. These spaces also represent a healing of the relationships between ourselves and the land. The Niagara Escarpment Biosphere Network supports the establishment of such sites within the Niagara Escarpment Biosphere as manifestations of co-governance and sites for intercultural place-based learning. One such site currently being developed is the Dish With One Spoon Healing Place to be located near the Smokey Hollow Waterfall in Waterdown, Ontario.

Dish With One Spoon

Huron-Wendat, Anishinaabek, and Haudenosaunee cultures are diverse and yet share principles and teachings related to the land. The Huron-Wendat, and Mohawk speak Iroquoian languages. The Anishinaabek speak Algonkian languages. No matter what the language, one key common metaphor in this region was the Dish with One Spoon, representing the sharing of nature and its abundance of foods and medicines. (See L) for more information on the Dish with One Spoon.

Under the Great Dish Treaty, the people agreed to common rules:

- Only take what you need;
- Always leave something in the Dish for others;
- And keep the Dish clean (don't harm what it offers).

Here, at this site called Smokey Hollow, the depression and contours of the land created a natural bowl, or dish, that symbolizes the Dish with One Spoon concept. The side trail

that leads up the hill features additional elements including a planned and planted grove of American chestnut trees, an elevated vista of the confluence of Grindstone Creek, a display of environmental damage caused by the Emerald ash borer, signs that identify Indigenous trees and plants, and much more.

Edge of the Woods

From the chosen location, you will see three trail entrances that emerge from the woods, two along the main Bruce Trail to the left and right, and one up the hill along the side trail. From the Haudenosaunee Confederacy, People of the Longhouse that includes the Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora nations, comes a cultural practice of greeting visitors to their villages. This protocol, called the Edge of the Woods, established a set of traditional customs to ensure the proper treatment of guests and also to confirm that guests arrived with honourable intentions.

Here is how you, as a visitor, would be greeted:

“Now we stand you up and brush away all of the things that may have accumulated upon you from your travels. We start from your head, all throughout your body, right down to your feet. At this time we say to you that we now welcome you into our territory and that you may stay as long as you like.”

“We ask that you be mindful of the ways of our village and if you cannot obey these rules then we have no other resources but to tell you that you must move on from our village. Leave as soon as you hear this message for we will not be able to aid you after this. Just be aware that you will no longer be under the protection of our laws.

“Now at this time, we will all go around and greet you and shake your hand and welcome you to our village. When the handshake is done, you will be given the chance to speak and tell us your message. After we have had time to take in your message and consider your purpose, we will let you know how we feel about the message that you carry. When we are satisfied with your message and purpose, we will then release you of your duties. As we said before, you may stay as long as you like but do not stray from our rules.”

– Transcript of Edge of the Woods oratory by Bob Brown, cultural advisor to the Oneida Nation of Wisconsin, with editing by Judith L. Jourdan.

Foods of the Forest, Indigenous Nut Trees

In the garden, is a selection of nut trees that have provided sustenance for Indigenous Peoples for hundreds

of generations. These trees are considered not only as lumber, but as sustainable food sources that provide energy and nutrition. They are planted here amid an ecological restoration site featuring Indigenous prairie tallgrasses.

The care and protection of nut trees remains vital to Indigenous Peoples. Most nuts are edible and nutritious and were easily obtained by gathering them from carefully managed forests. Nuts are fruits or kernels protected by and derived from hard or tough nutshells of flowering trees. There are some 20 edible nut species native to deciduous forest regions of southeastern Canada, such as here in the Great Lakes watershed.

These include the American chestnut, American hazelnut, American beechnut, and black walnut. All were known to have been used as food by Indigenous Peoples.

Nuts are effective nutritional sources providing protein, fat, carbohydrates, and vitamins (B-vitamins) and minerals (such as iron). They serve as supplements to the Indigenous diet consisting of the complementary crops of corn, beans, and squash, as well as fish and forest animal resources. Nuts can be eaten raw or cooked to enhance their taste and nutrient digestibility. They also produce significant quantities of oil.

Other Indigenous nature and culture gardens are being planned within the Niagara Escarpment Biosphere through a partnership involving Plenty Canada, Bruce Trail Conservancy, Forests Ontario, and Ontario Power Generation. The next site will be developed at Cape Chin, in the northern region of the Saugeen (Bruce) Peninsula.

Landscape of Nations

Located in Queenston Heights Park, the Landscape of Nations Memorial is dedicated to the Haudenosaunee (Six Nations) Confederacy and Indigenous allies that participated in the War of 1812. The Landscape of Nations Memorial affirms the proper place of First Nations peoples at the core of Canadian history and signals their ongoing role in contemporary life and national affairs. The memorial also recognizes the historic ceremony of peace and reconciliation held in Niagara on August 31 and September 1, 1815, that restored peace among the First Nations who fought on opposing sides during the war.

Powerful experiences are gained from the creation of spaces and forms that foster emotional and intellectual impulses. Landscape of Nations is a place of experience that not only communicates a singular event in the War of 1812, but also anchors that event in the context of history

and culture of the Six Nations and Native allies. The central meandering pathway is a metaphor for the passage of time as well as the values of peace and mutual respect.

Two primary figures of the war, John Norton and John Brant, war captains from the Six Nations, serve as sentries to the entrance of the pathway leading to the longhouse (the traditional architectural structure of the Six Nations people). John Norton was adopted by the Mohawk Nation and was appointed to be a diplomat and war chief for that nation in 1799. John Brant was the son of the famous Mohawk leader Joseph Brant and he became, along with Norton, a leading war chief of the Haudenosaunee during the War of 1812.

This central pathway connects and organizes all other features within the Landscape of Nations. Representing the Two Row Wampum Belt, which was created after the Dutch and the Mohawk first met in 1613, it embodies the principles of all subsequent treaties made between the Six Nations and other governments. Wampum belts serve as mnemonic devices designed to refresh memories and were fashioned from beads made from clamshells. The two separate rows of parallel purple beads represent the Native canoe travelling alongside the European ship, separate but equal on their journey through life and yet bound by mutual respect.

The Memory Circle is the main destination point of the installation. Enclosed within the remnant berm of Fort Riall in Queenston Heights Park, the story of the battle and the Native participants are told here. It recognizes the sacrifice and valour of the Native people who served and, importantly, the peace that brought the War of 1812 to a close. The centre of the circle creates a contemplative gathering place for all visitors.

The journey ends at a living Tree of Peace, the Six Nations symbol of peace and unity. Weapons would be symbolically buried under the tree to seal a peace agreement. An eastern white pine was the symbol of the Iroquois constitution known as the Great Law of Peace. Its characteristic bundles of five needles became the symbol of the original Five Nations joined together as one. The Tuscarora Nation became the sixth nation in 1722.

According to Iroquois tradition, the Great Law of Peace ended the ancient cycle of enmity and continuous conflict between the separate tribes and united them into the Iroquois Confederacy, the most powerful force in North America until the rapid expansion of European colonization in the 18th century. This ancient peace, severely threatened by the War of 1812, needed to be

restored among Six Nations people who had fought against each other.

The Landscape of Nations Memorial has advanced public understanding while transforming the Niagara Region's engagement with Indigenous Peoples.

First Nations Peace Monument

The First Nations Peace Monument is intended to help generate a deeper understanding of the rich heritage and ongoing history of First Nations peoples and illuminate their vital contributions to the founding and evolving identity of Canada. It also provides an opportunity to acknowledge the transgressions and help mend the divisions that extend back to our earliest shared history, in a spirit of mutual respect and reconciliation.

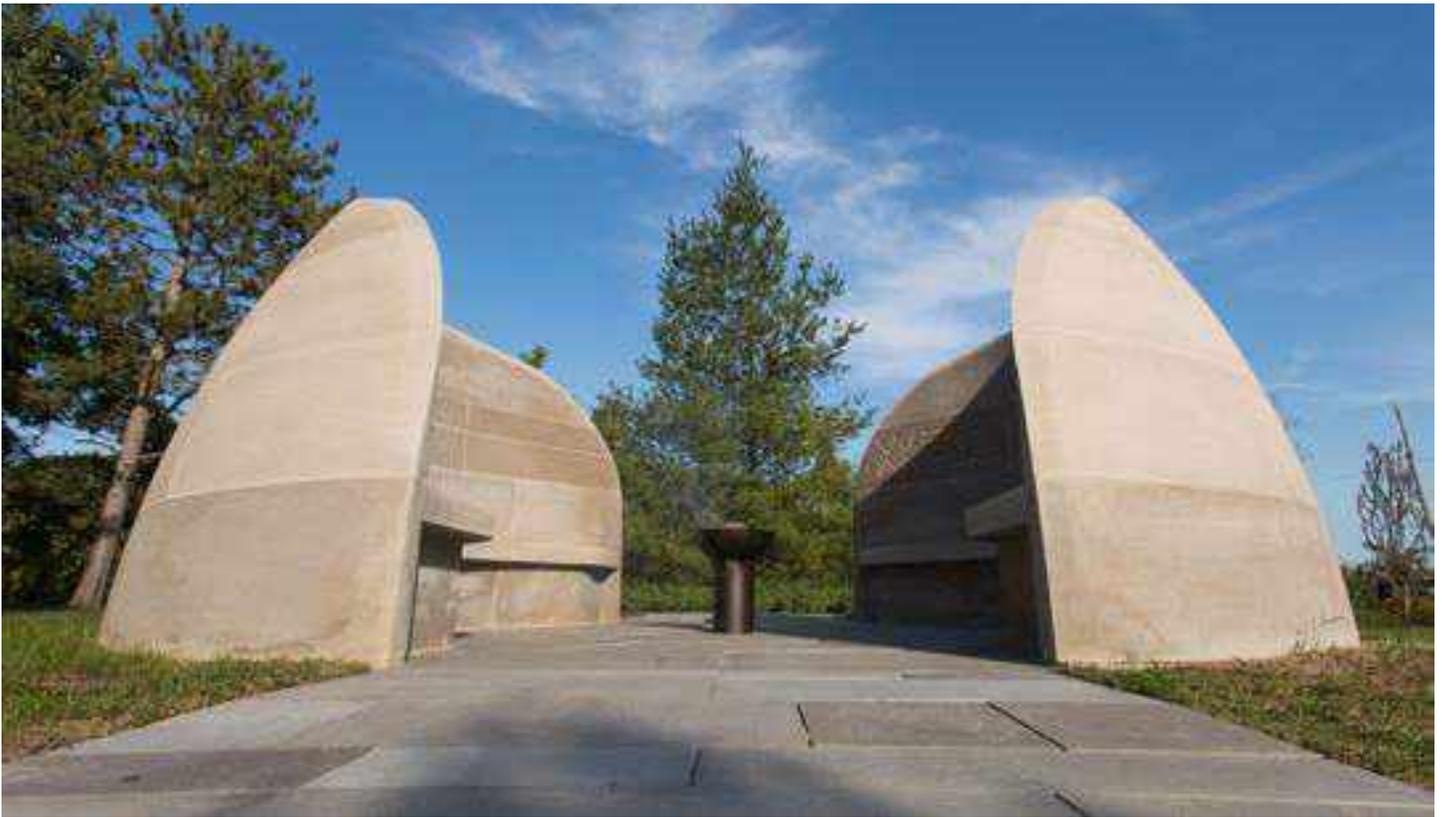
The monument allows for interactive reflection upon events that took place in Niagara and were echoed throughout the nation, events which symbolize the wide range of First Nations' contributions to the formation of our nation and should be recognized, shared, and honoured by all Canadians.

This aesthetically moving and highly symbolic stone monument amplifies upon a well-known Canadian story to generate a deeper understanding of the important role First Nations played in the building of Canada.

By broadening the historic narrative of Laura Secord's famous trek, the First Nations Peace Monument helps reveal the central role of the Haudenosaunee and other allies in the pivotal Battle of Beaverdams. The battle was fought almost entirely by First Nations forces from Kahnawà:ke and the Grand River who took on the numerically dominant and better-armed American opponents in defence of Indigenous and Canadian lands and freedoms. These intertwined narratives dramatically illustrate how the often uneasy relationship between First Nations peoples and European settlers could be galvanized, under common threat, into a powerful and genuine allegiance to defend their collective national interests.

Douglas Cardinal, Siksika / Blackfoot, is celebrated for his signature architectural style consisting of curvaceous lines, organic forms, and nature-inspired aesthetics. He generously donated his detailed design concept to this project and oversaw the development of the monument through its completion.

Cardinal's design is a distinctive and highly symbolic circular stone monument. The circle is a powerful symbol of welcoming, inclusion, and protection in many Native



The First Nations Peace Monument, designed by world renowned Siksika architect Douglas Cardinal, stands close to the site Canadian heroine Laura Secord first encountered First Nations warriors in DeCew's Field.

cultures. The protective curved walls are abstract symbols of Haudenosaunee longhouses that open to the East and West, with a central hearth.

Embedded within the walls of the monument are two graphic wampum belt symbols: the Hiawatha Wampum Belt, which expresses the Haudenosaunee Great Law of Peace, and the William Claus Pledge of the Crown Wampum Belt, which symbolizes the restoration of peace and relations among Native allies and the British following the War of 1812.

This monument, initiated, managed, and maintained by the Friends of Laura Secord and the City of Thorold, is dedicated to the proposition that the commonalities and shared experiences that bind us together as allies today must become much stronger than our historic differences. Over the past 150 plus years, Canadians have documented the evolution of their nation by celebrating leaders from the political, military, and demographic mainstream. But that story is incomplete. On the eve of Canada's Sesquicentennial, this monument was built to emphasize the vital contributions of First Nations peoples and to remind Canadians of the critical importance of reconciliation and fellowship with First Nations communities.

Voices of Freedom Park

At the southern landing of the Niagara Escarpment Biosphere lies the Town of Niagara-on-the-Lake, capital of Upper Canada (1792-1796), which has had Black residents since the 1780s. It is also where the first anti-slavery legislation was introduced in the British Empire.

In the 1780s, following the American Revolution, United Empire Loyalists settled in the area. Many brought the Africans they enslaved with them. The post-revolution migration also included Black Loyalists who fought in "Butler's Rangers" and received their freedom and land.

When Lieutenant Governor John Graves Simcoe arrived in 1792, there were two classes of Blacks in the province: those who were enslaved and those who were free. Slaves outnumbered the free until the early 1800s, when freedom-seekers migrated into the area. A large number of the Black population settled in the "coloured village," roughly south of William Street and between King and Butler Streets. However, racism and discrimination were a reality, and they struggled to become truly "free" and equal.

About Voices of Freedom

Voices of Freedom Park gives expression to the silenced and forgotten stories of people of African descent,

enslaved, freed, and free, whose sacrifices, labour, skills, and talents contributed to the development of Niagara-on-the-Lake. Voices of Freedom permanently inscribed these Black men and women on the historical and cultural landscape of the town.

Voices of Freedom honours their struggles, resilience, and contributions to the town, the province, and to Canada's development. Key pieces of the cultural heritage of Niagara-on-the-Lake and national history are being preserved through the park. Voices of Freedom enhances the cultural and redemptive value of Niagara-on-the-Lake as a significant historic site and supports educational aims of the United Nations International Decade for People of African Descent. This important public space provides opportunities for engaging visitors with ideas and historical information on both emotional and intellectual levels. A strong experience of place is fostered through a broader dialogue on important social issues, in essence supporting a metaphorical passage forward that builds on historical events.

Site History

From 1796-97 until 1803 when he sold it to the Crown, David William Smith, acting surveyor general, owned the park land. In 1803, the land was acquired by the colonial government of Upper Canada. On October 16, 1812, General Sir Isaac Brock and Colonel John MacDonnell lay in state at the Government House on the Regent Street block and it was from this site that their funeral procession began. In the 1850s, the land was transferred to the town. Between the 1850s and 1913, the site remained unoccupied. In 1913, the Niagara-on-the-Lake Lawn Bowling club leased the site and occupied it until 2011. In 2011, The Niagara Foundation provided critical leadership to prevent development on the site and preserve it as a public space. Between 2014 and 2017, town council and community voices embarked on a path that led to the adoption of the plans for Voices of Freedom Park. Voices of Freedom Park was opened to the public on November 4, 2018.

— From Voices of Freedom Park committee on which Tim Johnson served.

2.3.8 Specify the number of spoken and written languages (including ethnic, minority and endangered languages) in the Biosphere reserve. Has there been a change in the number of spoken and written languages? Has there been a revitalization programme for endangered languages?

The Niagara Escarpment Biosphere ranges from the Niagara Region to the most northern tip of the Saugeen

Bruce Peninsula, covering the most diverse and populated regions within Ontario. A scan of Statistics Canada's most recent Focus of Geography Series, part of the 2021 Population census, highlights numerous languages spoken across the municipalities within the Biosphere, including English, French, Punjabi, Hindi languages, Spanish, Portuguese, Italian, Tagalog, German, Pennsylvanian German, Polish, Dutch, Urdu, Arabic, Mandarin, Korean, Hungarian, and Croatian. Endangered language groups Indigenous to the land of the Biosphere are Mohawk (Kanien'kéha or Kanyen'kéha), Onondaga (On̄da'gegá' or Onōnda'gegá'), Cayuga (Gayogohó:n̄q'), and Anishinaabemowin or Anishinàbewin.

There has been a shift to rich community-led revitalization of Indigenous languages within the Biosphere over the last ten years that has led to the emergence of Indigenous languages programming that strengthen the health and knowledge of native and secondary speakers. The declaration of the United Nations International Decade of Indigenous Languages draws our global communities' attention to the complete extinction of many Indigenous languages globally. The Network recognized this critical loss of language and increasing endangerment of Indigenous languages on April 22, 2022, at our inaugural event with partners from across the Biosphere. The Network acknowledged the importance of safeguarding and revitalizing these languages, and provided space for the commitment and love of the land to be shared in

Kanyen'keha (Mohawk) by one of our partners. The Network continues to celebrate and uphold the work done by many of the First Nations within the Biosphere in striving to establish their own language programming as a means of intergenerational healing and a strengthened link to connect the community with their spiritual, physical, and cultural vitality. In an effort to do so, an important component of the "Niagara Escarpment Biodiversity Awareness" project, is that the signage information will be translated into two Indigenous languages and will be available on the Network website.

Onkwawenna Kentyohkwa

Onkwawenna Kentyohkwa is a community-based organization in the Six Nations Grand River Territory that teaches the endangered language, Kanyen'keha (Mohawk), to the community. The organization was established in 1998, as it recognized the difficulty in the orthodox manner of teaching Kanyen'keha in Grand River using a 'whole words' method, despite Kanyen'keha being a polysynthetic language where single words can be the equivalent of a complete sentence in the English language. This orthodox

method of teaching thereby required students to memorize the equivalent of whole sentences, and inspired the creation of a language curriculum using a ‘root word’ method. This curriculum has demonstrated its success and, in the twenty years since the establishment of the organization, 140 students have completed the First or Second Year Programs. The Onkwawenna Kentyohkwa’s root word curriculum has also been translated into four sister languages (Seneca, Oneida, Tuscarora, Cayuga) to be used to teach adult immersion language programming in the respective communities.

Six Nations Polytechnic - Bachelor of AOL

Six Nations Polytechnic (SNP) is a postsecondary organization within the territories of the Six Nations of the Grand River. SNP is an Indigenous-owned and controlled educational institution established in 1991 and since has created University Consortiums Articulations with McMaster University, Brock University, the University of Guelph, the University of Waterloo, University of Western Ontario, and Wilfrid Laurier University, where students are able to complete the first year of their undergraduate degree within the Six Nations community. SNP continued to build spaces for local ancestral knowledge to be woven with modern academic knowledge to strengthen preservation of the Cayuga language, and created the Indigenous Knowledge Centre known as Deyohahá:ge which translates to Two Roads in Cayuga. In 2016, SNP became the first to offer and create an Indigenous language university degree program in Canada, and now offers both the three year Bachelor of Arts in the Ogwehoweh Languages (BAOL) and an Ogwehoweh Language Diploma in both Cayuga and Mohawk. The creation of BAOL is a significant milestone and has enabled lifelong commitments to the revitalization of the language for many community members.

Ekowaamjigaadeg Inwewin - Language Nest

The Language Nest curriculum is a community based promotion and ill health prevention program developed for community members of The Chippewas of Nawash Unceded First Nation. The objective of the program is to deliver holistic community-based projects teaching the Anishaabemowin and thereby promoting and improving cultural, holistic, and community directed mental health at the community level. The Language Nest creates and circulates cultural resources and materials that will aid in developing positive attitudes, values and skills to connect with the root of the communities’ cultural heritage.

2.3.9 Management effectiveness. Obstacles encountered in the management/coordination of the Biosphere reserve or challenges to its effective functioning.

The failure from 2017 until early 2019 to engage Indigenous Peoples in effective governance processes delayed the successes achieved from 2020 to now. One of the challenges is to build trust with Indigenous Peoples of the Biosphere and one of the obstacles is the often ignored need to build capacity for co-governance in Ethical Space by the rights holders and stakeholders in all Biospheres in Canada. (See Section L and 2.3.5 for further details on Ethical Space.) The effectiveness of the management/coordination of the Biosphere under the Commission was evaluated during the last periodic review. The MAB ICC’s suggestions prompted consultations for a new Biosphere leader, who was grounded in the community of the Biosphere. Through numerous candid discussions and education on true engagement with Indigenous peoples, the formation of the Network was guided by the voices of the Indigenous and non-Indigenous communities and partners across the Biosphere and through this collaboration, is now a “network of networks”.

Provincial Review of the NEP and Commission

Over the last several years, the Commission has undergone also three independent reviews of its mandate, relevance, governance, value for money, sustainability, administrative efficiency and effectiveness:

1. Under the provincial government’s Agencies and Appointments Directive (January 2019), all provincial agencies are required to undergo a mandate review at least once every seven years. In 2017-18, the government procured the advisory services of the not-for-profit Institute on Governance to conduct the review of the Commission’s mandate. The purpose of the review was to assess if the Commission’s mandate remains relevant, is being met, and is being met in the most appropriate way. As part of the mandate review, the Commission’s governance and strategic documents were reviewed, and several MNRF and Commission staff and Commission members were interviewed. The results of the review were provided to the government in 2018-19 and the Commission was deemed to be meeting its mandate. Of note in the mandate review of the Niagara Escarpment Program, there was a recommendation on performance monitoring, and the report concluded that the inability to identify, analyze, and communicate the true environmental benefit of the Niagara Escarpment Plan was a missed opportunity to increase public support and appreciation.

2. In addition, in the fall of 2018, the government formed an Agency Review Task Force to review all provincial agencies for: relevance, governance, value for money, sustainability, administrative efficiency and effectiveness.

In 2019, the Commission underwent review through the provincially appointed Agency Review Taskforce which supported the continuation of the Commission and suggested enhancements be considered to further modernize the Niagara Escarpment Program and enhance implementation.

3. In 2022, the Ontario Auditor General's Office (OAGO) undertook a Value for Money Audit entitled 'Conserving the Niagara Escarpment', in which the Commission was a participant. The final report, released in late November 2022, highlighted key areas of improvement for the Commission and the MNRF, to which both the Commission and MNRF provided responses. This report concluded that there are not sufficient performance measures and targets to evaluate whether the objectives of the Act and NEP are being achieved. The Auditor asserts that insufficient financial and staffing resources are provided to the Commission to ensure that the Plan is effectively implemented and monitored to assess the state of the Escarpment.

In 2018-19, the Commission, in response to some of the findings of these reviews, developed a new Operational Strategy that focused on business and organizational effectiveness. It included a strategy to educate clients, regulatory partners, stakeholders, and Indigenous communities on the 2017 NEP and the Niagara Escarpment's UNESCO Biosphere Reserve designation.

There are several internal and external factors influencing the Commission being more effective and efficient. Internal factors include staff turnover, training and development, increased volume and complexity of work, the need for streamlining of internal processes, electronic and digital records management, and a need for enhanced agency and municipal collaboration. External influences include leveraging the work of modernization, e-government, and open for business strategies, as well as Indigenous engagement and consultation (from Commission Annual Report 2022-23).

The Commission also acknowledged in its response to the

Audit was that performance measurement is an effective and appropriate evaluation tool. The Commission recognizes that environmental monitoring and cumulative impacts would benefit in being integrated into a performance plan framework.

2.4 Comment on the following matters of special interest in regard to this Biosphere reserve: (Refer to other sections below where appropriate).

2.4.1 Is the Biosphere reserve addressed specifically in any local, regional or/and national development plan? If so, what plan(s)? Briefly describe such plans that have been completed or revised in the past 10 years.

In February 2015, the Province, under the lead of the Ministry of Municipal Affairs and the Ministry of Natural Resources and Forestry, began a co-ordinated review of the following four provincial land use plans:

- Growth Plan for the Greater Golden Horseshoe
- Greenbelt Plan
- Oak Ridges Moraine Conservation Plan
- Niagara Escarpment Plan

The four plans provide an integrated regional framework and work together to manage growth, protect our agricultural lands and the natural environment, and support economic development in Ontario's Greater Golden Horseshoe and Greenbelt. They encourage the development of compact, complete, and vibrant communities that make better use of our infrastructure and transit investments, and help to reduce greenhouse gas emissions. The updated NEP came into effect on June 1, 2017. Since the 1990 designation as a world Biosphere, the NEP has included recognition of this designation in the prologue of the plan.

In the NEP 2017, this is the reference to the Biosphere:

In 1990, the United Nations Educational, Scientific and Cultural Organization (UNESCO) named Ontario's Niagara Escarpment a World Biosphere Reserve.

This designation recognizes the Escarpment and land in its vicinity as a nationally and internationally significant landform, and endorses the Niagara Escarpment Plan.

This Plan is Canada’s first, large-scale environmental land use plan. Implementation of this Plan upholds the Biosphere reserve principles by balancing protection, conservation and sustainable development to ensure that the Escarpment will remain substantially as a natural environment for future generations, and by promoting collaboration and providing opportunities for research, monitoring and education.

Collectively, UNESCO Biosphere Reserves form an international network of sites of excellence that collectively work to ensure environmental, economic and social (including cultural) sustainability, acting as demonstration areas and learning sites with the aim of maintaining and developing ecological and cultural diversity, and protecting ecosystem services for human well-being.

All municipal official plans include maps of where the NEP is the governing land use document. While an exhaustive search of local, regional and national plans was not completed for this review question, it should be noted that the City of Hamilton does refer to the Biosphere in its Hamilton Biodiversity Conservation Plan described below.

Brock University celebrates its location within the Biosphere by flying the flag of UNESCO and notes on its website: “Brock is located atop the Niagara Escarpment. This positions our campus in a beautiful natural setting featuring a diverse ecosystem and stunning views. In fact, Brock’s location is so special that it has been designated a UNESCO Biosphere Reserve”.

Hamilton Biodiversity Conservation Plan

The City of Hamilton is creating a city-wide, multi-stakeholder action plan and strategy to maintain and steward their biodiversity and ensure Hamilton’s natural environment and biodiversity will be protected and enhanced for future generations. Hamilton acknowledges it is a part of a greater biological diverse network within the Biosphere. The Biosphere is illustrated in the plan as traveling through the City of Hamilton “providing a ribbon of green and separating the lower and upper city”. The section of the Biosphere within the Hamilton region is home to ecologically significant and diverse ecosystems, including habitat of endangered species such as the Jefferson Salamanders and Blanding’s Turtles. Hamilton commits to maintain the integrity of the biodiversity and ecosystems within the Biosphere, and to “promote solutions to live, work and play in and around important natural areas so that biodiversity is conserved and enjoyed sustainably”.

2.4.2 Outcomes of management/cooperation plans of government agencies and other organizations in the Biosphere reserve.

[The Niagara Escarpment Parks and Open Space System](#) (NEPOSS) consists of publicly-owned parks and open spaces acquired to protect the Escarpment’s natural and cultural heritage. See Map 2.4.2x (NEPOSS) below. Largely connected by the Bruce Trail, lands within NEPOSS are owned by a number of partner agencies including the Ministry of Natural Resources, conservation authorities, Ontario Heritage Trust, the Escarpment Biosphere Conservancy, and the Bruce Trail Conservancy. Part 3 of the NEP contains policies that guide activities and development within the NEPOSS.

The NEPOSS Council is made up of representatives of the public land owners in the Biosphere. It was created in recognition of the need to foster dialogue on NEPOSS issues and improve communication, shared resources, and coordinated action among various NEPOSS agencies. Council representatives work collaboratively to further NEPOSS objectives such as promoting land acquisition and public access. Two major objectives of the NEPOSS are to complete a system of publicly-owned parks and open spaces and to secure a permanent route for the Bruce Trail through additional land acquisition. A total of 22 new properties were added to the system over the last 10 years.

Lands within the System are managed in accordance with the policies and objectives of the NEP. The NEPOSS Planning Manual provides guidance to park and open space agencies/bodies on the planning, development, and implementation of management plans. The 2012 Manual was updated in 2021 with the input of NEPOSS Council members. Please refer to Section F for a description of the NEPOSS Council. A list of the significant achievements made over the last 10 years are included in Annex VIII.

2.4.3 Continued involvement of local people in the work of the Biosphere reserve. Which communities, groups, etc. How are they involved?

The NEPOSS Council is a good example of local people/ organizations involved in the work of the Biosphere. Members include public park and natural space agencies that own and/or manage land in the NEPOSS and provide a strong geographic representation to ensure the diverse needs of the park agencies are met. The Council meets at least two times a year to discuss parks and open spaces management issues. The Council provides advice to the MNRF and the Commission on NEPOSS policies and programs and brings awareness about common issues.

Members include public park and natural space agencies that own and/or manage land in the NEPOSS and provide a strong geographic representation to ensure the diverse needs of the park agencies are met. Both the MNR and Commission staff serve as non-voting advisors. The strength and public image of the NEPOSS is dependent upon the cooperation of the NEPOSS agencies in complying with the policies of the NEP. The Council remains an important contributor to the work of the Biosphere.

As the shift from the Commission as the convenor for the Biosphere to the Network takes hold, opportunities for enhanced conversations, collaboration and connections are becoming realized. As the Network reaches out and engages with Escarpment communities, it is evident that there is both opportunity and desire to build community through the lens of the Biosphere designation. As these relationships evolve, the idea of the Biosphere as a learning landscape for sustainability, the Sustainable Development Goal, the Kunming Montreal Global Biodiversity Framework, and numerous other international agreements and frameworks are exciting and intriguing. Partners and local communities play a diverse role in achieving the Biosphere's objectives. Notably, organizations like the Bruce Trail Conservancy (BTC) and Escarpment Biosphere Conservancy (EBC) actively engage in acquiring and safeguarding land across the Biosphere. See 4.2 for more details.

Similarly, there is active involvement of universities and colleges in the Biosphere through field courses, research projects and learning on the escarpment. See 6.4 for more information. The Network highly regards the input of our partners and continues to extend invitations to them for key planning meetings such as the annual general meeting (AGM), to facilitate and initiate discussion surrounding the objectives of the Biosphere. At the recent AGM, over 40% of attendees were from NGOs, and provided important insights on the state of the biosphere. See 7.5.6 for more details on the AGM. The Network's commitment to fostering collaboration and engaging diverse partners reflects a shared dedication to achieving the objectives of the Biosphere, making strides toward a sustainable future.

2.4.4 Women's roles. Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration within the Biosphere reserve? What incentives or programmes are in place to encourage their representation and participation? (e.g. was a "gender impact assessment" carried out?) Are there any studies that examine a) whether men and women

have different access to and control over sources of income and b) which sources of income do women control? If so, provide reference of these studies and/or a paper copy in an annex.

Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration within the Biosphere reserve?

Canada is a free and democratic society; there are no legal barriers that prohibit women's participation in community organizations and decision-making processes, including within the Biosphere. However, the reality is that underrepresented groups including women, racialized persons, LGBTQ2+ peoples, Indigenous Peoples, and people living with disabilities have different degrees of community participation, and decision-making experiences across Canada, despite government interventions. An example is shown by the Government of Canada, which is very clear in its equity, diversity, and inclusion (EDI) expectations for institutions, agencies, and businesses, whereby all must strive to put in place the right conditions for each individual so that they can reach their full potential, unimpeded by inequitable practices (Government of Canada, 2019). The government's commitment to EDI is further demonstrated through its recent establishment of the 50 – 30 Challenge, an EDI initiative co-created by the Government of Canada, civil society, and the private sector that aims to attain gender parity (50%) and significant representation (at least 30%) of underrepresented groups in Canadian leadership and management positions. However, it is important to note that a lot of work needs to be done at the operational level, especially with respect to Indigenous Peoples and women in leadership and decision-making roles (Statistics Canada, 2021; Canadian Women's Foundation, 2023).

Women make up just over half of the Canadian population yet continue to be underrepresented in political and professional leadership positions. Although men and women should have the same career opportunities, research shows women are at a greater career disadvantage than men due to career interruptions (family obligations, maternity, parental leave), workload, discrimination, stereotyping, and gender biases (Statistics Canada, 2019).

Looking specifically at Canadian politics and leadership careers, despite years of interventions geared at promoting EDI in the Canadian workforce, the gender gap remains wide. In Canada, historically excluded peoples and groups are severely underrepresented in politics, with less than

25% of municipal appointments held by women, and this number becomes so much further reduced for racialized minorities and Indigenous Peoples, accounting for only 4% of the 2014 municipal election, with the 2018 statistics not even readily available (Phillips & Pennisi, 2020).

Looking at the political landscape of the Niagara Escarpment Biosphere, women are underrepresented in all but 3 out of 27 political decision making bodies. Within the Biosphere, women occupy 33% of regional and municipal political positions, with 33% of Mayor and Chair positions held by women. This is well below Canada's goal of 50%. Within the Biosphere, women do slightly better at the provincial and federal government level, with women making up 42% of Provincial Parliament seats and holding 32% of Federal Parliament seats. This is a combined total of women holding 37% of federal and provincial seats within the Biosphere (Statistics Canada, 2022).

Are women's interests and needs given equal consideration within the Biosphere? The answer is yes. Recognizing women's participation in community organizations and decision-making processes in the Biosphere is multifaceted. Their contributions span leadership, conservation efforts, education, advocacy, and community engagement, all of which are essential for the ongoing protection and sustainable management of the Biosphere. Although there is more work to do, the Biosphere sees a higher participation rate by women than the national Canadian average where women hold only 18% of mayors' positions (Biosphere holds 33%) and 28% of councillors' seats (Biosphere holds 33%) in Canada (Statistics Canada, 2022). Recognizing and promoting gender equality, especially at the political level, in these roles is crucial for achieving the Biosphere's environmental goals and ensuring a more inclusive and equitable future.

Table 2.4.4. A: Women’s Roles – Regional and Municipal Political Landscape

Governing Body	Women on Council	Men on Council	Women by %	Leadership (Mayor /Chair)
Regional Government				
Niagara Region	9	23	28	Male
Halton Region	9	14	64	Male
Peel Region	8	17	47	Male
Municipal Government				
St. Catharines	2	11	15	Male
Niagara Falls	3	6	33	Male
Niagara-on-the-lake (mayor is a woman)	3	5	38	Male
Thorold	1	8	11	Male
Pelham	1	6	14	Male
Lincoln (mayor is a woman)	4	5	44	Female
West Lincoln	5	4	56	Female
Grimsby	4	5	44	Male
Hamilton (mayor is a woman)	5	11	45	Female
City of Burlington (mayor is/was a woman)	3	4	43	Female
Caledon	3	6	33	Female
Mono	3	5	38	Male
Mulmur	3	2	60	Female
Melancthon	1	4	20	Male
Grey Highlands	1	6	14	Male
Clearwater	3	5	38	Male
Collingwood (mayor is a woman)	3	6	33	Female
Blue Mountain	4	3	57	Female
Chatsworth	1	4	20	Male
Georgian Bluffs	3	4	43	Female
Meaford	1	6	14	Male
City of Owen Sound	4	5	44	Male
Town of S. Bruce Peninsula	1	3	25	Male
Town of N. Bruce Peninsula	1	4	20	Male
Total	89	182	33% women	9 Women (33%) 18 Men

Table 2.4.4.B: Women’s Roles – Provincial and Federal Political Landscape

Governing Body	Woman Representative	Man Representative	Women by %
Provincial Parliament	8	11	42
Federal Parliament	6	13	32
Total	14	24	37

Case Study – Seat at the Table – Niagara Region

In the Niagara region, the Women’s Advisory Committee was established by the Regional Council to consider ways to address the underrepresentation of women in public office, on corporate boards, and in leadership positions. Despite being just over half of the Niagara population, women are underrepresented in local government, especially in senior leadership. On Regional Council, 25 percent of councillors are women and no apparent visible minorities serve on Niagara Region or local municipal councils.

Niagara Region’s Seat at the Table program aims to address barriers that women face running for municipal office and to improve the environment once elected. The goal is to increase the number of women, particularly underrepresented women, elected for municipal government in Niagara by promoting understanding, awareness and confidence through education, mentorship, and support to those interested in running for election.

The program consists of four workshops that will help women and underrepresented groups feel informed and educated when making the decision to run for local government. Seat at the Table provides participants with the knowledge and skills to run a successful campaign, and if elected, support throughout their term. This initiative is funded by Women and Gender Equality Canada in partnership with the Federation of Canadian Municipalities and the Greater Niagara Chamber of Commerce, Women in Niagara, City of St. Catharines, Young Women’s Christian Association (YWCA), Future Black Female, Services 4 Humanity, Muslim Senior Circle, and the Niagara Region’s Women’s Advisory Committee.

The work of the Network recognizes that under-representation and inadequate representation in leadership and decision-making contributes to ongoing marginalization and inequality (Kamalnath, 2018). Without meaningful representation, policies, programs, and plans will fail to adequately consider the intersectional impacts of decisions. The Network’s Two-Eyed Seeing co-governance structure, with strong commitments to EDI, is a remedy for this situation. With a Board of Directors approaching gender parity and balance with respect to Indigenous representation, objectivity, creativity, innovation, and fiscal responsibility will increase which will strengthen governance performance. (Parker et al., 2015; Kamalnath, 2018).

Niagara Escarpment Biosphere Network Board of Directors – October 1, 2023

Table 2.4.4.C: Composition by Gender and Origin

Name	Notes
Charlene Winger	Co-Chair (female, Indigenous)
Norm Ragetlie	Co-Chair (male, non-Indigenous)
Victoria Serda	Female, non-Indigenous
Liette Vasseur	Female, non-Indigenous
Mark Zelinski	Male, non-Indigenous
Walter Sendzik	Male, non-Indigenous
Larry McDermott	Male, Indigenous
Tim Johnson	Male, Indigenous
Josh Eshkawkogan	Male, Indigenous
Caley Doran	Male, Indigenous
Jeff Barrett	Male, non-Indigenous
Leslie Adams	Female, non-Indigenous
Kerry Kennedy	Female, non-Indigenous

Male:Female ratio = 8:5 or 60/40

Non-Indigenous:Indigenous ratio = 8:5 or 60/40

Increasing diverse women’s representation in leadership is key to advancing gender justice in Canada (Government of Canada, 2019). The governance structure of the Biosphere is an excellent case-study example to highlight a diversity of perspectives and ways of knowing as essential to successfully guide good governance and management. Building open and inclusive participation processes where everyone has an equal chance at participating is key to creating fair and equitable processes for all genders.

Credit Valley Conservation Case Study - Women are gaining ground in conservation

The Couchiching Conservancy, protecting nature for future generations

International Women’s Day is a special opportunity to celebrate the accomplishments and resilience of women in our lives. Always a special day, it has become even more important now than it was three short years ago. The pandemic was a concentrated reminder that external stressors on families mean a rise in gender based violence, and sacrifices made by women for the family, with inordinate numbers of women leaving the workforce. Many mothers were forced into the impossible juggling act of working and organizing virtual school – two full time jobs. The pandemic was a climate related event, as its root was in habitat loss and encroachment. Like other catastrophes caused by the climate crisis, women experienced compound effects. The volume of research to prove this correlation would take years to read; flooding, fires and the loss

of arable land all affect women disproportionately. This is just one of many reasons why conservation and environmentalism are so important. Climate justice is social justice.

In the world of conservation, women's empowerment is essential to success. According to the UN, at the local level the participation of women in natural resource management is associated with better resource governance and conservation outcomes. In the world of conservation, women's empowerment is essential to success.

The Couchiching Conservancy has a continuing legacy of providing women with positions of power within the organization. The 2023 Annual General Meeting brought a new female president, to lead the Conservancy into the future, with a female Executive Director by her side.

The Conservancy has gained from the talent, intelligence, and energy of women who come through our doors, both as volunteers and staff.

What incentives or programmes are in place to encourage women's representation and participation? (e.g. was a "gender impact assessment" carried out?) Are there any studies that examine a) whether men and women have different access to and control over sources of income and b) which sources of income do women control? If so, provide reference of these studies and/or a paper copy in an annex.

Statistics Canada regularly collects and publishes data related to income, employment, and gender. Their reports and surveys often include information on gender disparities in income and workforce participation. Currently, women in Canada hold about a third (35.6%) of management occupations, and 30.9% of senior management level occupations. Just 4% of Canada's largest publicly traded companies have a woman CEO, and in Canadian corporations, women hold 18.3% of board member positions (Statistics Canada, 2021). Currently women make .89 cents to every dollar a man makes in Canada. Although a lot of progress has been made, there is still much work to be done.

For the Biosphere, significant progress has been made to mitigate the barriers that are known to activate gender disparities.

Leadership Roles: Women actively serve in leadership positions within community organizations and agencies related to the Biosphere. They may hold positions such as executive directors, board members, and committee chairs, providing valuable input into organizational strategies and decisions.

Advocacy and Policy Development: Women participate in advocacy efforts, advocating for policies and regulations that protect the Biosphere's ecosystems. They work with local, regional, and national authorities to influence decisions related to land use, zoning, and environmental regulations. Look no further than Conservation Ontario, the umbrella organization for the 36 Ontario Conservation Authorities. Not only has the organization been under female leadership for over 15 years, the majority of leadership, policy, and planning positions in the organization are occupied by women. This is significant to the Biosphere, as nine Conservation Authority areas of jurisdiction fall within the Biosphere boundary.

Good Governance - Niagara Region as a Case Study

Canadian municipalities play an increasingly key role in addressing social issues, particularly those associated with EDI in a context of growing urbanization and rapid demographic changes.

The Regional Municipality of Niagara (Ontario) understands a diversity of perspectives is essential to successfully guide economies; when diversity is not realized, innovation and discovery suffer. To show their EDI commitment, in 2019, the Regional Municipality of Niagara became a member of the Canadian Coalition of Inclusive Municipalities (CCIM) network. In Canada, 96 cities are members of CCIM, an initiative to bring together municipalities to improve their policies against racism, discrimination, exclusion, and intolerance. Member municipalities undertake initiatives to eliminate all forms of discrimination with a view to building open and inclusive societies where everyone has an equal chance at participating in its economic, political, social, cultural, and recreational life.

The other Canadian Coalition of Inclusive Municipalities in the Biosphere include Hamilton, Peel, Halton and Caledon.

Environmental Stewardship: Women are engaged in on-the-ground environmental stewardship efforts, participating in activities such as habitat restoration, tree planting, and wildlife monitoring. These hands-on activities contribute to the conservation and preservation of the Biosphere's natural resources.

Education and Outreach: Women often lead educational and outreach programs aimed at raising awareness about environmental issues and the importance of the Biosphere. They may conduct workshops, school presentations, and community events to engage the public and inspire environmental action.

Indigenous and Traditional Knowledge: Indigenous women, in particular, play a crucial role in preserving and passing down traditional ecological knowledge. Their expertise and insights into sustainable land use practices are vital for the Biosphere’s conservation efforts.

Community Engagement: Women often lead community engagement initiatives, fostering dialogue and collaboration among diverse partners. They organize community meetings, workshops, and forums to gather input, share information, and build consensus on environmental issues.

The Bagida’waad Alliance as a case study

The Bagida’waad Alliance, led by Chippewas of Nawash Fishing Families, is registered as a not-for-profit corporation (2018) and based on the Chippewas of Nawash Unceded First Nation at Neyaashiinigiing, Ontario, which is surrounded by Niagara Escarpment bluffs: Jones Bluff, Kings Point and Malcolm’s Bluff. Bagida’waad means “they set a net” in Anishinaabemowin.

Bagida’waad was founded by Natasha Akiwenzie, who is also the former co-owner of Akiwenzie’s Fish & More with her husband Andrew. She is an experienced business entrepreneur, having run a successful provincially-regulated fish processing plant and award-winning community supported fishery for 15 years. The Akiwenzies sold their fresh, frozen, and smoked fish at Toronto Farmers Markets until the collapse of the lake whitefish in Georgian Bay. They left their business in 2018 to address climate change and support the transition of fishing families to land- and water-based education and activities. Natasha has a published autoethnography through the Canadian Climate Institute about her experiences with climate change, the fisheries, and forming the Bagida’waad Alliance.

With a governance structure of four Indigenous and three non-Indigenous directors, Bagida’waad focuses on the following:

- Conducting climate research on the waters of Lake Huron and Georgian Bay,
- Encouraging youth to hear the stories of the Elders about the fish, and,
- Undertaking active stewardship of the lands and waters.

The Bagida’waad Alliance is a grassroots organization that includes a majority of members of the Saugeen Ojibway Nation, whose traditional territory is over 1.5 million acres, including the majority of the Niagara Escarpment in Southern Ontario. Saukiing Anishinaabekiing territory

extends from near Thornbury on Georgian Bay around the Saugeen (Bruce) Peninsula and down Lake Huron past Goderich.

A Sample of Projects:

The Bagida’waad Alliance has run many successful projects, with over one million dollars of programming over the first five years. One of the first projects was a pair of net seaming workshops hosted in Neyaashiinigiing, including one for students at Kikendaasogamig Elementary School. This workshop gave hands-on experience about the gill nets used by fishers. Two pottery workshops were hosted, including one that focussed around collecting clay in Neyaashiinigiing. Many of the workshops are asked to be repeated.

Bagida’waad has produced a few mini-documentaries, is working on a book of stories, and has run a film school for Anishinaabek youth in our region.

Another successful and meaningful project had youth creating a recording of Elders, who shared their story of when they were young. The video was shown at a dinner that the youth and Elders attended, where they played card games and did puzzles together. The Elders have asked for this project to be continued, as they enjoyed it immensely. Bagida’waad Alliance has also hosted a Celebration of Fishers that had games, a gourmet dinner from top chefs, a dance, and Anishinaabek singers. It was really enjoyed by both community and non-community members.

Centennial College students came to Neyaashiinigiing for a land-based learning opportunity, including hiking on and near the Niagara Escarpment, working with livestock, listening, and learning from Elders from Neyaashiinigiing. This five day experience was described as life changing by the participants.

Third year students from the University of Toronto, Scarborough Campus, completed a Land-Based Learning and the Arts course, featuring hiking along the Niagara Escarpment with Anishinaabek youth guides. This course will run again in 2024.

The Jane Goodall Institute’s Youth Action Council has come to Neyaashiinigiing twice, as part of their annual retreat, in order for the Council members to gain experience in understanding more about Indigenous worldviews and, in addition, to hike the Niagara Escarpment with Anishinaabek youth guide leaders.

Around 50 interviews with Elders and knowledge keepers in the Saugeen Ojibway Nation have been completed

about whitefish, as well as other species at risk on the land and water. In particular, there has been monitoring of the globally significant alvars in the Escarpment buffer zone that supports unique biodiversity, including species at risk such as western chorus frogs, eastern whip-poor-will, eastern meadowlark, little and big brown myotis, American elm, and golden eagles. Neyaashiinigiing is monitored extensively, and a long list of species at risk have been identified, such as the eastern ribbon snake, snapping turtle, butternut, barn swallows, American Hart's-tongue fern, dwarf lake iris, eastern wood-pewee, eastern milk snake, eastern painted turtle, American bumblebee, monarch butterfly, and black ash. Part of the biodiversity is due to the Niagara Escarpment being a significant migratory bird pathway, as well as having microclimates for a variety of unique species, significant karst systems, and the dolomite stone creating an alkaline ecosystem base.

Natasha Akiwenzie has organized many workshops and activities around Ontario, from climate action and water testing to beach clean ups and youth action, and she has been interviewed numerous times for magazines and news outlets, including the Canadian Broadcasting Corporation.

The team has also done many presentations, including most recently at the Latornell Conservation Symposium, explaining how climate change is affecting Lake Huron and the Saugeen Peninsula, with calls to action and programs to engage people on an ongoing basis. Other presentations include: Great Lakes Research Alliance for the Study of Aboriginal Arts & Cultures Conference, Sources of Knowledge Forum, Youth Climate Action Conference in Owen Sound, and the Lake Huron Coastal Centre Conference. The team has hosted online webinars and chats throughout the pandemic, and has started a social enterprise, Miigwewin, that includes an accommodations trailer to host trainers and students and advertises guided hikes along the Escarpment. Bagida'waad also works with the Bruce Trail Conservancy on biodiversity initiatives. They have had from two to seven youth hired for the last few years to experience a variety of environmental related work opportunities. They do guided hikes with students from the Bruce Peninsula District School at Lion's Head, which is a member of UNESCO's Associate School Project Network, and bring Elders to teach Indigenous diplomacy and share knowledge.

Presently, six Aki Guardian youth are training to become Eco-tourism guides through a post-secondary curriculum that another one of our youth staff has customized and delivered to meet our organization's vision. Training is also

offered around identifying safety, species at risk, carbon and ecosystem services calculations, photography and film-making, wilderness first aid, interpretation, sustainability practices, GIS storymapping, and more, with much of the field work done in or around the Niagara Escarpment. Seventeen of the Sustainable Development Goals are actively worked upon through Bagida'waad's programs.

Hundreds of workshops have been held, including such topics as:

- Fishing Net Seaming
- Citizen Science Water Testing
- Black Ash Basket Making
- Species at Risk research
- Reconnecting with Land & Water
- Learning Anishinaabemowin
- Climate Change & Nature-Based Solutions
- Anishinaabe diplomacy

The Niagara Escarpment Biosphere designation is important to the members of the Bagida'waad Alliance since it helps to protect part of an old Anishinaabe footpath, which is now often known as the Bruce Trail. This trail is part of the pre-contact trade route that ran from northern Ontario down into the United States, and still has a significant amount of Anishinaabek Marker Trees. It has some of the oldest trees in Ontario (ancient cedars), and significant amounts of species at risk that require protection, especially with climate change and increasing human activity such as quarries and development. This globally significant flyway and ecosystem corridor needs to retain its designation in order to protect biodiversity and offer pockets of resilience to climate change.

2.4.5 Are there any changes in the main protection regime of the core area(s) and of the buffer zone(s)?

Changes in NEP protections resulting from the updated NEP 2017 are summarized in 7.7.1.

2.4.6 What research and monitoring activities have been undertaken in the Biosphere reserve by local universities, government agencies, stakeholders and/or linked with national and international programs?

The Biosphere, characterized by its rich biodiversity and distinctive geographic features, hosts a diverse array of research and monitoring initiatives involving various agencies and individuals. These activities span multiple domains, including biodiversity, ecosystem health,

sustainable development, invasive species, and community engagement. Given the bi-national nature of the Niagara Escarpment, which extends across parts of New York state and Michigan, numerous internationally linked research and monitoring projects are underway. Notably, the Biosphere is closely connected to bi-national efforts, such as the Areas of Concern – Remedial Action Plans for the Niagara River and Hamilton Harbour.

The Biosphere at Queenston holds significance as part of the Niagara River Ramsar Wetland of International Importance. While the Canadian side awaits designation, the U.S. side received designation in 2019. A robust synergy and collaboration exist between the Biosphere and the Ramsar bi-national Steering Committee, as well as the Remedial Action Plans. This collaboration is further reinforced by shared expertise among some members who contribute to all programs. The academic sector also plays a vital role, with strong connections between the Biosphere and four post-secondary institutions in the corridor: Brock University, University of Buffalo, Niagara College, and Niagara University. Furthermore, in the Niagara Region, the Aspiring Geopark is actively pursuing UNESCO Geopark status, drawing global attention to the Niagara Escarpment's unique and captivating geoheritage. This collective effort underscores the commitment to preserving and understanding the ecological and cultural significance of the Niagara Escarpment.

Nestled within the Great Lakes Basin, the Biosphere stands out as a prime location for bird migration. The Biosphere boasts five globally significant Important Bird Areas: the Niagara River Corridor, Short Hills Provincial Park, and the Upper Twelve Mile Creek watershed; the west end of Lake Ontario at Hamilton Harbour; Dundas Valley Marsh; and Cabot Head. Moreover, the Biosphere features eleven partners in the Motus Network of telemetry stations. The Motus Wildlife Tracking System serves as a global collaborative research network utilizing coordinated automated radio telemetry. Its mission is to advance research and education on the ecology and conservation of migratory animals. Operating under the auspices of Birds Canada, Motus collaborates with researchers and organizations worldwide to contribute to a deeper understanding of migratory patterns and behaviors. The Biosphere Motus stations are strategically positioned at Niagara College, Brock University, Hamilton Harbour, Campbellville, Forks of the Credit Provincial Park, Mono Cliffs Provincial Park, the Highland Meadows Farm area, Meaford, Inglis Falls, Cabot Head Provincial Nature Reserve, and Fathom Five National Marine Park.

The following Table 2.4.6 provides a summary of research and monitoring activities that have been undertaken in the Biosphere by local universities, colleges, government agencies, conservation groups, traditional knowledge keepers, and other agencies.

Table 2.4.6. Network Research Network Partners Summary

Researcher / Knowledge Holder	Research & Monitoring Activities	National / International linkages
Universities and Colleges		
Brock University	Biosphere co-governance	UNESCO Chair on Community Sustainability: from Local to Global at Brock since 2014
	Ecosystem services in biospheres – assessment and adaptation	
	Biodiversity monitoring as a biosphere assessment tool	
	Brock partnered with Plenty Canada to study Indigenous plants on Laura Secord trail / Niagara Escarpment	Supports environmental protection and global sustainable development goals.
	Evaluating ecological outcomes from environmental stewardship initiatives	The evaluation of ecological outcomes from environmental stewardship initiatives has global implications for biodiversity conservation including protection of endangered species.
Studying the Anthropocene at Crawford Lake	In the global quest to pinpoint the onset of a new epoch, Crawford Lake in the NEB has been identified as a significant geological landmark. Abundant evidence illustrates the widespread impact of human activities on the environment.	
Niagara College	Monitoring flora and fauna in the NEB using iNaturalist identification tool to document species types and distribution across the entire Biosphere boundary.	iNaturalist is a global application linking collected data across the globe. Contributions from the NEB community include over 180,000 observations with over 6,800 species.
	Monitoring migratory birds through Bird Canada’s Motus Tower program	Niagara College’s Motus tower tracks the flight patterns of migratory birds and works in conjunction with hundreds of others across North and South America to document flight patterns.
	<i>Phragmites australis</i> , monitoring whereby ecosystem restoration program students identified and mapping 6 acres of the invasive reed. Mitigation efforts are underway for eradication.	As one of the most invasive species in Canada, Niagara College is using a hands-on learning approach looking at several eradication techniques for monitoring and extension services.
Redeemer University	Validation of accuracy and consistency of tree identification apps; Using PlantNet and iNaturalist app in Field Biology course.	Global applications linking collected data across the globe.

Six Nations Polytechnic	Great Niagara Escarpment Indigenous Cultural Map	See Plenty Canada below
University of Waterloo	Climate Risk Research Group is an interdisciplinary team working to support climate change adaptation through collaborative research.	Developed strategies feed into the global community of climate researchers to help inform climate resiliency strategies such as nature-based solutions, innovative technology, and land use policy changes.
	Managing for Ecosystem Resiliency. Environment, Resources & Sustainability at U Waterloo - 3-week field course from 1995-2017 dedicated to monitoring sites within NEB using the UNESCO MAB protocol. It ended because of provincial restrictions. Followed by 2018-2019 work on MAB using a modified protocol ended by pandemic.	UNESCO MAB international linkages and data sharing. The use of scenario building in Bruce Peninsula National Park can offer insights into effective climate change adaptation strategies for forests. These insights may have applicability in other international parks and protected areas facing similar climate-related challenges.
	Forest health-based scenario building as an accessible tool for climate change management in Bruce Peninsula National Park.	
University of Guelph	Soil Health Institute	Document, celebrate, and safeguard important Indigenous heritage resources on and along the Niagara Escarpment. Promotes collaboration between researchers, scientists, environmental organizations, and citizen scientists.
	Conservation through Reconciliation Partnership and Conservation Leadership program	
	Ontario Tree Atlas Project	
University of Toronto	Research (Forests in Settled & Urban Landscapes) to understand the distribution and abundance of invasive plant species in southern Ontario forests	A standardized vegetation sampling protocol allows for consistent monitoring of forest biodiversity. Shared protocols enable the collection of comparable data globally, facilitating international assessments of biodiversity trends and informing conservation strategies.
	Forest Vegetation Sampling Protocol.	
	Rock Climbing and Talus Vegetation on the Niagara Escarpment: Impacts and Management Implementations	Sharing best practices and management implementations can help establish standards for sustainable climbing practices globally.
Mohawk College	The Joyce Centre for Partnership & Innovation incorporates leading-edge energy harvesting and conservation technologies and techniques.	At 96,000 square feet, the \$54-million Centre is Hamilton's first zero-carbon institutional building, and one of the largest in Canada.

Georgian College – Owen Sound Campus	International Marine Training and Research Centre	An international leader in marine innovation, customized training, research and development.
Queens University	Assessing water resource management in provincial land use planning policies in peri-urban regions of Southern Ontario	Best practices in land use planning policies that balance urban development with water conservation and protection. Such practices can be valuable for regions worldwide seeking sustainable land use planning solutions.
Wilfrid Laurier University	Centre for Sustainable Food Systems	Indigenous and government partners to implement research-based adaptive programs and lead monitoring initiatives encouraging stewardship of the land.
McMaster University	Fractures in the Niagara Escarpment in Ontario, Canada: distribution, connectivity, and geohazard implications.	Insights into the distribution and connectivity of fractures in the Niagara Escarpment can contribute to the global understanding of fracture networks in other geological settings. This knowledge can aid geologists and researchers worldwide in characterizing and assessing the geohazard potential associated with fractures.
	GeoTrails program working with the Bruce Trail Conservancy and Association of Professional Geoscientists Education Foundation and Niagara Geopark.	Supports environmental protection and global sustainable development goals, under UNESCO.
Government Agencies		
Ministry of Natural Resources & Forestry	Lead for the Ontario Invasive Species Strategic Plan. The objectives of this Strategic Plan are to prevent new invaders from arriving and surviving in Ontario, to slow and where possible reverse the spread of existing invasive species, and to reduce the harmful impacts of existing invasive species	This Strategic Plan also emphasizes the need for collaboration and coordination with neighbouring jurisdictions (other Canadian provinces and U.S. states) and the federal government, especially in research, monitoring, and enforcement.
	Natural Heritage Information Centre conducts research and surveys for priority species and areas across including areas of the NEB.	American black bears on the Saugeen Bruce Peninsula are genetically unique from neighbouring populations in Ontario and the US.
Ministry of Environment Conservation & Parks	The Source Water Protection Information Atlas; Species at risk assessment.	There are at least 70 different types of species at risk in the NEB, including several globally rare

		habitat types, as well as eastern North America's oldest forests.
Environment and Climate Change Canada	How Much Habitat is Enough performance indicators	National standards for natural heritage feature indicators
Parks Canada	Monitoring of sites to maintain ecological integrity in Bruce Peninsula National Park	Canada National Parks Act
Ontario Parks	Monitoring for species at risk to maintain ecological integrity at NEB parks such as Mono Cliffs Provincial Park (garlic mustard) and Short Hills Provincial Park (Japanese stiltgrass)	State of Ontario's Protected Areas Indicator Report 2021
Niagara Escarpment Commission	One Monitoring Program, although ended in 2018, hosts 20 years of monitoring data.	Collaborative partnership with researchers and organizations across Ontario.
Niagara Parks Commission (NPC)	Forestry Management Strategy sets research-based goals to increase forest cover in their land holdings from the current 28% to the desired 30%.	This supports the objectives of the Niagara River Corridor is an International Important Bird Area and as a federally listed Area of Concern.
	Species at risk monitoring and recovery plans.	The Niagara River Corridor is an aspiring Ramsar Site on the Canadian side with the US side designated in 2019. NPC property supports multiple species that support this designation including the endangered Northern Dusky Salamander.
Birds Canada	The Motus Wildlife Tracking System serves as a global collaborative research network utilizing coordinated automated radio telemetry to advance research and education on the ecology and conservation of migratory animals. There are five towers in the NEB.	Operating under Birds Canada, Motus collaborates with researchers and organizations worldwide to understand migratory patterns and behaviors.
Conservation Organizations		
Conservation Ontario	Source Water Protection Monitoring, as a group, the 36 CAs are in charge of monitoring and implementation of the provinces 38 source water protection plans* with Severn Sound and Bruce County the remaining two.	Clean, Sustainable Water is Essential The Great Lakes supply 80% of Ontarians with drinking water.
	As a group, conservation authorities have been publishing watershed report cards once every five years since 2013 with monitoring at 656 groundwater sites, 976 surface water sites, 802 benthic monitoring sites.	Focus natural resource management actions where they are needed most, and track progress over time. Watershed report cards provide common reporting metrics to enhance the comparability of data across

		regions, facilitating international collaboration and benchmarking
Niagara Peninsula Conservation Authority	Conveyor of Niagara River Remedial Action Plan (RAP); Watershed report cards for 2012, 2017, 2023 measuring surface and ground water quality, and forest Conditions.	Great Lakes Area of Concern network
Hamilton Conservation Authority	Watershed report cards for 2007, 2013, 2018, 2023 measuring impervious surfaces, surface water quality, forest Conditions, wetlands, riparian	Facilitate international collaboration and benchmarking
Conservation Halton	Conveyor of Hamilton Harbour Remedial Action Plan (RAP); 2013, 2018, 2023 watershed report card.	Great Lakes Area of Concern network
Credit Valley Conservation	Integrated Watershed Monitoring Program (IWMP) is a long-term monitoring program that reports on the health of ecosystems in the Credit River Watershed; Climate change vulnerability assessment of forest plants in the Credit River watershed: An application of NatureServe's CCVI tool; 2013, 2018, 2023 watershed report card.	The IWMP's approach to assessing and reporting on the health of ecosystems can serve as a model for other regions worldwide.
Toronto and Region Conservation Authority	Watershed and Ecosystems Reporting Hub allows users to interactively explore information about the TRCA watershed; publish a quarterly E Newsletter called monitoring matters	The reporting hub showcases best practices in watershed management. International organizations and other regions facing similar challenges can improve their own watershed management strategies.
Nottawasaga Valley Conservation Authority	Watershed Monitoring program monitors natural resources including the status of fish and benthic macroinvertebrate populations	Improved trout habitat and water quality in Black Ash Creek by removing the Petun Dam and restoring 130 m of stream channel and Niagara Escarpment valley
Grey Sauble Conservation Authority	Surface water quality sampling is done 8 times a year at 35 locations across the watershed. Annually, water samples are collected from 10 groundwater wells located throughout the watershed. Data loggers record water level on an hourly basis.	The majority of these sites are within the NEB.
Non-government organizations		
Royal Botanical Gardens – Biodiversity and Horticultural Research	Monitoring and research initiatives related to plant conservation, biodiversity, and environmental sustainability.	Surveys and monitoring of plant and animal species within the gardens. Documentation and cataloguing of plant species to contribute to biodiversity databases. Research on plant cultivation, propagation, and

		breeding for ornamental and conservation purposes.
Greenbelt Foundation	Research – Understanding How Greenbelt Agriculture Feeds the Regional Economy and Greenbelt Farmers; A Synthesis of Current Knowledge on the Economics of Soil Health Practices in Ontario (in collaboration with University of Guelph)	Greenbelts are land-use tools that have been used for decades in jurisdictions around the world as a means to protect farmland, natural features, biodiversity.
Bruce Trail Conservancy (BTC)	Monitoring and tracking populations of species at risk; Research and testing biocontrol methods for invasive species; flora and fauna identification along the Bruce Trail through the iNaturalist Bruce Trail Project site.	BTC enables UNESCO Biosphere collaboration and is an active participation in global citizen science through iNaturalist. 91 species of Conservation Concern recorded on BTC managed land.
Niagara Escarpment Foundation (NEF)	NEB research to monitor the effectiveness of the Niagara Escarpment Plan in protecting the Escarpment from inappropriate development and conserving its sensitive ecosystems.	NEF enables learning and teaching about UNESCO Biospheres promoting global collaboration to sustain economies, communities, and ecosystems.
Carolinian Canada - Southern Ontario Seed Strategy	Conserve genetic diversity of plant species with a focus on creating resiliency within nature and agricultural systems.	Collaborative partnership where participants gather monthly to work together to preserve (seed collection and storage) and to share knowledge to ensure the availability of diverse and resilient native plants.
Ontario Power Generation	Species at risk monitoring and recovery plans.	The Niagara River Corridor is an aspiring Ramsar Site on the Canadian side with the US side designated in 2019. OPG property supports multiple species that support this designation including the endangered Allegheny mountain dusky salamander
Niagara Escarpment Corridor Alliance	Visitor survey about the importance of the NE and biodiversity surveys in collaboration with the Bruce Trail volunteers	
Traditional Knowledge Keepers		
Plenty Canada	The Great Niagara Escarpment Indigenous Cultural Map; The Bruce Trail Conservancy and Plenty Canada worked together to integrate Indigenous content into the latest edition of the Bruce Trail Reference Guide. This includes the identification of more than 60 Indigenous plants along the NEB / Laura Secord trail with the examination of how Indigenous peoples used or applied the	Cultural mapping is a process used by organizations, including UNESCO, to describe a variety of research methods, techniques, and tools applied to the identification, description, and portrayal of tangible and intangible cultural resources and assets, including those of distinct populations,

	plants as sources of medicine and nutrition, and for other purposes.	within select landscapes around the world.
Saugeen Ojibway Nation (SON)	SON Fisheries Coastal Waters Monitoring Program	Supports knowledge acquisition in the Great Lakes Basin (bi-national)
Chippewas of Nawash	Saugeen Peninsula Fisheries Assessment Program.	This long-term initiative collects vital biological data from commercially harvested fish in Lake Huron/Georgian Bay. The data informs the management of fish stocks in the Great Lakes Basin. The database contains a historical record of biological data from 1995 to the present.
Bagida'waad Alliance	The Bagida'waad Alliance, led by Chippewas of Nawash Fishing Families, is a not-for-profit who undertake climate research on the waters of Lake Huron and Georgian Bay.	Their activities encourage youth to hear the stories of the Elders about the fish and undertakes active stewardship of the lands and waters.

One notable research project, initiated in 2011, focuses on monitoring forest change across the Niagara Escarpment, with field sampling conducted in collaboration with various partners.

Field sampling to support change analysis was conducted in 2011-12 (p 11 2012 Self-Study). The two objectives of forest sampling and research were :

- 1) Re-inventory of forest stands originally sampled in 1979-81 and see whether changes in forest structure and composition are detectable; and also demonstrate the value and importance of broad-scale and long-term monitoring;
- 2) Pilot Vegetation Sampling Protocol (VSP) and establish a set of VSP plots to strategically link Niagara Escarpment forest monitoring with other VSP landscape scale monitoring and research efforts across southern Ontario.

Field sampling 2011-12 was achieved through partnerships between the Faculty of Forestry at the University of Toronto (now Institute of Forest Conservation, Daniels Faculty, University of Toronto), the Ontario Ministry of Natural Resources and Forestry (MNRF), the Niagara Escarpment Commission, the Niagara Escarpment Biosphere, and with support of local landowners. This effort to resample and analyze the Niagara Escarpment forests was one of the first studies of its kind in southern Ontario, and it was made possible thanks to the historical data collected by Steve Varga as part of an MSc study. The Point-Quarter (P-Q) forest inventory conducted in the 1980s was the only quantitative sampling of the area with information indicating the geographic location of samples, which allowed going back to these sites and resampling the original locations.

The analysis and report utilizing 2011-12 data were produced by Dr. Puric-Mladenovic, University of Toronto's Faculty of Forestry, with support from a post-doc, Yikalo Araya, the MNRF's Natural Heritage Information Centre (NHIC), and two graduate students from the master of forest conservation program.

Since the original forest sampling was done using the Point-Quarter method, the 2011-12 resampling involved re-locating original sites and resampling forests following the same Point-Quarter method. Of the original 111 sampling sites, 88 forest stands were relocated and re-measured on both private and public lands. While an attempt was made to resample all the stands sampled in the historical survey, 20% (23) stands were not possible to sample due to a lack of landowner permissions to access the site or inability to access some of the sites on steep slopes and Escarpment faces.

The analysis was done across the entire Escarpment area and across the five Niagara, Halton, Dufferin, Grey, and Bruce Peninsula sections (Figure 2.4.6 A). These sections reflect political, land use, and environmental differences across the Escarpment first noticed in the Niagara report by Riley et al. 1996. Most stands were sampled in the Niagara and Grey sections, and the least in the Dufferin section due to a lack of landowner permissions to access the site or inability to access some of the sites on steep slopes and Escarpment faces.

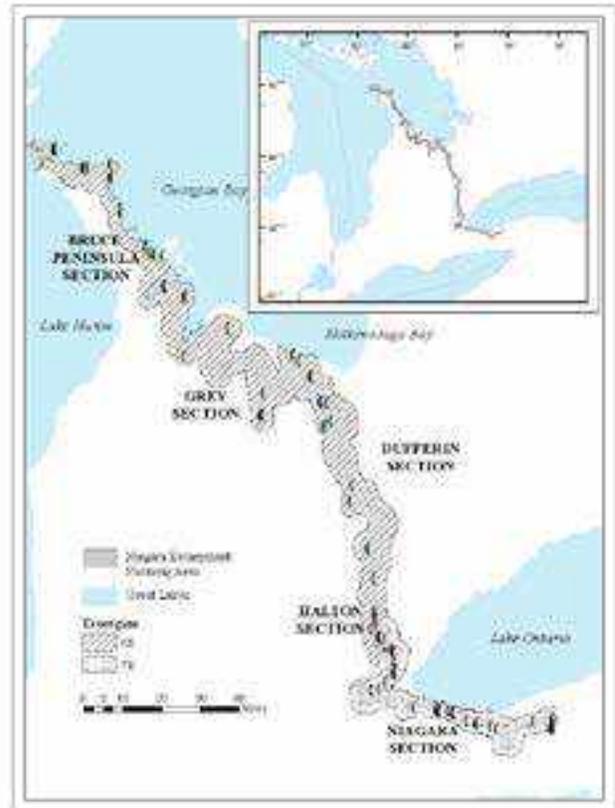


Figure A. The location of the 88 sampled forests stands across the five sections (Niagara, Halton, Dufferin, Grey, Bruce Peninsula sections) of the Escarpment.

The analysis and report below, produced with data from 2011-12, highlight the significance of historical data and collaborations in understanding and preserving the ecological and cultural importance of the Niagara Escarpment.

Long-Term Monitoring and Assessment of Forest Changes in the Niagara Escarpment Ecosystem (for more information, refer to Additional Resources Annex.)

The 2011-12 resampling study, using the Point-Quarter (P-Q) method, successfully relocated and re-measured 88 out of the 111 stands initially sampled in the 1980s. Two objectives for forest resampling and research were: a) Re-inventory

forest stands originally sampled stand in 1979-81 and see whether **changes in forest structure and composition** are detectable and also demonstrate the value and importance of broad scale and long-term monitoring; b) Pilot **Vegetation Sampling Protocol (VSP)** (Puric-Mladenovic, 2011) monitoring; and establish a set of VSP plots to strategically link Niagara Escarpment with other VSP monitoring and research efforts across southern Ontario.

Results and Findings: changes in forest structure and composition between the 1980s and 2011-12

Changes in forest composition and structure between the two time periods were analyzed using P-Q data from 88 resampled stands. The changes were assessed across the five sections (Figure 2.4.6 B) by using several indicators: native and non-native plants, invasive plants and their distribution, floristic quality, and the importance value (as a measure of relative abundance) of trees and saplings.

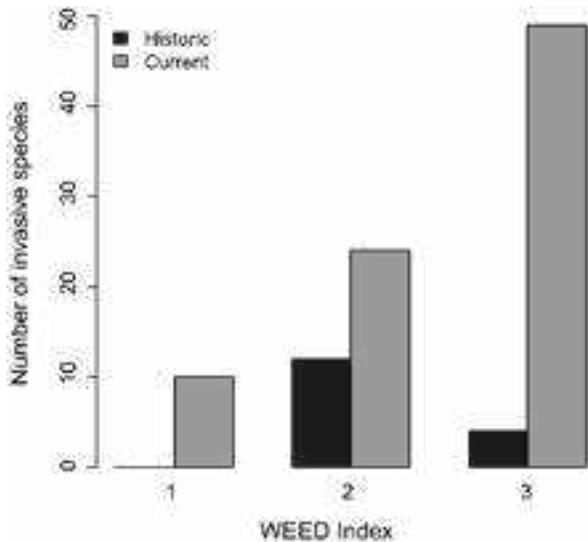


Figure B. Number of stands (y-coordinate) with average weed index ranked from 1 to 3 (x-coordinate) for two time periods. The black bar indicates historical data, and the grey bar presents data.

The most notable findings indicate an increase in exotic and invasive plant species and their abundance, forest stand homogenization across the entire area, the decline in the abundance of some tree species, and changes associated with surrounding land use.

The number of species recorded indicates a 3.5 times increase in exotic species between the two survey periods. About 55% of stands sampled in 2011/12 had a presence of non-native species with a high weed index corresponding to plants that have an occasional impact on natural environments or invasive plants. The ten-fold increase in the number of stands with the highest average weed index

indicates that, if this trend continues, invasive species could pose a major threat to the integrity of the forest ecosystems and alter their structure, composition, and functions. The number of stands with plants that have an occasional impact on natural environments has almost doubled since the 1980s. Where these were once present in 12 stands, they are now present in 25 stands.

The historic survey recorded four invasive plants, Norway maple (*Acer platanoides*), garlic mustard (*Alliaria petiolate*), dame's rocket (*Hesperis matronalis*), and bittersweet nightshade (*Solanum dulcamara*), while the sampling in 2011-12, found 18 species considered to be invasive across different parts of the Escarpment. Of the total 88 resampled stands, 63% had aggressive invaders such as garlic mustard, dame's rocket, common buckthorn (*Rhamnus cathartica*), Tartarian honeysuckle (*Lonicera tatarica*), and white mulberry (*Morus alba*). The distribution of invasive species, particularly garlic mustard and common buckthorn, was found to be influenced by surrounding landscapes, including the proximity of urban development, trails, and human settlements.

The results further highlighted a decline in floristic quality, as measured by the coefficient of conservatism, indicating an increase in plants tolerant to disturbance. In the 1980s, about 11% of plants were from the group that tolerates a variety of conditions and disturbances, while in 2011-12, this increased to 17%. Plants with high degrees of fidelity that are obligated to natural areas account for only 2% of the species identified in both sampling periods. The results show that except for the Niagara Peninsula section of the Escarpment ($p < 0.05$), the four sections (Bruce, Grey, Dufferin, and Halton) did not show a statistically significant change in the floristic quality of native species.

There is also an increased dominance of shade-tolerant species and an indication of forest homogenization. For example, nearly all stands across different sections of the Niagara Escarpment had a more mixed forest composition in the 1980s than in 2011/12. Sugar maple (*Acer saccharum*) and eastern white cedar (*Thuja occidentalis*) are the two most common and abundant canopy species across the stands. These two shade-tolerant species are the only tree species to have increased in average Importance Value across all sampled stands. American beech (*Fagus americana*) has declined in more than 50% of resampled Escarpment stands. It has declined in both its frequency and dominance. In some stands, it has declined considerably from being a co-dominant species to a marginal tree species. Similarly, red oak (*Quercus rubra*) has also declined in its abundance and frequency.

The historical regeneration (seedlings) data shows three main groups of regeneration: a) sugar maple with ironwood (*Ostrya virginiana*) and white ash; b) poplar (*Populus spp*) and white birch (*Betula papyrifera*) with striped maple (*Acer pensylvanicum*); and c) eastern white cedar (*Thuja occidentals*) with yellow birch (*Betula alleghaniensis*) and white spruce (*Picea glauca*). The recent data shows a similar trend in terms of sugar maple regeneration dominance. However, there was an increase in the abundance of white ash regeneration. Poplar seedlings with balsam fir, white spruce, and eastern white cedar are observed to make regeneration in some stands. Striped maple shows increased importance within the forest seedling layer, which often happens in areas subjected to deer browsing pressures.

Results of Vegetation Sampling Protocol (VSP) Pilot Sampling.

The VSP sampling was conducted at the same sites as P-Q sampling with the aim of evaluating the protocol and its merit in monitoring vegetation and its health on the Niagara Escarpment and further developing broadscale monitoring. The VSP pilot sampling enabled the information obtained to be comparable to other ongoing VSP monitoring efforts

in southern Ontario. In total, Dr. Puric-Mladenovic and her team sampled 167 geo-referenced plots across 88 P-Q stands and other areas. A successful assessment using VSP data (based on 56 plots) facilitated the identification of diverse metrics and various indicators of forest quality applied in other VSP research areas: species richness, plant diversity indices, habitat characteristics, basal area, biomass, carbon stock, deadwood, snags, mast trees, mature forest indicators, elements of old growth, complex vertical structures, shade tolerance, vernal pools, species functional traits, and others.

For example, the analysis using VSP regeneration data (seedling and saplings) indicated limited regeneration in the Niagara Escarpment (NE), potentially influenced by factors like deer over-browsing, absence of natural disturbance regimes, and competition from invasive herbaceous species. Some plots displayed large trees with minimal understory vegetation, underscoring the importance of understanding forest succession and regeneration dynamics. Carolinian indicator species, Tulip tree (*Liriodendron tulipifera*), Sassafras (*Sassafras albidum*), Witch hazel (*Hamamelis virginiana*), type and their frequency were pulled out from VSP plots. Garlic mustard was found to be the most abundant invasive herbaceous



Field biologists from Ontario Nature (first established as the Federation of Ontario Naturalists in 1931) conduct a biological survey at Baptist Alvar near the northwestern tip of the Saugeen/Bruce Peninsula.

species and reached the greatest maximum abundance of 75% percent plot cover in more disturbed stands. Based on VSP data, it was possible to determine the average basal area across 56 plots, which is estimated to be 21.65 m²/400 m² (~ 541 m²/ha). It was found that the biomass varied 8-fold from one plot to the other and thus across different forests. Also, the VSP regeneration sub-plots indicated the most frequently browsed species were white ash (*Fraxinus americana*) (37%), alternate-leaf dogwood (*Cornus alternifolia*) (21%), and chokecherry (*Prunus virginiana* var. *virginiana*) (21%), others had 33% browse.

The findings of the 2011-12 sampling underscore the value of broad scale and ongoing monitoring and research for informing adaptive management and conservation of unique ecosystems and the Biosphere landscape. It is recommended that future monitoring should involve a strategic collaboration across multiple agencies in the Biosphere landscape to increase efficiency, prevent duplication, and position Biosphere at the forefront of monitoring and research in southern Ontario.

2.4.7 How have collective capacities for the overall governance of the Biosphere reserve (e.g. organization of new networks of cooperation, partnerships) been strengthened?

The creation of the co-governance structure of the Network strongly enhanced the collective capacity for effective governance of the Biosphere. Since 2022, many meetings have been organized with both Indigenous and non-Indigenous groups leading to this increased capacity. For example, the meeting at Neyaashiinigiimig on November 16, 2023 was an important step in the right direction. The meeting demonstrated respect for Indigenous Peoples in the Niagara Escarpment Biosphere and showcased Indigenous conservation efforts that were multigenerational and applied both western science and Indigenous Ways of Knowing.

In 2023, there were 2 trips to Manitoulin Island where Biosphere representatives met with a number of First Nation Elders, Chiefs, Knowledge Keepers, and Indigenous youth. Relationship building was a mutual priority setting the table for future discussions. A new Network board member is a First Nations Elder from Manitoulin Island, and will continue to guide the relationship building process. As well in 2023, the first Indigenous and non-Indigenous co-chairs were elected to the Network board. See 7.1 for details on the development of the co-chair system.

2.4.8. Please provide some additional information about the interaction between the three zones.

The Escarpment and lands in its vicinity are protected by the Niagara Escarpment Plan (NEP). In 1985, the Ontario government adopted this visionary environmental plan. As Canada's first large-scale environmental land use plan, the NEP presents a connected series of policies and objectives that focus on ecosystem planning principles. The NEP Area covers portions of 22 local municipalities within eight regions and counties and aims to conserve Ontario's Niagara Escarpment as a continuous natural environment. Development within the NEP Area, which aligns with the Niagara Escarpment Biosphere boundaries, must be compatible with this objective. Human activity on the Escarpment is guided and shaped by the NEP's land use policies and objectives. The NEP includes seven types of designated areas each of which has related policies:

- Escarpment Natural Area.
- Escarpment Protection Area.
- Escarpment Rural Area.
- Minor Urban Centre (which exists as a separate data class)
- Urban Area.
- Escarpment Recreation Area.
- Mineral Resource Extraction Area.

The Biosphere zonation model includes three zones - the core area, the buffer zone, and a transition area or area of cooperation. The Protection Area and Rural Area designations are considered "buffer" in the sense that the Natural Area is the most restrictive in terms of permitted uses or allowable land use changes and the remaining designations are reflective of active use for a range of purposes and theoretically could be seen as the zone of cooperation. The creation of the Greenbelt in Ontario in 2005 added a new layer of "Protected Countryside" and as it pertains to the NEP plan area the protected countryside designation includes large amounts of land (1 million acres) and are intended to minimize agricultural land conversion to other uses. Since these lands are largely contiguous to Rural Area NEP designations, the Greenbelt countryside designations might also be considered to serve a "buffer" function or a transition zone to the extent that Greenbelt policies are implemented properly. However, land use policy designations do not capture the fluid interchange of species movement across the landscape, airborne transport of pollutants or ground water flows and the like, and thus can only represent a crude and static

interpretation of the interactions between zones. We know for example that invasive plant species often colonize areas beside trails or along roadside ditches and do not adhere to zonation models.

While the Biosphere may be divided into three zones, the Network uses the guiding principles of Two-Eyed Seeing, which combines the perspectives of both western and Indigenous cultures, and views the landscape more holistically. This multidisciplinary and trans-cultural approach views our world “from one eye with the strengths of the Indigenous ways of knowing, and to see from the other eye with the strengths of Western ways of knowing, and to use both of these eyes together,” balancing western biodiversity mandates together with the wisdom of Indigenous voices and knowledge.

Manitoulin Island is geographically part of the Niagara Escarpment and yet this region is not currently included in the Niagara Escarpment Biosphere. The Network will continue to discuss the inclusion of Manitoulin Island with its communities and hopes to include this region into our Biosphere in the future.

2.4.9 Participation of young people. How were young people involved in the organizations and community decision-making processes? How were their interests and needs considered within the Biosphere reserve? What are the incentives or programs in place to encourage their participation?

Participation of young people in the Niagara Escarpment Biosphere - The Past Decade

Over the past decade, the Biosphere has seen a remarkable surge in environmental youth engagement activities. Recognizing the importance of involving the younger generation in environmental stewardship, numerous initiatives have emerged to educate, empower, and inspire youth to take an active role in preserving this unique natural landscape. The following initiatives serve as a testament to the power of youth engagement in environmental stewardship and conservation and offer hope for a more sustainable and ecologically conscious future (also see Participation of Young People Table 2.4.9).

1) How were young people involved in the organizations and community decision-making processes?

Across the Biosphere, young people (youth) are involved through education, conservation efforts, advocacy, recreation, research, and creative expression. Youth have become integral to the ongoing mission of protecting

and sustaining the Biosphere for future generations. The Biosphere has various educational programs aimed to involve and raise environmental awareness among young people. An example is the experiential education taking place at the DSBN Walker Living Campus at Woodend Conservation Area located at the top of the Niagara Escarpment in Niagara and the DSBN Adventure Campus located adjacent to Shorthills Provincial Park. Learning opportunities include guided hikes, interactive activities, and educational outreach targeted to elementary schools within the Niagara Region. These efforts have helped instill a sense of environmental responsibility and an understanding of the ecological importance of the Biosphere. In return, youth are encouraged to share their feedback and experiences to improve the curriculum based programming the Campus offers, and become part of how community decisions are made within these small pieces of the Biosphere.

Youth engagement in education, conservation, and social justice has played a crucial role in maintaining the biodiversity of the Biosphere. Look no further than the Bruce / Saugeen area where St. Edmunds Public School was designated as a national UNESCO school in 2008. Since this time, the school has promoted the ideals of UNESCO, valuing rights and dignity, gender equality, social progress, freedom, justice, and democracy with three clear priorities: education for sustainable development, global citizenship education, and inter-cultural and heritage learning.

Ecosystem restoration, conservation, and protection is an important mandate of the Biosphere. To support this mandate, activities such as tree planting, wetland restoration, and invasive species removal have involved young volunteers and provided them with hands-on experience in ecological restoration. This leads into citizen science projects which have gained popularity among youth in the Biosphere. An example of this within the Biosphere can be seen through the activities of the Toronto and Region Conservation Authority's Conservation Youth Corps, which offers opportunities for high school students to volunteer for conservation efforts.

To instill a love for the outdoors and a sense of adventure, outdoor programs have flourished in the Biosphere. Youth are encouraged to explore the Biosphere through activities like hiking, rock climbing, scuba diving, kayaking, and canoeing. These experiences not only promote physical fitness but also create a deeper connection to nature.

Look no further than the collaborative engagement opportunity through iNaturalist. iNaturalist is an online social network of people sharing biodiversity information

to help each other learn about nature. It is a crowdsourced species identification system and occurrence recording tool. It is citizen science based, with expert verification to record the public's own observations, get help with identifications, collaborate with others to collect biodiversity information for a common purpose, and to access the observational data collected by iNaturalist users. In partnership with the Biosphere and the Niagara College Office of Sustainability, including many Niagara College students, an iNaturalist Project was created for the Biosphere boundary. This has enabled young people to be directly involved in biodiversity data collection and decision making through the collection of valuable data on local flora and fauna. Contributions from the Biosphere community have seen over 180,000 observations documenting over 6,800 species, not only does this contribute to scientific research, but it also fosters a sense of connection to the environment.

Several youth-led environmental advocacy groups and leadership programs have emerged within the Biosphere. These organizations empower young individuals to become environmental advocates and leaders within their communities. They often collaborate with local government officials to advocate for policies that promote conservation and sustainability. An example is seen at the Royal Botanical Gardens (RBG) in Hamilton. The RBG is located within the Biosphere and is designated as a

Protected Area. Youth involvement opportunities include the YES (Young Environmental Science) Alliance, Junior Naturalist Club, Camp Leadership Development Program, and the Children and Youth Gardening Program. These programs engage youth in environmental stewardship, education, and leadership.

The Biosphere has also seen a rise in art and culture over the past ten years. Youth have more opportunities for expression through various artistic mediums, such as photography, music, and traditional storytelling. These creative expressions help convey the importance of the Biosphere and conservation in a unique and compelling way. A fine example is the Hart House Farm, 150-acres nestled in the Caledon Hills, north of the Cheltenham Badlands. A third of the site falls within the Biosphere. The property is owned by the University of Toronto and is a space for youth engagement, intergenerational connection and community building, knowledge exchange, cultural learning, wellness, healing, ceremony, and, ultimately, as a space that can contribute to reconciliation.

2) How were their interests and needs considered within the Biosphere?

The consideration of youth interests and needs within the Biosphere often involves a combination of educational programs, engagement, and collaboration opportunities.



The Awen' Gathering Place is a space of sharing, learning, teaching and ceremony, to advance recognition of the past and present Indigenous peoples and their heritage legacy in the Collingwood area. Awen' is a Wendat word for "water."

The Biosphere network of partners have developed a long list of youth engagement opportunities often in consultation with their local municipalities, conservation groups, business, academic institutions, industry, and the private sector. Looking at outreach, engagement, and educational programs, many of the educational programs have been specifically tailored for youth. These programs cover topics such as biodiversity, conservation, sustainable development, traditional knowledge, reconciliation, and environmental stewardship. They include field trips, workshops, camps, research, and hands-on learning experiences. Youth are provided opportunities to actively engage with local schools, colleges, and universities to become involved in their activities. This includes partnerships with educational institutions such as Brock University and Niagara College, with their campuses located within the Biosphere boundary. McMaster University and Mohawk College are located adjacent to the Biosphere, with all three campuses of Georgian College located within close proximity to the Biosphere. This close proximity allows the integration of environmental topics into the curriculum and the offerings of experiential learning events to help expose youth to the Biosphere

and spark interest in Biosphere environmental issues. In addition, volunteer opportunities allow young people to actively contribute to conservation efforts within the Biosphere. This includes activities like tree planting, habitat restoration, and wildlife monitoring, providing practical experiences that align with their interests in environmental conservation and academic research.

Many of the groups listed in (TABLE 2.4.9) have youth advisory councils or committees providing a platform for young people to voice their opinions, ideas, and concerns. These councils often contribute to decision-making processes within the Biosphere and provide youth leadership and development opportunities to encourage young people to take on active roles in environmental stewardship. This may also involve training programs, mentorship opportunities, and initiatives that empower youth to lead community-based environmental projects. In addition, youth community engagement projects that involve the broader community, including young people, have been on the rise in the Biosphere over the past ten years. These projects often focus on sustainable development, climate action, eco-action, and other activities that address both environmental and social needs.



Rams head lady's slipper is an endangered orchid species found growing in the lightly shaded earth of coniferous forests along the Escarpment.

There has also been an increase in involving the public, including young people, in citizen science projects. This allows youth to actively participate in scientific research and monitoring activities such as iNaturalist. This hands-on approach enhances their understanding of the local ecosystem while contributing valuable data to conservation efforts.

3) What are the incentives or programs in place to encourage their participation?

The network partners within the Biosphere have numerous types of incentives and programs that are commonly implemented to encourage young people to engage in the activities and initiatives of the Biosphere and in particular environmental conservation efforts. Many of the partners (Niagara College, Brock University, Niagara Community Foundation, McMaster University, and many Biosphere municipalities) offer scholarships and grants to support the education of young individuals interested in environmental studies, biology, ecology, or related fields that can incentivize academic engagement in the Biosphere. An example can be seen in the Township of Mulmur located in the north-east corner of Dufferin County, which straddles the Biosphere. Multiple financial grants and recognitions are available across multiple categories including youth engagement. Recognizing the contributions of young individuals through awards and honors can motivate them to actively participate in environmental initiatives. This can include awards for outstanding volunteerism, leadership, or innovative projects. Many of these same partners provide internships and job opportunities within the Biosphere allowing young people to gain hands-on experience in environmental conservation, research, and management. Many offer training programs, workshops, and skill-building sessions focused on environmental and social topics which can equip young individuals with the knowledge and tools needed to actively contribute to sustainability, conservation, and social justice efforts.

Many academic partners have established youth ambassador programs where young people serve as advocates for environmental causes which empower them to take on leadership roles and promote Biosphere awareness within their communities. An example is the Eco Spark's Greenbelt Youth Ambassadors program which brings together high school and university students living in the Greater Golden Horseshoe area (which includes much of the Biosphere) to create a cohort of Youth Ambassadors who will advocate for the Greenbelt's protection.

Finally, as social media marvels - youth are leveraging social media and online platforms to share information locally, nationally, and globally. The Bruce Trail Conservancy (BTC) is an organization committed to protect and conserve the Biosphere and offers Youth Council volunteering opportunities to engage youth in environmental discussions where they can contribute to conservation efforts along the Bruce Trail. With a robust on-line social media platform, the youth of the BTC are effectively communicating updates and stories related to youth involvement in the Biosphere which is further inspiring the next wave of young individuals to become involved.

See Table 2.4.9. Niagara Escarpment Biosphere – Youth Engagement

Table 2.4.9. Niagara Escarpment Biosphere – Youth Engagement

NEB Section	Youth Programs
Niagara	<ul style="list-style-type: none"> • Walkers Living Campus at Woodend Conservation Area within the NEB (Run by the District School Board of Niagara). Outdoor education for Elementary school aged children. Youth explore the ecological and geological importance of the NEB. • Camp Wetaskiwin (Scouts Canada) within the NEB adjacent to Short Hills Provincial Park in Pelham and St. Catharines. Youth programming along the upper portion of twelve Mile Creek with a focus on the Carolinian life zone of the NE. • Balls Falls Centre for Conservation located along the NEB in Lincoln. Youth programs involve outdoor education along the NEB with a focus on the geology, flora, fauna, and cultural heritage of the area including Indigenous Garden and teachings. • St. Johns Outdoor Education Centre run by the Catholic School Board of Niagara along with Brock University, Niagara Regional Native Centre and the Niagara Peninsula Conservation Authority, outdoor education programming within the NEB (Pelham) focuses on Authentic cultural, spiritual, and environmental lessons. • Niagara College – the only College located within the NEB offering a suite of youth outdoor environmental training and research. • Brock University - the only University located within the NEB offering a suite of youth outdoor environmental training and research. The annual Niagara Childrens Water Festival is now hosted here to take advantage of the Biosphere teaching opportunities. The UNESCO Chair position – sustainability from local to global is situated within Brock University. • Cave Springs Camp, Retreat & Conference Centre located in the NEB in Lincoln aspires to provide opportunities for personal growth in a natural setting, with a focus on school aged youth.
Iroquoia	<ul style="list-style-type: none"> • Hamilton Conservation Authority offers educational programs and camps for elementary and secondary school students. These programs are designed to provide hands-on outdoor environmental education experiences at Dundas Valley Conservation Area, which offers diverse habitats like Carolinian forests, cold-water streams, ravines, meadows, and the Niagara Escarpment. • Royal Botanical Garden (RBG) is a part of Niagara Escarpment Biosphere. YES Alliance, Junior Naturalist Club, Camp Leadership Development Program, Children, and youth Gardening are the programs organized by RBG to engage youth in environmental stewardship, education, and leadership, fostering a connection with nature. • Bruce Trail Conservancy- organization committed to protect and conserve Niagara escarpment Biosphere offers Youth Council for youth providing volunteering opportunities to engage in environmental discussions and contribute to conservation efforts along the Bruce Trail. It also has a citizen science initiative called iNaturalist, where volunteers can collect biodiversity data while hiking along the Bruce trail. • Conservation Halton offers engaging Youth programs in the Niagara Escarpment Biosphere, which includes interactive sessions on Indigenous science, hikes exploring geological features and ecosystems, and hands-on activities on topics such as biodiversity and climate change. (Kelso, Crawford Lake, Hilton Falls, Rattlesnake Point, Mountsberg, Mount Nemo, Robert Edmondson are all the parks and conservation areas under Conservation Halton) • Mother Earth's Learning Village: offers alternative education and holistic experiences for youth in Hamilton and the surrounding area. Their program focuses on connecting with nature and each other, fostering a free-spirited way of learning, expressing creativity, and embracing a holistic lifestyle. The community promotes wellness for individuals, children, and the Earth, emphasizing the importance of living in harmony with nature.
Toronto	<ul style="list-style-type: none"> • TRCA- Conservation Youth Corps- Offers opportunities for high school students to volunteer for conservation efforts. • Glen Haffy Conservation Area located at Caledon under TRCA offers activities such as birdwatching, hiking, cycling, and geocaching. • The Branches Community: offers nature-focused programs for youth, teaching skills such as survival techniques and environment sustainability. They host programs like Maple days and community gardening initiatives, fostering a love for nature and community engagement. • Etobicoke Outdoor Education Centre: The Centre is located on the Oak ridges Moraine and operated by the Toronto District School Board. The program aims to connect students with the natural environment, fostering environmental responsibility. Activities include outdoor lessons, initiatives to encourage learning outside, and a focus on appreciating nature's importance. • Albion Hills Field Centre: offers a range of nature-based activities for youth. They provide curriculum based overnight field trips for schools featuring experiential learning. The Centre conducts adventure camps where children learn about nature, teamwork, and adventure.

Caledon Hills	<ul style="list-style-type: none"> • Credit Valley Conservation (CVC) offers Conservation Youth Corps for teens. During this program, participants engage in environmental stewardship projects across various sites under supervision of CVC staff. The program offers a diverse range of activities and experiences, fostering a deep connection between youth and nature and empowers young minds to make a positive impact on their surroundings • Caledon Hills Bruce Trail Club- The Caledon Hills Bruce Trail Club’s program aims to connect young people with nature. The program enhances students’ connection to nature by providing badges for learning about biodiversity and the environment. • Ontario Nature- offers youth program, empowering teens through nature-based experiences and leadership opportunities. The program includes Youth Council, Youth summit, Youth Circle for Mother Nature, and the pollinator Campaign, fostering a love for nature and commitment for conservation of nature.
	<ul style="list-style-type: none"> • Hart House Farm - includes 150-acres nestled in the Caledon Hills, north of the Cheltenham Badlands. A third of the site falls within the Niagara Escarpment Biosphere. The property is owned by the University of Toronto and is run as a space for youth engagement, intergenerational connection and community building, knowledge exchange, cultural learning, wellness, healing, ceremony and ultimately, as a space that might contribute to reconciliation.
Dufferin Hi-Land (3)	<ul style="list-style-type: none"> • Dufferin Bruce Trail Club- organizes activities like the Children’s Treasure Hike and Beautiful Tree Trail to engage youth in nature conservation. They offer interactive experiences, badge programs, guided hikes, and volunteer opportunities, fostering environmental awareness and encouraging active participation in conservation efforts. • Boyne Valley: offers nature them activities for family and kids, which includes exploring Beewise Nature Trail, Enfield Fairy trail, Loughcrew Estate and Gardens, Newgrange Farm, and Red Mountain Open Farm. These programs offer immersive experiences in natural environments. • Free Spirit Forest and Nature School This campus is located at Creemore.
Blue Mountain	<ul style="list-style-type: none"> • Blue Mountain WILD School: Located in the Beaver Vally Lowlands area of the NEB, Blue Mountain WILD School Our mission is to reconnect our future leaders with the natural world and with themselves. We strive to create a new model of education that focuses on the whole student. We seek to create experiences and learning opportunities to ignite curiosity and passion for learning while developing confidence, resilience, and courage in order to empower the changemakers. These are the leaders that will lead their peers and their community to make the world a better place. • Scenic Caves Nature Adventures: offers outdoor activities and educational programs at the Niagara Escarpment such as self-guided tours of caves, crevasses, and scenic lookouts. Tailored for ages 3 and up, the activities cover nature, geology, and ecosystems. • NVCA- offers educational initiatives for schools and organizations. Through the school yard program, students can participate in interactive sessions such as Nature Discovery and Splash. Water in the Environment, Birds of a Feather, Rocks and Minerals, Endangered Species, and Predator-Prey activities. • The Blue Mountain: offers an extensive Youth program aimed at encouraging outdoor exploration among young residents. With over 285km of public trails, including a section of the Bruce trail and a UNESCO Biosphere, the program provides unique hiking experiences along the Niagara Escarpment. • Free Spirit Forest and Nature School (Collingwood) offers diverse nature-based programs for youth and adults. Their core weekly programs cater to different age groups, teaching resilience and connection to nature. They also provide additional programs like March Break Camps, and specialized Summer Camps focusing on nature-based adventures and outdoor skills. There are adult workshops, volunteer opportunities, and co-op placements available too. • Georgian College: With all three campuses - Orangeville, Blue Mountain, and Owen Sound located near the Niagara Escarpment Biosphere, Georgian College encourages environmental and earth sciences students to visit through field work and exploration the Niagara Escarpment. • Creemore Nature Preserve (Nature Conservancy Canada): The Nature Conservancy of Canada offers various youth opportunities in conservation. Through the Leaders in Conservation Program, young individuals can contribute financially to protect nature in Ontario and experience the conserved landscapes. The Conservation Volunteers initiative allows youth to engage in hands-on conservation activities alongside NCC staff, exploring unique habitats and observing rare species. NCC encourages youth participation in research projects on their properties, ensuring biodiversity protection. Volunteer steward positions enable young individuals to actively contribute to conservation efforts on specific NCC properties. Additionally, the organization provides conservation internships, offering practical experience and skill development for aspiring conservation leaders. These programs empower youth to actively participate in preserving nature and gain valuable conservation experience.
Beaver Valley	<ul style="list-style-type: none"> • Elephant Thoughts: The woods at Beaver Valley near Kimbercote provide youth with nature retreat experiences in over 100 acres of forest, streams, and trails near Kimberley. Offers include School in Nature, March Break, and Summer Camps, focusing on environmental science, Traditional workshops from local Indigenous Elders. Activities include forest foraging, orienteering, canoeing, hiking, ornithology, and interactions with diverse cultures. These programs aim to help youth recharge, develop resilience, and interact while immersed in nature.

	<ul style="list-style-type: none"> • Blue Mountain WILD School: provides outdoor education programs for Kindergarten to Grade 8 students, led by certified teachers. Their offerings include full-time, Friday-only, after-school, and weekend programs focusing on outdoor skills like bushcraft and paddleboarding. They also offer a summer day camp for ages 4 to 12 and specialized teen programs, including Junior Leader in Training and Leader in Training programs, promoting wilderness skills and teaching abilities. These experiences aim to enhance academic learning, personal growth, and environmental awareness in a natural setting.
Sydenham	<ul style="list-style-type: none"> • At Last Forest Schools: offers nature-based programs including Forest Schools, Summer Camps, and March Break Camp. The program emphasizes individual needs, curiosity, and connecting with nature, fostering a love for the outdoors. • Free Spirit Forest and Nature School This one campus is located at Meaford. • Pottawatomi Conservation Area UNDER Grey Sauble Conservation Authority (GSC): The Pottawatomi Conservation Area is 116 hectares of Niagara Escarpment land and provides youth activities promoting nature education and conservation awareness through camps, Forest Festivals, and Young Naturalists, fostering a love for nature and outdoor exploration.
Bruce Peninsula	<ul style="list-style-type: none"> • Bluewater Outdoor Education Centre provides curriculum-driven outdoor and environmental education to Bluewater District School Board. They offer hands-on learning in nature. Approximately 2000 students participate annually in day excursions, residential programs, and camping activities within the UNESCO Biosphere. • St. Edmonds Public School - On June 2, 2008, St. Edmonds Public School was designated as a national
	<p>UNESCO school, with the designation comes a real responsibility to live and learn within the 4 study themes of UNESCO. UNESCO Associated Schools Network (ASPnet) connects more than 12,000 schools in 182 countries with a common goal to build peace in the minds of children and young people. Through concrete actions member schools promote the ideals of UNESCO valuing rights and dignity, gender equality, social progress, freedom, justice and democracy, respect for diversity and international solidarity. The Network operates at international and national levels with three clear priorities: education for sustainable development, global citizenship education and inter-cultural and heritage learning.</p> <ul style="list-style-type: none"> • The Bagida'waad Alliance, led by Chippewas of Nawash Fishing Families, the Alliance is a registered as a not-for-profit corporation (2018). The Alliance has been collecting the stories of the changes in the environment through hiring youth to interview community members, produce a mini-documentary, and compiling a book of stories. The Alliance is also running a Film School for Anishinaabe youth in the region to gather stories about the perspectives of stewardship. • Escarpment Biosphere Conservancy (Hobson, Alvar): The Escarpment Biosphere Conservancy (EBC) has over 230 nature preserves across various regions, offering educational programs for youth. Their initiatives focus on conserving endangered species, combating climate change, and maintaining biodiversity. EBC hosts events like the EBC Butterfly Festival, emphasizing monarch butterfly conservation. They engage the community through the Wild Futures Project to secure natural properties to ensure a sustainable future. • Ontario Parks: The park Ambassador program at Ontario Parks offers youth the opportunity to learn essential outdoor skills and enjoy Ontario's parks. Through virtual workshops, campsite sessions, and drop-in workshops, Park Ambassadors teach skills like campfire building, campsite setup, and wildlife identification. The program aims to enhance the outdoor experience for both first-time visitors and regular park-goers. Participants can engage in interactive sessions at various participating parks, fostering a love for nature and outdoor activities.

Innovation Youth Engagement Partnerships in the Biosphere

Niagara Peninsula Conservation Authority

Education plays a vital role in conserving the Niagara Escarpment Biosphere for future generations. The Biosphere hosts a number of field centres for outdoor education and environmental studies by school boards and conservation authorities. These centres provide school aged youth and the public an opportunity to learn firsthand about the Biosphere's natural and cultural environment by directly engaging the community in Escarpment-based outdoor learning activities. The Niagara section of the Biosphere hosts three educational field centre examples: the DSNB Walker Living Campus at Woodend Conservation Area, the DSNB Adventure Campus in the Short Hills area and the St. Johns Valley Centre Conservation Area. Two of these centres are the result of partnerships between the Niagara Peninsula Conservation Authority and local district school boards.

DSBN Walker Living Campus

The DSNB Walker Living Campus at Woodend Conservation Area is located on the top of the Niagara Escarpment near the boundary of Niagara-on-the-Lake (NOTL) and St. Catharines and is adjacent to the NOTL campus of Niagara College. The DSNB Living Campus was made possible through a partnership between the Niagara Peninsula Conservation Authority (NPCA) and the District School Board of Niagara (DSBN). The NPCA and DSNB embarked on this exciting new project to transform the outdated and rundown outdoor centre into a one of a kind Living Campus. Completed in the fall of 2014, students of the DSNB are now able to experience innovative nature-based activities that foster exploration, discovery, imagination, and independent play in the great outdoors. With sweeping vistas of Lake Ontario and the Escarpment slopes, Woodend is considered to have been an observation point during the War of 1812. Woodend's location was at the center, with the battle of Queenston Heights 9.6 kilometers to the east, the battle of Beaver Dams 4.8 kilometers to the southwest, and the battle of Lundy's Lane battle 9.6 kilometers southeast.

In addition to the rich cultural history of the site, environmental studies are at the core of the centre's programming. All outdoor guides have bachelor's/master's degrees in science, environmental studies, or outdoor recreation. The staff run a full day program for students from K-12 and focus on inquiry and exploration-based learning, encouraging all students to explore and discover nature. Highlights include team and leadership building,

low ropes course, orienteering, outdoor survival skills, wetland studies, wild zone, snowshoeing, and cross-country skiing.

St. Johns Valley Centre

The St. Johns Valley Centre is an education partnership formalized in December of 2021 between the Niagara Peninsula Conservation Authority, the Niagara Catholic District School Board, Brock University, and the Niagara Regional Native Centre. The Centre is located at the St. Kateri Tekakwitha Centre, in the former village of St. Johns in Thorold. Situated in the upper Twelve Mile Creek watershed (the only cold-water fishery in Niagara) and the Short Hills section of the Biosphere, the St. Johns Valley Centre is an ideal learning environment. The staff run a full day program for students from K-12 and focus on developing innovative and interactive experiential approaches to outdoor education and learning. In addition to authentic cultural, spiritual, and environmental lessons students participate in nature inspired learning, rich outdoor programming, and mind and movement activities.



A visitor studies ferns and cedars in the canyon of spillway trail at Mono Cliffs Provincial Park.

3. ECOSYSTEM SERVICES

3. ECOSYSTEM SERVICES:

3.1 If possible, provide an update in the ecosystem services provided by each ecosystem of the Biosphere reserve and the beneficiaries of these services. (As per previous report and with reference to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework.)

Ecosystem services were not discussed or identified in the 2012 periodic review submission. However, Network Board Member and Professor of Biology at Brock University acquired a Master student (Familusi Adekunle, 2023) to develop a first valuation of the ecosystem services within the Network, mainly focusing on the core area and part of the buffer zone. See map below of areas assessed in the NEB for ecosystem services.



Figure 3.1A: Area of the NEB assessed for Ecosystem Services.

The valuation classification followed the Food and Agricultural Organization’s Land Cover Classification System which are nominal values representing Barren, Water Bodies, Evergreen Needleleaf Forests, Deciduous Broadleaf Forests, Mixed, Broadleaf/Needleleaf Forests, Open Forests, Sparse Forests, Dense Herbaceous, Sparse Herbaceous, Dense Shrublands. The classification system evaluates the characteristics and functions of different types of land cover and assigns numerical values to represent their contribution to ecosystem services. For example, a piece of land covered mostly by dense forests will have a numerical value based on the characteristics of dense forests, such as their ability to provide habitat for wildlife, regulate water flow, and store carbon dioxide.

This helps researchers and policymakers understand and quantify the value of various ecosystems in terms of the services they provide to humans and the environment.

Name	Value	Description
Barren	1	At least of area 60% is non-vegetated barren (sand, rock, soil) or permanent snow/ice with less than 10% vegetation.
Water Bodies	3	At least 60% of area is covered by permanent water bodies.
Evergreen Needleleaf Forests	11	Dominated by evergreen conifer trees (>2m). Tree cover >60%
Deciduous Broadleaf Forests	14	Dominated by deciduous broadleaf trees (>2m). Tree cover >60%.
Mixed, Broadleaf/Needleleaf Forests	15	Co-dominated (40-60%) by broadleaf deciduous and evergreen needleleaf tree (>2m) types. Tree cover >60%.
Open Forest	21	Tree cover 30-60% (canopy >2m)
Sparse Forests	22	Tree cover 10-30% (canopy >2m)
Dense Herbaceous	31	Dominated by herbaceous annuals
Sparse Herbaceous Forests	32	Dominated by herbaceous annuals
Dense Shrublands	41	Dominated by woody perennials (1-2m) >60% cover

Table 3.1A: Food and Agricultural Organization’s Land Cover Valuation Classification by land type

The analysis was done using ArcGIS software to make it easier to extract detailed map data. To understand how the land use and land cover types changed over time, a tool called the ‘categorical change’ function was utilized to help spot areas where there have been changes in land cover from year to year. This was done for each year between 2001 and 2020 to see how land cover has changed over the two decades. After the changes were identified, the changes categorized and grouped by areas with similar types of land cover.

To gather information about vegetation, a vegetation dataset called the Normalized Difference Vegetation Index was used to help understand how much vegetation was present in an area by looking at how it reflects certain wavelengths of light. The data used had a spatial resolution of 1km, which means each pixel on the map represents an area of land 1 kilometer by 1 kilometer. This helped determine how changes happened over time.

The area looked at in the analysis covered 197,000 hectares, stretching from the southern tip at Niagara to the northern point in Tobermory. The biggest changes in terms of what the land was covered by happened in 29% of the years. For example, areas that were once sparsely covered by forests with about 30% of the land having trees saw changes to become densely covered by herbaceous plants that grow annually. This happened in about 28% of cases where there were changes. What is interesting is that between 2008 and 2009, there were more significant changes compared to the overall changes from 2001 to 2020. This suggests there was a rapid change in the type of land use and land cover in 2009, but things started to recover afterward. A possible particle explanation could be the emerald ash borer, a

destructive insect, was first found in Southern Ontario in 2002. It spread rapidly throughout the region, causing widespread damage to ash trees. By 2009, the infestation had become well-established in many parts of Southern Ontario, significantly impacting ash tree populations and prompting efforts to manage and mitigate its effects.

Statistical tests were run, and it was found there were significant differences in these transformations over the decade. Specifically, the most noticeable changes over the 20-year period were when areas that were sparsely forested transformed into densely covered areas by herbaceous plants, and when sparse forests changed into open forests.

For valuation, cited works relative to the Southern Ontario region conducted by Troy & Wilson (2006) and David Suzuki (2023) were relied upon. An estimated \$1.8 billion worth of regulating ecosystem services were derived from the NEBR annually, but with the outlier event in 2009, which resulted in a \$125 million loss in value addition.

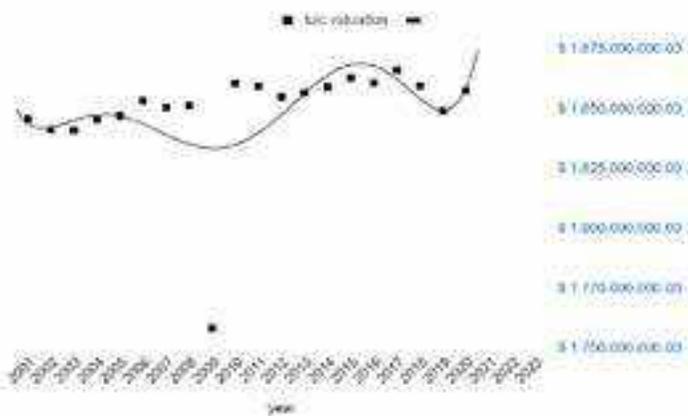


Figure 3.1B: Annual valuation of the regulating services (material and non-material) provided by the NEB (values \$/yr).

The analysis showed that in general while the valuation does not show major variation in net worth (except 2009), the type of land cover has however changed. The forests have been reduced considering the conversion from sparse forests to dense herbaceous annuals, which indicates significant deforestation in the NEB. The significant transformation of sparse forests to open forests may also account for the deforestation losses. The valuation of all this land comes out to about \$1.8 billion, which means roughly \$9,375 for every hectare of land in the NEB.

Several other studies have looked into the Niagara Escarpment over time. For example, one study in 2009 by the Ontario Ministry of Natural Resources found that forests were valued at \$25,843 per hectare per year,

while wetlands were valued at \$15,171 per hectare per year. Another study for the Greenbelt, which includes the Niagara Escarpment, found wetlands to be valued at \$14,153 per hectare per year, but forests were valued lower, at \$5,414 per hectare per year. The decline in the valuation of forests is of concern as forests provide essential services like carbon storage, clean air and water, soil preservation, nutrient cycling, and habitat for wildlife.

A recent report from the Office of the Auditor General of Ontario in 2022 estimated the ecosystem services of the Niagara Escarpment, including clean water, pollination, and carbon storage, at about \$1.3 billion. Similarly, the Nature Conservancy of Canada and the TD Bank Group valued the forests of the Bruce Peninsula at \$19,400 per hectare. All these valuations highlight how important it is to conserve the Niagara Escarpment for the many ecosystem services it provides.

One reason for its importance is its high level of biodiversity, with at least 70 species at risk living within the Biosphere. The Auditor’s report also shows that the Escarpment is a significant source of agricultural land, contributing about \$1.4 billion per year to the economy in the Niagara Peninsula alone.

Other local initiatives, like the Grey Sauble Conservation Authority, have also reported valuations of ecosystem services. They found that forested ecosystems make up 80% of their territory and are valued at \$45.6 million, while wetlands make up 12% of the land and are valued at \$22.8 million. Considering carbon sequestration from their forests, they estimate a value of \$813 per hectare per year, totaling about \$148,000 per year (at \$21/tonne) for their 9,400 hectares of forest, based on Ontario’s Cap and Trade Program.

The Network recognizes there is more work to be done to further develop the importance of linking human societies to ecosystem services. This acknowledgement of the interconnected dynamics of nature is an important understanding endorsed by the Network. They are committed to support diverse networks of partners in



The Bruce Trail meanders through an alvar (Scandinavian for flat) ecosystem on the Bruce Peninsula, where paintbrush and rare lakeside daisies proliferate.

their work to steward and protect nature within the Biosphere through traditional Indigenous Knowledge Systems and other perspectives. The Network wishes to continue to make important strides in ensuring the Biosphere and the relevant assessments used to steward it are consistently underpinned in two-eyed seeing. Although ecosystem service assessments provide some acknowledgment of the non-market cultural and community well-being value of ecosystems to our human lives, it is not enough and does not go far enough to fully honour or encapsulate the traditional knowledge of our lands. To assess nature's gifts and limits meaningfully from a Two-Eyed perspective, where both ecosystems and people are a part of and serve the web of life, nature's contributions must be viewed holistically with all constituents of the web of life at its center.

3.2 Specify if there are any changes regarding the indicators of ecosystem services that are being used to evaluate the three functions (conservation, development and logistic) of the biosphere reserve. If yes, which ones and give details and update.

As the ecosystem services for the NEB were never assessed in the past, the previous Master student study of (Vasseur & Familusi, 2023) becomes one of the baselines (and the most recent) to start further developing how to assess

ecosystem services according to the three functions. For example, through this analysis, the percentage of forested lands showed a decline mainly for the benefit of agricultural and urban development. The monitoring of these values over time can help the Network to bring concerns regarding the conservation function to the conservation groups providing this support.

Through the research network of the Network, it will be possible in the future to further assess and monitor the most important ecosystem services essential for the NEB. Ecosystem services are all contributions from the natural world that benefit all living things including humans. Ecosystems provide goods and services such as food, clean water, climate regulation and recreational, cultural, or spiritual functions. These benefits are essential for human survival.

The Network aims to gradually conduct assessment of the ecosystems using the Nature's Contributions to People approach, as it is more inclusive considering the nature of the NEB and its co-governance structure. Vasseur & Siron, 2019 prepared a guide on how to assess ecosystem services using the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services concept of Nature's Contributions to People as an alternative to the concept of ecosystem services. NCP is defined as the contributions

or losses that people obtain from nature and allows for the assessment of the quantitative and qualitative values of the contributions of nature to humans.

However, before a Nature's Contributions to People assessment can be done, there is a need to address and understand how Indigenous indicators and knowledge can be woven into assessments to demonstrate a comprehensive understanding of the community values of nature's gifts in the Biosphere. The Network recognizes that without reconciling the Indigenous "eyes" and our contemporary Western "eyes" into these assessments, our strategic planning will never be inclusive and representative of all peoples in the Biosphere. As part of the Biosphere's path to reconciliation, there is a need to return to natural law by supporting and participating in two-eyed research that restores us to the treaties and wampum belts that have stewarded and honoured our land for time immemorial.

3.3 Update description on biodiversity involved in the provision of ecosystem services in the biosphere reserve (e.g. species or groups of species involved).

Biodiversity is an important component of the NEB. However, its assessment regarding the provision of ecosystem services has yet to be done. The recent assessment showed that the importance of biodiversity, especially in the core zone. As also reported by the Nature Conservancy of Canada and the TD Bank Group the forest of the Bruce Peninsula, for example, can be valued at \$19,400/ha. These valuations all demonstrate the importance of the conservation function of the Niagara Escarpment for the provision of several ecosystem services. The major reason relates to its high level of biodiversity with at least 70 species at risk living on the Escarpment.

3.4 Specify whether any recent/updated ecosystem services assessment has been done for the biosphere reserve since its nomination/last report. If yes, please specify and indicate if and how this is being used in the management plan.

The assessment by Vasseur & Familusi, 2023, which is presented in Section 3.1, is the most recent updated ecosystem services assessment that has been done for the biosphere in the past 15 years. Tim Lanthier from the Grey

Sauble Conservation Authority (2018) reported a "cursory valuation" of the ecosystem services provided by their properties. Their land portfolio encompasses over 11,000 ha and, using the "Ontario's Wealth, Canada's Future: Appreciating the Value of the Greenbelt's Eco-Services" (Wilson, 2008), support 80% of forested lands and 12% of wetlands, which provided 99.5% of the ecosystem services. It was recommended that it is updated every five years, and the data should be integrated into the management plan.

With the increasing importance of adding the cultural Indigenous values to the assessment of ecosystem services it is essential that a deeper understanding of how both Indigenous and non-Indigenous communities across the Biosphere value and depend on nature's contributions be developed. This would reduce the emphasis placed on monetary value and incorporate multiple knowledge systems to uncover sound knowledge surrounding the physical and spiritual values of the services provided by our ecosystems. By taking the time to understand and pay attention to nature, both its limitations and gifts, we can profoundly take part in the ongoing acts of reciprocity within nature and be involved participants in making ethical and effective decisions surrounding biodiversity conservation and sustainable development. The assessment of the targeted NCP will provide the ability to create future meaningful and effective collaborative management and monitoring practices that are created in Ethical Space and with a cooperative spirit with Network partners. The Network aspires to follow the Indigenous voices in our Biosphere to guide our network to extend our protocols for gratitude, outside of just human to human connections, and develop protocols of gratitude to the living earth as well. This work and the work referenced above will inform the Network's future strategic and management plans.

4. THE CONSERVATION FUNCTION

4. THE CONSERVATION FUNCTION:

[This refers to programmes that seek to protect biodiversity at landscape and site levels and/or ecological functions that provide ecosystem goods and services in the Biosphere reserve. While actions to address this function might be focused on core area(s) and buffer zone(s), ecosystem dynamics occur across a range of spatial and temporal scales throughout the Biosphere reserve and beyond.]

4.1 Significant changes (if any) in the main habitat types, ecosystems, species or varieties of traditional or economic importance identified for the Biosphere reserve, including natural processes or events, main human impacts, and/or relevant management practices (since the last report).

Several sections in this self-study report on the economic importance of agriculture, tourism, and aggregates to the NEB and comment on the impact of the global COVID-19 pandemic on these and other sectors. See Section 7.7.1 for a description of updates to the NEP 2017.

Since the last report, a significant ecological challenge facing the Biosphere has been the impact on forest conditions due to alien species and tree disease. The Biosphere's forests face an ongoing challenge as they grapple with the impact of various insects and diseases. The region's rich biodiversity and extensive forested areas make it susceptible to outbreaks that can affect both hardwood and softwood species. Among the prominent threats are the emerald ash borer, beech bark disease, and spongy moths.

The emerald ash borer is an invasive beetle that has decimated ash tree populations across the province. The infestation has led to widespread tree mortality, impacting the aesthetic value of forests, ecosystem health and access to traditional wood products used by Indigenous Peoples. First found in Windsor in 2002, this invasive species attacks and kills several species of Ash tree (*Fraxinus spp*). While the adults feed on the leaves and cause wilting, yellowing, and crown dieback, the eggs are laid under the bark, and cause internal damage that results in mortality. Larval damage from feeding on the cambium creates tunnels that block the trees' ability to take up water and nutrients from their roots. Once the ash borer is established, eventually the whole tree dies due to trunk and branch mortality.

According to estimates made by Natural Resources Canada), the Emerald ash borer has damaged or destroyed 601,672 hectares of ash trees in Ontario.

The spongy moth (formerly known as LDD or gypsy moth) has had recurrent damaging outbreaks that are cyclical, typically occurring every seven to 10 years. In Ontario, major outbreaks have peaked in 1985, 1991, 2002, and 2008. The most recent outbreak, which peaked in 2021, was the most widespread recorded in the province. Spongy moths have had a significant impact on a range of hosts including oak, birch, aspen, and eastern white pine.

The impact of beech bark disease on the Biosphere's forests has raised concerns about the health of beech trees, their contribution to biodiversity and wildlife habitat (e.g., beech nuts). Beech bark disease is the result of an insect-fungal pathogen complex initiated by the infestation of beech scale (*Cryptococcus fagisuga*) on American beech. The disease causes reduced growth, deformed trees, decreased wood quality and mast production, and usually causes early tree death.

In addition to invasive insect pests and tree diseases, there has been an increase Invasive plants include non-native trees, shrubs, and plants that are spread by global trade, human and animal transport, and horticulture. Many invasive plants are not suitable as a food source for wildlife and can greatly reduce biodiversity in forests and urban green spaces by displacing native species. Some of the species on environmental watch lists that occur in the Biosphere include: Giant Hogweed (*Heracleum mantegazzianum*), Common Buckthorn (*Rhamnus cathartica*), Garlic Mustard (*Alliaria petiolata*), Dog-strangling Vine (*Cynanchum rossicum*) and Wild Parsnip (*Pastinaca sativa*).

New species of concern are being detected almost annually. For example, in June 2023, the first confirmed detection of oak wilt was found in Canada with one of the three locations being within the Biosphere in the Town of Niagara-on-the-Lake. To help monitor new invasions, the Ontario Invasive Species Centre has implemented an Early Detection and Rapid Response (EDRR) Network. This is a citizen/community science project that trains and equips citizens with the skills and resources needed to detect and prevent invasive species from establishing in Ontario and the Biosphere.

Forest managers, scientists and community scientists are working diligently to monitor, understand, and mitigate the impacts of these threats to preserve the integrity of



Two-thirds the height of Niagara Falls, Balls Falls cascades over the Niagara Escarpment, accessed by nature trails with spectacular views.

Ontario's diverse forest ecosystems. See section 2.4.6 for a detailed description of how alien species and diseases are impacting the health of the forests in the region as studied in a significant forest plot resampling study.

4.2 Describe the main conservation programmes that have been conducted in the biosphere reserve over the past ten years as well as current on-going ones. Note their main goals and the scope of activities, e.g. biotic inventories, species-at-risk, landscape analyses, conservation stewardship actions. Cross reference to other sections below where appropriate.

Conserving biodiversity, including species at risk, is essential for ecosystems to stay healthy. Natural environments within the Niagara Escarpment Biosphere contribute to an estimated 1.3 billion dollars in ecosystem services (clean water, pollination, carbon storage, etc.) each year to Ontarians (Auditor General, 2022). The conservation of the Niagara Escarpment is a shared responsibility where people live and work in a region recognized for efforts to promote solutions for the conservation of biodiversity and the sustainable use of resources.

The main conservation programmes in the NEB are conducted through the many partners, stakeholder,

and community volunteers. Many of the conservation programs in the NEB are led by local conservation and research organizations, all levels of government (municipal, regional, provincial, federal), First Nations, public, and private organizations. All conduct a wide range of conservation programs with a wide range of partners, throughout all zones of the NEB.

The following section highlights the main partners undertaking conservation programs in the NEB over the past ten years. These programs are summarized in Table 4.2. below.

Conservation Authorities (CA)

Conservation Authorities in Ontario are organizations responsible for managing and protecting natural resources within specific geographic regions (watersheds). Conservation Authorities emerged in response to environmental concerns and the need for integrated watershed management. The Conservation Authorities Act was enacted in 1946 to provide a legal framework for the creation and operation of Conservation Authorities in Ontario. This legislation grants Authorities specific powers and responsibilities related to the conservation, restoration, development, and management of natural resources.

There are seven Conservation Authorities operating within the NEB. A key role is their collaboration with the NEB network partners and stakeholders, including municipalities, government agencies, non-profit organizations, and the public. This collaborative approach is essential for effective watershed management and environmental conservation.

Conservation Authorities in Ontario carry out the following conservation programs that serve both provincial and municipal interests. These programs include:

- **Natural Hazard Management:** Addressing issues related to natural hazards such as floods and erosion control.
- **Management of Conservation Authority Owned Land:** Ensuring responsible stewardship of lands owned by conservation authorities.
- **Drinking Water Source Protection:** Implementing measures to protect drinking water sources under the Clean Water Act.
- **Surface Water and Groundwater Monitoring Programs:** Monitoring and managing water resources to maintain their quality and availability

Conservation Ontario

Conservation Ontario, representing 36 local Conservation Authorities (CAs) in Ontario, is dedicated to the preservation and responsible management of the province's water, land, and natural habitats.

2 Billion Trees Program

In 2021, Conservation Ontario secured a \$9 million grant from Environment and Climate Change Canada. This funding supported 18 CAs in implementing 64 projects aimed at reducing greenhouse gas emissions through wetland, grassland, and riparian protection, as well as sustainable agricultural land management practices. In 2022, CAs planted 2 million trees and collaborated with partners, including Forests Ontario, to contribute to the 2 Billion Trees Program.

Near-Urban Nature and Achieving Canada's Protected Areas Target Program

With generous support from the Greenbelt Foundation, Conservation Ontario is part of a collaboration to help achieve Canada's Target 1 goal of protecting 25 per cent of lands and waters by 2025 and 30 per cent by 2030. Ontario Nature has partnered with five municipalities and four



The structurally weaker, thinner bedded rocks, and lower lake levels have combined to encourage the collapse of the lower strata and the development of caves at Cliff Point on the shore of Bruce Peninsula National Park.



The Nature Interpretive Centre of the Royal Botanical Gardens Arboretum allows youth an opportunity to experience a closer connection to escarpment relations.

CAs, finding that numerous owned or managed lands meet national protected areas standards, ranging from urban parks to unique ecosystems on the Niagara Escarpment Biosphere and the Oak Ridges Moraine.

Hamilton Conservation Authority (HCA)

The Hamilton Conservation Authority is actively involved in several conservation programs and initiatives within the NEB.

Hamilton Watershed Stewardship Program

The Hamilton Watershed Stewardship Program collaborates with landowners within HCA's watershed to promote responsible land management practices. Through this program, HCA works to enhance water quality, protect natural habitats, and engage the community in stewardship efforts.

Near-Urban Nature and Achieving Canada's Protected Areas Target Program

In spring 2023, Hamilton Conservation Authority designated three Conservation Area properties as Protected Areas (PAs) after a comprehensive evaluation process. Although many conservation areas protect biodiversity,

they do not automatically meet national criteria for Protected Areas. The increased 2025 target of protecting 25% of Canada's lands prompted a reassessment, involving various entities, including Ontario Conservation Authorities, Ontario Nature, and Environment and Climate Change Canada. The collaboration aims to ensure properties managed as Protected Areas contribute to national targets. Hamilton Conservation Authority swiftly supported this initiative, designating Dundas Valley Conservation Area (a nodal NEB park), Beverly Swamp Natural Area, and Fletcher Creek Ecological Preserve as Protected Areas, collectively covering 2,239 hectares, contributing to Canada's 2030 goal of protecting 30% of lands and waters.

Niagara Peninsula Conservation Authority (NPCA)

Watershed Programs and Services:

- Flood and Hazard Management: Implementing strategies to mitigate flood risks.
- Source Water Protection: Safeguarding water sources.
- Species Protection: Supporting biodiversity and protecting endangered species.

- Ecosystem Restoration: Enhancing natural habitats.
- Community Stewardship: Engaging the community in conservation efforts.
- Land Management: Responsible stewardship of lands within the watershed

Near-Urban Nature and Achieving Canada's Protected Areas Target Program

In the fall of 2023, the NPCA contributes an additional 790 hectares towards Canada's Protected Areas target through the addition of 11 properties. Six of these properties, including Beamer Memorial, Cave Springs, Lathrop, Louth, Mountainview, and Woolverton, located within the Core Area of the Niagara Escarpment Biosphere, were designated as Protected Areas, meeting strict national standards for biodiversity protection. These properties, vital for conserving the ecoregion and species at risk, contribute to safeguarding the Niagara Escarpment's biodiversity and natural heritage. The NPCA's strong policies and management strategies aim to preserve the area's ecological health and resilience in the face of environmental threats.

Halton Conservation

Conservation Halton is actively engaged in several conservation programs within the Niagara Escarpment area.

Conservation Area Land Acquisition Program

Halton Conservation owns and manages 8 Conservation Areas within the Niagara Escarpment Biosphere. These areas are held in public trust for recreation, heritage preservation, conservation, and education. They offer a blend of nature, culture, and adventure, providing limitless opportunities for discovery. Visitors can explore these greenspaces through activities such as birding, hiking, swimming, and fishing. Notable sites include:

- Mount Nemo Conservation Area: Located in Burlington, Ontario, Mount Nemo offers beautiful hikes with incredible lookouts from atop the Niagara Escarpment.
- Rattlesnake Point Conservation Area: Recognized as a key component of the Niagara Escarpment Parks and Open Space System, Rattlesnake Point permits activities such as hiking, rock climbing, and nature viewing.
- Crawford Lake Conservation Area, managed by Conservation Halton, is a significant natural and historical site in Halton Region's NEB. It preserves unique geological and cultural features, including a

meromictic lake and a reconstructed 15th-century Iroquoian village. The lake's sediment layers offer insights into the region's environmental history, with evidence of human impact, such as nuclear bomb testing and pollution, preserved within. Geologist Francine McCarthy's research highlights Crawford Lake's potential as a key site for defining the Anthropocene epoch due to its distinct sediment layers, making it a candidate for the 'Golden Spike' designation.

Credit Valley Conservation

Credit Valley Conservation through its conservation programs plays a vital role in protecting, restoring, and managing the natural resources of the Credit River Watershed and its adjacent lands, which include parts of the Niagara Escarpment, Oak Ridges Moraine, and Greenbelt.

Notable Conservation Area Program:

Terra Cotta Conservation Area: Terra Cotta Conservation Area in Halton Hills spans 485 acres across the Niagara Escarpment Biosphere. Owned by Credit Valley Conservation, it offers diverse trails through forests and wetlands. The Centre for Environmental Learning provides nature-based programs like interpretation, hiking, skiing, camping, fishing, and picnicking. Activities revolve around the Bruce Trail, with significant areas designated for forest and wetland conservation.

Near-Urban Nature and Achieving Canada's Protected Areas Target Program

Credit Valley Conservation, in alignment with national goals, aims to safeguard 30% of Canada's lands and oceans by 2030. Collaborating with the Ontario Heritage Trust, they secured Terra Cotta as a Protected Area in 2022. Terra Cotta, a NEB Nodal Park, is among six parks now designated as Protected Areas, alongside Dundas Valley, Crawford Lake, Bruce Peninsula, Mono Cliffs, and Cootes Paradise. This reflects progress since the Auditor General's 2021 audit, which identified only three of these parks as protected.

Toronto and Region Conservation Authority

Source Water Protection Program

The Humber Valley Escarpment Access and Mono Mills Lowlands Escarpment Access provide recreational and headwater protection benefits to the NEB. TRCA's ownership of Glen Haffy Conservation Area, a 462-hectare site at the convergence of the Niagara Escarpment and Oak Ridges Moraine in the NEB, is where the upper Humber River originates with cool spring-fed waters supporting

a resident population of speckled trout. The Bruce Trail spans the site and boasts opportunities for fishing, hiking, picnicking, camping and cross country skiing. Glen Haffy, with its diverse natural features, was designated as a Protected Area in 2018 as part of Canada's goal to protect 30% of lands and oceans by 2030.

Nottawasaga Valley Conservation Authority

Ramsar Site Program Manager

The Nottawasaga Valley Conservation Authority owns and manages Minesing Wetlands, a Wetland of International Importance, known as a Ramsar Site. As one of Canada's only 36 Ramsar Sites, this wetland is recognized for its ecological importance, and is the largest fen bog in southern Ontario and a provincially significant Area of Natural and Scientific Interest. The Nottawasaga River, originating west of the Niagara Escarpment in the Dundalk Till Plains, collects waters from major rivers like Boyne River, Pine River, and Innisfil Creek, as well as numerous smaller ones. Flowing through the Minesing Wetlands, the Nottawasaga River joins with the Mad River and Willow Creek before ultimately reaching Nottawasaga Bay at Wasaga Beach.

Near-Urban Nature and Achieving Canada's Protected Areas Target Program

In 2018, the Nottawasaga Valley Conservation Authority designated Nottawasaga Bluffs Conservation Area as a Protected Area, following a thorough process akin to other conservation authorities. Covering 400 acres on the NEB, it showcases unique geology with deep crevasses amidst diverse forests, open fields, and limestone bluffs. Collaborating with the Bruce Trail Conservancy, the Authority offers extensive hiking trails, providing scenic views and opportunities for exploration in this biodiverse landscape.

Grey Sauble Conservation Authority

Conservation Area and Land Acquisition Program

Grey Sauble Conservation possesses the highest number of properties within the NEB compared to any other Conservation Authority. With ownership of 28 out of the 88 Conservation Areas in the NEB (32%).

Sustainable Forest Management Program

Grey Sauble Conservation is a leader in conservation land management, notably with the Grey Sauble Forest Management Plan (2018) ensuring sustainable practices

across its 23,000 acres of forest spanning Grey and Bruce Counties. This plan guides activities until 2037, aligning with best practices outlined in the 2021 Audit of the Niagara Escarpment Commission, emphasizing the importance of management plans for Conservation Areas, and involving partners, rights holders, and stakeholders in long-term protection efforts.

Ministry of Natural Resources and Forestry (MNFR)

Conservation Land Tax Incentive Program

Enrollment of private landowners in conservation initiatives is facilitated through the Ministry's administration of the Conservation Land Tax Incentive Program. This program allows private landowners to receive a full property tax exemption (100%) for conserving eligible natural heritage features, such as habitats for endangered species or provincially significant wetlands. Presently, there are 2,740 properties covering 24,665.5 hectares within the Niagara Escarpment Biosphere enrolled in this program. This marks an increase of 298 properties over the past five years (since 2017).

Ministry of Environment, Conservation and Parks (MOECP)

Greenland's Conservation Partnership Program

The Ministry of the Environment, Conservation, and Parks established a new land acquisition fund totaling \$20 million over four years. This initiative facilitated the Nature Conservancy of Canada in acquiring lands to safeguard the Saugeen Bruce Peninsula Natural Area on the Niagara Escarpment. Through the Greenland's Conservation Partnership by the Ontario government, collaborative efforts are supported to preserve ecologically significant natural areas, safeguard wetlands, grasslands, and forests, thereby mitigating the impacts of climate change. The government will partially match private and non-provincial contributions to the Nature Conservancy of Canada and the Ontario Land Trust Alliance, aiding in securing, restoring, and managing new protected areas.

Bruce Trail Conservancy (BTC)

The Landowner Stewardship Program

The Landowner Stewardship Program supports landowners who are interested in preserving the environmental values of their property. If you own land along the Bruce Trail, the BTC's Landowner Stewardship Program can assist you with enhancing the wildlife habitat on your property and contributing to the ecological health of the Niagara

Escarpment. The Bruce Trail Conservancy is able to provide guidance and financial support to assist private landowners with planning and implementing habitat restoration projects on their property.

Bruce Trail Land Securement Program

The Bruce Trail Conservancy is dedicated to preserving ecologically significant lands along the Niagara Escarpment. As the most active land securement organization within the NEB, it has played a crucial role in conserving over 7,644 hectares of land since its incorporation in 1963. In the fiscal year 2021-22, the Conservancy invested \$12.3 million to acquire 14 properties spanning 420 hectares along the Escarpment. By 2023, 70.6% of the optimal route for the Bruce Trail had been protected. Notably, only 0.3% of its overall budget was sourced from government grants.

Escarpment Biosphere Conservancy (EBC)

Land Trust and Land Acquisition Program

The EBC, a registered charity, is dedicated to establishing, maintaining, and managing nature preserves within the Niagara Escarpment Biosphere. Their mission includes the preservation of physical features with scientific, ecological, cultural, historic, or scenic significance. The organization aims to maintain, enhance, or restore native species and natural habitats while supporting scientific research and educational services. EBC educates the public on conservation and preservation of the Niagara Escarpment landscape. As the largest Ontario-focused charitable land trust for the Niagara Escarpment, EBC protects over 23,000 acres of land across 229 nature preserves. Through land acquisition, conservation agreements, and fundraising, EBC contributes to Canada's biodiversity and land conservation targets. Their efforts annually safeguard \$34,000,000 worth of ecosystem services, protect 20 km of Lake Huron shoreline from development, and preserve 14 km of Niagara Escarpment slope through 45 slope nature reserves totaling 3,146 acres.

Nature Conservancy of Canada

Land Conservation Program

The Nature Conservancy of Canada (NCC) is the largest national land conservation organization in the country. Since 1962, it has played a pivotal role in preserving over 15 million hectares across Canada. Notably, within a 25-kilometer radius of the Bruce National Park, the NCC has conserved 1,630 hectares to date. The Saugeen Bruce Peninsula, stretching from Southampton and Owen

Sound to Tobermory, represents a significant conservation opportunity due to its status as one of the most intact natural landscapes in Southern Ontario. Recognizing the globally rare species and ecosystems in the Niagara Escarpment Biosphere, known for its diverse native orchids, ferns, and ancient eastern white cedars, the NCC considers it a biodiversity hotspot in the Great Lakes region. The NCC has contributed to protecting over 12,000 hectares on the peninsula through land donations, purchases, and partnerships with First Nations, Conservation Authorities, and other groups. In collaboration with the Saugeen Ojibway Nation since 2014, the NCC has actively engaged in conservation efforts, including mapping at-risk species and habitats, knowledge-sharing, and the management of invasive species.

Parks Canada

Landscape Resiliency Program

Parks Canada, a Government of Canada agency, oversees the management of 47 National Parks, five National Marine Conservation Areas, 171 National Historic Sites, and one National Urban Park. The agency is tasked with safeguarding and showcasing nationally significant examples of Canada's natural and cultural heritage. Parks Canada created the Landscape Resiliency Program, launched in 2023, to work with partners to provide funding to secure biodiversity hotspots such as the Saugeen Bruce Peninsula. This federal funding will expedite habitat protection around Bruce Peninsula National Park, one of the 10 parks prioritized in the new program. The main approaches for land protection entail collaboration with the Nature Conservancy of Canada, involving both land purchases and donations. Additionally, conservation easements with landowners are employed as an extra strategy to ensure the safeguarding of land for landscape resilience and the creation of habitat and wildlife corridors.

The Niagara Parks Commission (NPC)

Established in 1885, The Niagara Parks Commission operates as an agency under the Ministry of Tourism, Culture, and Sport. The Niagara Parks Commission's conservation programs aim to balance the protection of natural and cultural resources with the promotion of tourism and recreation in the Niagara region.

Some of its main conservation programs include:

- **Natural Areas Management:** NPC works to protect and restore natural habitats within its parks, including wetlands, forests, and meadows. This involves habitat

restoration, invasive species management, and biodiversity conservation efforts with the NEB.

- **Historic Site Preservation:** NPC manages numerous historic sites and heritage buildings along the Niagara River, including Queenston Heights Park, and the Laura Secord Homestead, both located within the NEB. In Canada, the Niagara Escarpment Biosphere commences at Queenston Heights (Brock’s Monument) National Historic Site. This location also marks the start (or end) of the Bruce Trail and is recognized as one of the nine Nodal Parks within the NEB.
- **Sustainable Tourism:** NPC promotes sustainable tourism practices to minimize the environmental impact of visitors while maximizing the economic and social benefits to the region. This includes initiatives such as waste reduction, energy conservation, and eco-friendly transportation options.

Ontario Power Generation

Ontario Power Generation (OPG) is a Crown corporation fully owned by the Province of Ontario, Canada, responsible for electricity generation in the province. Located in Queenston, Ontario, along the Niagara River, OPG’s Niagara Operations are within the NEB.

Conservation and Biodiversity Program – Bring back the goats

OPG has piloted a program in at its Niagara operations (all within the NEB) where about 50 goats have been busy chowing down on invasive and fast-growing plants like phragmites and buckthorn, as well as weeds and overgrown vegetation. Now in its third season, the unique environmental program has received much acclaim and interest. With the goats’ help, OPG has been able to reclaim lands that are now healthier and blossoming with wildlife and native species.

Wildlife Habitat Council Biodiversity Program

With a diverse portfolio, OPG actively participates in biodiversity and conservation initiatives. In 2019, OPG earned Gold certification from the Wildlife Habitat Council. This acknowledgment reflects diverse ongoing biodiversity programs such as a nesting box monitoring program initiated in 2007, creating essential habitat for migratory birds. OPG collaborates with Niagara College ecosystem restoration students to improve monitoring and protection of turtle nesting habitats. OPG also conducts a bee box program, welcoming numerous pollinating honeybees each summer in the vicinity of its operations.

Niagara Escarpment Foundation

Research Programs

Established in 2001, the Niagara Escarpment Foundation (NEF) is a charitable organization dedicated to raising awareness and conducting research for the protection of the Niagara Escarpment’s natural and cultural significance. It focuses on evaluating the effectiveness of the Niagara Escarpment Plan in preserving the Escarpment’s ecosystems. NEF also supported the transition of the NEB convenor function to the Niagara Escarpment Biosphere Network (NEBN) in 2019 and provided funding for the completion of the Biosphere’s Periodic Review in 2023.

Ontario Nature

Near-Urban Nature and Achieving Canada’s Protected Areas Target Program

As a key member of the NEB nature network, Ontario Nature takes the lead in the Municipal Protected Areas Project. Collaborating with partners, the organization engages with municipalities and conservation groups throughout southern Ontario, conducting assessments of environmentally significant lands to ascertain their alignment with Canada’s standards for protected and conserved areas. The collective efforts of Ontario Nature have contributed to the inclusion of nearly 10,000 hectares in the Canadian Protected and Conserved Areas Database, a crucial marker for Canada’s progress toward the 30% by 2030 target, with over 162 newly designated Protected Areas within the NEB.

The Greenbelt Foundation

Land Protection Program

The Greenbelt Foundation oversees Ontario’s Greenbelt, a vast expanse of two million protected acres that plays a crucial role in environmental protection and a dependable local food source for the prosperity of Ontario.

Funding Program

As the sole charitable organization devoted exclusively to the well-being of Ontario’s Greenbelt, it holds a pivotal role as the major funding source.

Near-Urban Nature and Achieving Canada’s Protected Areas Target Program

A key partner in the Municipal Protected Areas Project and the Near-Urban Nature Network within the Greater Golden

Horseshoe. Collaborating with various NEBN network partners operating within the NEB, the foundation works to safeguard and link ecological areas and conservation programs in the region.

Royal Botanical Gardens (RBG)

Biodiversity and Conservation Program

Royal Botanical Gardens (RBG), located entirely within the NEB, is Canada's largest botanical garden, a National Historic Site, a Protected Area, and a registered charitable organization. As a key NEBN network partner, RBG focuses on conservation efforts in forest, wetland, and prairie habitats, addressing species at risk inventories and managing invasive alien species. Encompassing 1,100 hectares dominated by nature sanctuaries at the western end of Lake Ontario, RBG's diverse habitats contribute significantly to ecosystems spanning international borders. With over 750 native plant species and a rich array of wildlife, including migratory birds, mammals, reptiles, amphibians, and Lake Ontario fish, RBG plays a vital role in biodiversity. The Gardens, home to four native turtle species, actively engages in wetland restoration and implements a Site-Specific Recovery Plan to protect and restore habitat for turtles and wildlife across its 2,400 acres of protected nature lands.

Habitat Restoration Programs

RBG undertakes efforts to restore and enhance habitats within its gardens and natural areas, focusing on native plant species and ecosystem health.

Species Conservation

RBG is involved in conservation efforts for rare and endangered plant species, including habitat protection, propagation, and reintroduction programs.

Invasive Species Management Programs

RBG works to control and manage invasive plant species that threaten native biodiversity through monitoring, removal, and education initiatives.

Citizen Science Programs

RBG engages the public in biodiversity monitoring and research through citizen science programs, such as bird counts, plant surveys, and ecological monitoring projects.

Research Partnership Programs

RBG collaborates with academic institutions, conservation organizations, and government agencies on research

projects related to biodiversity conservation, ecosystem management, and climate change adaptation.

Trout Unlimited Canada (Niagara Chapter)

Upper Twelve Mile Creek Water Quality and Habitat Improvement Program

Trout Unlimited Canada's Niagara Chapter (NCTUC) is a volunteer-driven conservation organization committed to safeguarding the Twelve Mile Creek, the last remaining cold-water aquatic system in Niagara and situated entirely within the NEB. Through collaboration with local partners and landowners, NCTUC is dedicated to the preservation, protection, and enhancement of Twelve Mile Creek. In 2021, the organization updated its 10-year conservation action plan to further its commitment to the sustainable management of this crucial aquatic ecosystem.

Carolinian Canada

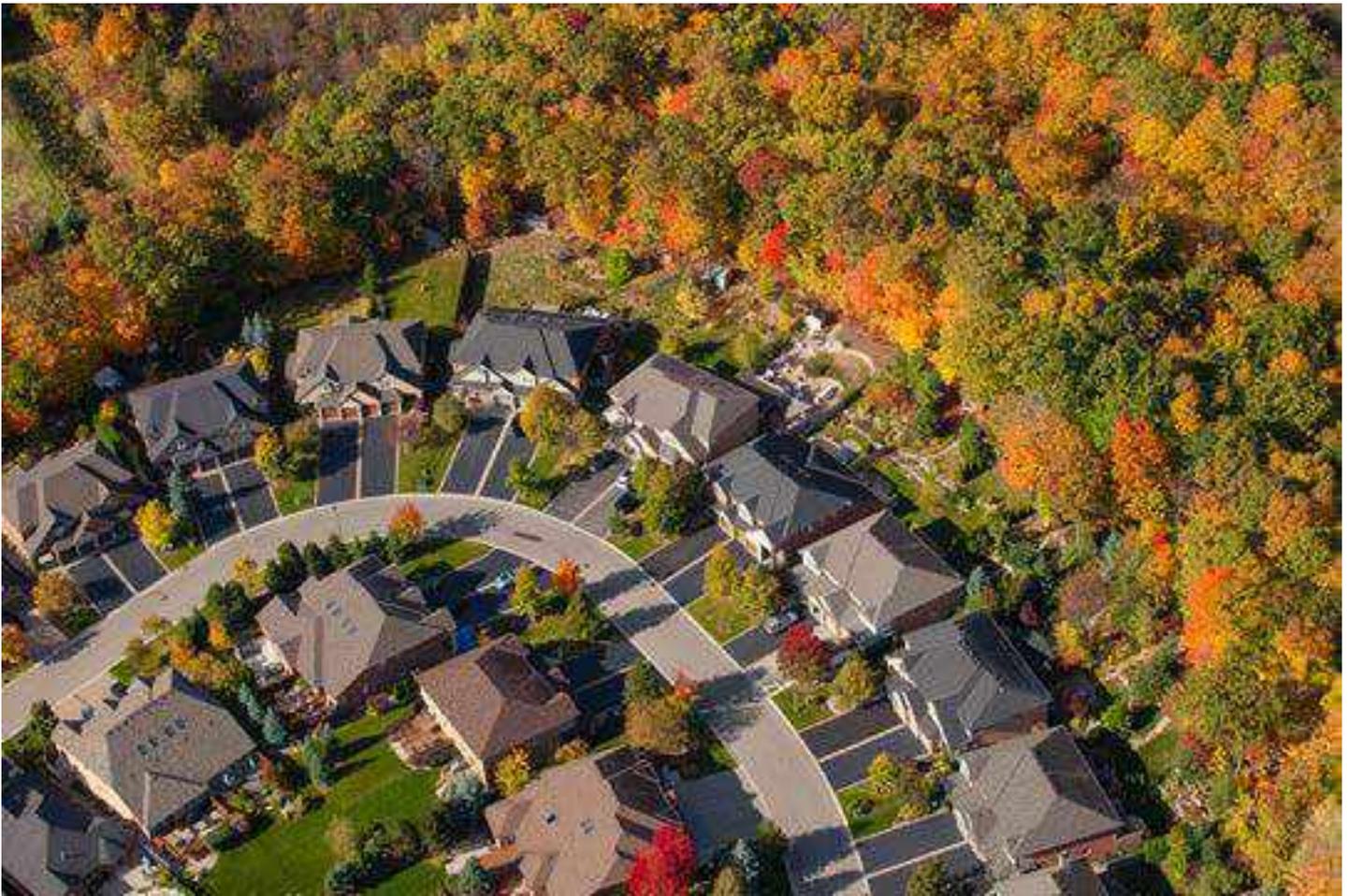
Southern Ontario Seed Strategy and Program

Carolinian Canada is a network of leaders dedicated to fostering healthy landscapes for a sustainable future in the Carolinian Zone. Through collaboration with over 300 groups and 5,000 volunteers spanning 37,000 hectares, they work to preserve local wildlife and water. Given the southern portion of the NEB falls within the Carolinian life zone, their conservation initiatives include the Southern Ontario Seed Strategy. This strategy involves a collective effort to preserve native plants and their seeds in southern Ontario through regular meetings, knowledge sharing, discussions, and working groups.

Landcare Niagara (LCN)

Forests Ontario's 50 Million Tree Program

LCN serves as the local delivery agent for Forests Ontario's 50 Million Tree Program in the Niagara Region, collaborating with numerous NEB landowners. LCN is dedicated to fostering a healthy and sustainable environment in both rural and urban settings. As a community-based, not-for-profit organization, LCN aims to empower citizens with knowledge and engagement in land resource management. Through educational outreach, training initiatives, and land stewardship activities, they provide services and information to both rural landowners and users of private and public lands in Niagara.



New marks on the land: constant demand for new development signals a need for robust policies to protect the Escarpment's irreplaceable ecosystems.

Niagara Restoration Council

Stream and Watershed Rehabilitation Programs

The Niagara Restoration Council (NRC) is a not-for-profit environmental organization whose mandate is to protect, maintain and actively restore the ecosystems of Niagara. The Council originated in 1989 as the Public Advisory Committee (PAC) for the Niagara River Remedial Action Plan. Much of their conservation programming targets restoration action through the implementation of habitat remediation project adjacent to and within Short Hills Provincial Park located within the NEB.

Escarpment Corridor Alliance

Land Acquisition and Securement Program

The Escarpment Corridor Alliance is dedicated to safeguarding Southern Georgian Bay's Niagara Escarpment Biosphere region from large-scale development. The vision is to establish a network of forest corridors and trails, linking over 500 square kilometers of forest, wetlands, and the five watersheds of Blue Mountains, Beaver Valley,

Castle Glen, and Kolapore. The alliance aims to preserve vital green spaces with rich biodiversity, utilizing private landowner options such as OECMs (Other Effective Conservation Measures) and Land Trust conservation agreements. Additionally, the focus is on preventing inappropriate mega developments, creating a strategic natural corridor system, and promoting a Conservation Economy.

Saugeen Ojibway Nation

Saugeen Ojibway Nation holds exclusive Aboriginal and Treaty Rights across the vast majority of the lands and waters of the Saugeen / Bruce Peninsula which includes the entire northern portion of the NEB.

Fisheries – Coastal Waters Monitoring Program

Saugeen Ojibway Nation (SON) and Bruce Power have collaboratively established the SON Coastal Waters Monitoring Program (CWMP) to facilitate a shared comprehension of the developmental impacts and the connection with their land and waters. Focused on integrating SON's Traditional Knowledge into discussions,

the program aims to enhance understanding of the interactions between Bruce Power's operations and the coastal environments of the Territory, thereby fortifying SON's protection of Aboriginal and Treaty Rights. The CWMP not only contributes to positive engagements between SON, Bruce Power, and CNSC but also plays a pivotal role in community capacity building, ensuring Anishnaabe knowledge systems are central to their interpretations. Importantly, the program addresses the absence of a comprehensive baseline dataset for SON Territory, aiming to collect both quantitative and qualitative data to foster a holistic understanding of ecological and environmental conditions. This initiative aligns with SON's broader goal of informed decision-making regarding new developments, climate change, and cumulative impacts in a holistic and inclusive manner.

M'Wikwedong Native Cultural Centre (Owen Sound)

Let's Eat Program

The "Let's Eat" program, rooted in conservation programming, focuses on revitalizing traditional food systems through hunting, fishing, gardening, and facilitating access to traditional foods, medicines, and teas. The M'Wikwedong Indigenous Friendship Centre, situated in the NEB, is a grassroots initiative led by a core group of 50 Indigenous community members from Owen Sound. The center was established to meet the social, spiritual, mental, and physical needs of the urban Indigenous population. It provides a secure environment for Indigenous peoples to engage with their community and works to break down cultural and systemic service barriers between local Indigenous and non-Indigenous populations.

Bagida'waad Alliance

Climate Change Research Program

The Bagida'waad Alliance, led by the Chippewas of Nawash Fishing Families, operates as a non-profit dedicated to climate research in the Lake Huron and Georgian Bay waters. The alliance actively promotes youth engagement through the sharing of Elder stories about fish and undertakes part in the active stewardship of lands and waters.

Chippewas of Nawash

Fisheries Assessment Program

The Chippewas of Nawash Unceded First Nation, located in Neyaashiinigiimiing on the Saugeen Peninsula, operates the

Fisheries Assessment Program. This long-term initiative collects vital biological data from commercially harvested fish in Lake Huron/Georgian Bay. The data informs the management of fish stocks and guides the Nawash Council in making sound decisions for their fishery. The Assessment database contains a comprehensive historical record of commercial fish harvest and associated biological data from 1995 to the present.

Six Nations of the Grand River Territory

Wildlife Management Program

The Six Nations of the Grand River unify all Haudenosaunee peoples under the Great Tree of Peace. They are currently the only First Nation community that includes all six Haudenosaunee nations. Located along the banks of the Grand River, with traditional territory within the NEB, the Six Nations of the Grand River is the most populous First Nation in Canada. The Six Nations Wildlife Management Office focuses on enhancing environmental stewardship based on the Mother Earth stewardship indicators from the 2019 community plan. These indicators include increased water quality, improved soil health, expanded tree canopy, and heightened biodiversity. The goals include a larger forested territory, safe consumption of food and medicines from forests and rivers, and the restoration or strengthening of plant and wildlife species in these areas.

Bruce Peninsula Biosphere Association

Community Conservation and Stewardship Program

The Bruce Peninsula Biosphere Association, established in 2000, is a non-profit charity dedicated to fostering a healthy environment. Guided by UNESCO World Biosphere Region principles, it aims to engage the community in conservation and sustainable development efforts. Led by a volunteer board representing diverse interests, including conservationists, farmers, and business owners, the Association works towards achieving environmental goals and building a vibrant and sustainable community on the Bruce Peninsula.

In September 2012, the Bruce Peninsula Biosphere Reserve Association launched a five-year Community Conservation and Stewardship Plan covering 1750 sq km. It guides local actions addressing ecological, social, and economic concerns through unified vision, collaboration, biodiversity information, and resource strengthening. Developed through extensive public engagement, involving 700+ individuals, the plan addresses habitat loss, hydrological

Table 4.2. Main conservation partners and programs in the NEB

Conservation Program Partner	Main Goals	Activities
Land Stewardship including land acquisition, fundraising, advocacy		
Saugeen Ojibway Nation (SON) includes the Saugeen First Nation and the Chippewas of Nawash	SON holds exclusive Aboriginal and Treaty Rights across the vast majority of the lands and waters of the Saugeen / Bruce Peninsula which includes the entire northern portion of the NEB.	SON through treaties with the Crown, shares their land with visitors and community members. Guided by Natural Law, they uphold their duty as stewards of the land and have established the Saugeen Ojibway Nation Environment Office to fulfill this responsibility.
Mississaugas of the Credit First Nation	The traditional territory of the Mississaugas of the Credit encompasses much of the NEB and Greater Golden Horseshoe region of Southern Ontario.	Currently they are working to revitalize their reserve grounds with the purpose to let the grounds grow back to their natural state to build resiliency.
Six Nations of the Grand River Territory	Through the establishment of the Six Nations Wildlife Management Office, particular attention is paid to the progress indicators listed in the stewardship section of their recent (2019) the community plan.	Conservation activities focus on food safety through education, habitat protection and growing programs ensuring the community can safely consume food and medicines from local landscapes.
Conservation Authorities (CAs)	There are seven CAs operating within the NEB. A key role is programs to promote collaboration with the NEB network partners for effective watershed management and environmental conservation.	All CAs undertake land stewardship programs which includes land acquisition for the protection of NEB lands. A large portion of the Niagara Escarpment Parks and Open Space System are owned by CAs.

Parks Canada (PC)	PC works to secure nationally significant examples of Canada's natural and cultural heritage.	PC owns and manages Bruce National Parks and Five Fathoms Marine Parks within the NEB. Parks Canada in 2023, to work with partners to provide funding to secure biodiversity hotspots such at the Saugeen Bruce Peninsula.
Nature Conservancy of Canada (NCC)	NCC is Canada's largest national land conservation organization.	Through strategic land acquisition, NCC owns and protects 1,630 ha within and surrounding the Bruce National Park area of the NEB.
Ministry of Environment, Conservation, and Parks (MOECP)	Launched in 2020, MOECP Greenland's Conservation Partnership helps secure land to conserve ecologically important natural areas.	This program has helped NCC acquire lands to protect portions of the NEB in the Saugeen Bruce Peninsula.
Ministry of Natural Resources and Forestry (MNRF)	MNRF administers the Conservation Land Tax Incentive Program	The program enables private landowners to receive a 100% property tax exemption for conserving eligible natural heritage features on their property. Currently there are 2,740 properties covering 24,665.5 hectares within the NEB, an increase by 298 properties since 2017.
Bruce Trail Conservancy (BTC)	BTC works to preserve the NEB's ecologically significant lands. The BTC is focused on securing land for the Bruce Trail and is the most active land securement organization within the NEB. 91 species of Conservation Concern recorded on BTC-managed land	As of 2023, 70% of the optimum route for the Bruce Trail has been protected by BTC. In 2021-22, BTC spent \$12.3 million to acquire 14 properties covering 420 hectares along the NEB. In 2022 - 37,067 trees planted to restore forest canopies along the Bruce Trail

Escarpment Biosphere Conservancy (EBC)	EBC is the largest Ontario land trust protecting the NEB with the aim to support scientific research and educate the public about conservation of the NEB.	EBC conservation programs include land acquisition (purchase and donation), protecting over 23,000 acres of land, on 236 nature preserves.
Ontario Nature (ON)	ON goal is to protect and restore nature to reverse the ongoing trend of biodiversity decline in Ontario and build grassroots capacity for nature conservation.	As an important NEB nature network member, Ontario Nature is the lead for the Municipal Protected Areas Project. ON's efforts have resulted in over 162 newly designed Protected Areas within the NEB.
The Niagara Parks Commission (NPC)	The NPC's mission is to protect the natural and cultural heritage along the Niagara River.	The NPC owns Queenston Heights (Brock's Monument) National Historic Site, one of the nine Nodal Parks within the NEB and where the beginning of the Bruce Trail is situated.
Niagara Escarpment Foundation (NEF)	NEF's mission is to promote public awareness of the natural and cultural significance of the Niagara Escarpment and to conduct research for its protection.	NEF played a crucial role in the transition of the NEB convenor function to the Network. In 2023, NEF provided funding to assist the Network in completing the Periodic Review.
The Greenbelt Foundation (GF)	GF is the sole charitable organization dedicated to the Greenbelt's health and includes Network partners collaborating to preserve and link ecological areas within the NEB.	GF was a primary funder in the Municipal Protected Areas Project and Near-Urban Nature Network establishing protected areas in the NEB.
Bay Area Restoration Council (BARC)	BARC works to connect the people of Hamilton and surrounding areas to the water and ecology of the harbour.	As part of the NEB, the Council undertakes conservation action to revitalize Hamilton Harbour and its watershed through education and engagement.

Escarpment Corridor Alliance (ECA)	The ECA safeguards Southern Georgian Bay's NEB from large-scale development. The goal is to create a strategic natural corridor system and foster a Conservation Economy.	Conservation programs involves preserving biodiverse green spaces through private landowner agreements while preventing inappropriate development.
Habitat Restoration		
Ontario Power Generation (OPG)	OPG is responsible for the generation of electricity in the province and operates a diverse portfolio of biodiversity and conservation programming in the NEB.	OPG's Niagara Operations, situated entirely within the NEB, received Gold certification from the Wildlife Habitat Council (WHC) in 2019 for the second time.
Conservation Authorities (CAs)	CAs ensure the conservation, restoration, and responsible management of water, land and habitats through programs that balance human, economic, and environmental needs.	All seven NEB CAs undertake habitat restoration programs, working with landowners. CAs work closely with many NEB partners, including Forests Ontario, to deliver the Federal government's 2 Billion Trees Program.
Conservation Ontario (CO)	CO is the umbrella organization of Ontario's 36 CAs which helps to foster partnerships such as the 2 Billion Trees Program.	In 2022, CAs planted approximately 2 million trees across Ontario's Watersheds, they also continued to map and monitor local forest cover.
Royal Botanical Gardens (RBG)	RBG is a National Historic Site, and a Protected Area, located entirely within the NEB. Royal Botanical Gardens is a key Network partner.	Through restoration efforts RBG works to protect and restore habitat for all wildlife across their 2,400 acres of protected nature lands.
Landcare Niagara	LCN is a not-for-profit community-based organization mandated to provide land stewardship and habitat services to rural landowners in Niagara.	LCN is the local delivery agent for Forests Ontario's 50 Million Tree Program since 2007 working with many NEB landowners.

Niagara Restoration Council (NRC)	The NRC is a not-for-profit environmental organization whose mandate is to protect, maintain and actively restore the ecosystems of Niagara.	Much of their conservation programming targets restoration action through the implementation of habitat remediation project adjacent to and within Short Hills Provincial Park located within the NEB.
Trout Unlimited Canada - Niagara Chapter (NCTUC)	NCTUC is a volunteer-based conservation group dedicated to preserving the last cold-water aquatic system in Niagara, Twelve Mile Creek.	Located entirely within the NEB activities include working with private landowners on habitat projects such as “buffer in a box” to improve spawning habitat for brook trout. They run the elementary school education program - bring back the brookies to increase knowledge about the important ecosystem.
Invasive Species Management		
Ontario Invasive Species Centre (OISC)	The OISC supports the regulation of invasive species to help protect Ontario’s lakes, lands and forests and avoid future ecological and economic costs	OISC supports the NEB as invasive species threats have increased, including a doubling of the number of nonnative plants found on the Escarpment in the last 40 years. 18 different invasive species have been identified in the NEB, and aggressive invasive species were found at 56 of 88 (or 64%) sampling plots.
Ontario Phragmites Network (OPN)	The OPN brings together partners including government agencies, non-profit organizations, researchers, and community members, to address the challenges posed by the spread of Phragmites in Ontario.	Working with Niagara College within and adjacent to the NEB, In 2022 over 6 acres of Phragmites has been mapped with removal strategies on-going.

Royal Botanical Gardens (RBG)	In 2022, RBG embarked on a ground-breaking 25-year Master Plan.	RBG is home to more than 750 native plant species, 277 species of migratory birds, 37 mammal species, 14 reptile species, 9 amphibian species and 68 species of fish. The Master Plan will help guide invasive species management within this area of the NEB.
Water Quality Protection		
Saugeen Ojibway Nation (SON)	SON Fisheries Coastal Waters Monitoring Program	The program aims to enhance the understanding of the interactions between Bruce Power's operations and the coastal environments of the Territory, thereby fortifying SON's protection of Aboriginal and Treaty Rights.
Conservation Authorities (CAs) in partnership with the Ontario Ministry of Environment, Conservation and Parks (MOECP) and Source Water Protection.	CAs in the NEB play a crucial role in water quality protection through various initiatives and programs including a key partnership with MOECP Provincial Water Quality Monitoring Network.	As many headwater systems originate from the NEB including groundwater, regular water monitoring in partnership with MOECP is conducted to assess the quality of water within their jurisdictions. There are over 1000 sampling sites within the NEB. CAs contribute to source water protection programs, which involve identifying and safeguarding drinking water sources.
Local Municipalities	Municipalities are responsible for managing wastewater treatment facilities to ensure sewage and other pollutants are treated before being discharged into water bodies.	There are 34 municipalities in the NEB working with the 7 CAs to implement stormwater management plans, including the use of green infrastructure to control and filter runoff. Municipalities work with CAs to implement source water protection plans.

Research and Monitoring		
University of Waterloo - Climate Risk Research Group	An interdisciplinary team working to support climate change adaptation by providing evidence-based policy advice to inform conservation programming	Developing strategies that will help communities to adapt to climate change using nature-based solutions, technology, planning, and land use changes,
Royal Botanical Gardens – Biodiversity and Horticultural Research	Monitoring and research initiatives related to plant conservation, biodiversity, and environmental sustainability.	Surveys and monitoring of plant and animal species within the gardens. Documentation and cataloguing of plant species to contribute to biodiversity databases. Research on plant cultivation, propagation, and breeding for ornamental and conservation purposes.
Conservation Authorities – Watershed Report Cards	Conservation Authorities monitor and map key indicators to report on watershed and water quality health.	Key assessment indicators collected are surface and ground water quality, forest health, wetland percent, and percentage of impervious land use cover
Niagara Escarpment Foundation	Founded to encourage public awareness of the natural and cultural significance of the Niagara Escarpment and to conduct research related to it's protection.	The Foundation has undertaken a number of conservation research projects, primarily related to the effectiveness of the Niagara Escarpment Plan in protecting the Escarpment from inappropriate development and conserving its sensitive ecosystems.
Beaver Valley and Niagara College Biodiversity Project – iNaturalist data capture and documentation	iNaturalist is a crowd source flora and fauna identification tool that generates data for science and conservation. The NEB has many partners using iNaturalist within the NEB project site created for the entire Biosphere boundary.	Using the iNaturalist App. participants document flora and fauna along the NEB iNaturalist Project site. Contributions from the NEB community has seen over 180,000 observations documenting over 6,800 species to date.

Chippewas of Nawash	The Chippewas of Nawash Unceded First Nation, located in Neyaashiinigmiing on the Saugeen Peninsula, operates the Fisheries Assessment Program.	This long-term initiative collects vital biological data from commercially harvested fish in Lake Huron/Georgian Bay. The data informs the management of fish stocks and guides the Nawash Council in making sound decisions for their fishery. The database contains a historical record of biological data from 1995 to the present.
Climate Change Adaptation		
Bagida'waad Alliance	The Bagida'waad Alliance, led by Chippewas of Nawash Fishing Families, is a not-for-profit who undertake climate research on the waters of Lake Huron and Georgian Bay.	Their activities encourage youth to hear the stories of the Elders about the fish and undertakes active stewardship of the lands and waters.
Conservation Ontario	Working with Environment and Climate Change Canada over three years since 2021 through the Nature Smart Climate Solutions Fund	Investing over 9 million dollars into local projects that support the reduction of greenhouse gases through nature based solutions such as wetland, grassland, and land conversion management such as permanent cover practices
Local Municipalities including Conservation Authorities – Community Based Adaptation Programs	Address changes in precipitation patterns and water availability due to climate change. Reduce the impact of extreme weather events by providing timely warnings and preparedness measures.	Implement water-efficient technologies, promote water conservation practices, and develop sustainable water management plans. Enhance urban resilience by increasing green spaces in cities.

<p>Carolinian Canada - Southern Ontario Seed Strategy</p>	<p>Conserve genetic diversity of plant species with a focus on creating resiliency within nature and agricultural systems.</p>	<p>Collaborative partnership where participants gather monthly to work together to preserve (seed collection and storage) and to share knowledge to ensure the availability of diverse and resilient native plants.</p>
<p>Brock University – Niagara Adapts</p>	<p>Niagara Adapts is a novel partnership between Brock University and municipalities in the Niagara Region.</p>	<p>The partnership developed a community of practice for climate change adaptation planning to build climate resilience in the region through education, green infrastructure, and water control and conservation programs.</p>
<p>University of Waterloo Climate Institute</p>	<p>The University of Waterloo Climate Institute brings together scientists and students to provide research and education.</p>	<p>As a Network research network partner, the Institute helps business, governments, and civil society to respond to the climate crisis.</p>

changes, and water quality issues. The Steering Committee of 23 organizations guides the process and supports plan implementation.

4.3 In what ways are conservation activities linked to, or integrated with, sustainable development issues (e.g. stewardship for conservation on private lands used for other purposes)?

Conservation activities within the Biosphere are directly connected with sustainable development concerns, utilizing a range of initiatives. The conservation of biodiversity takes precedence, with a focus on safeguarding the diverse ecosystems and species in the Biosphere. This prioritization contributes to overall environmental health, supporting sustainable development by ensuring the maintenance of crucial ecological services and long-term resilience.

Another critical aspect of conservation in the Biosphere revolves around ecosystem health. Activities are dedicated to maintaining and restoring the well-being of ecosystems, recognizing their crucial role in sustaining biodiversity, regulating climate, and providing clean air and water. This approach aligns with sustainable development goals, emphasizing a balance between environmental, social, and economic considerations.

Sustainable land use planning is integral to conservation efforts in the Biosphere, ensuring that human activities are in harmony with the ecological integrity of the area. This involves measures to prevent habitat fragmentation, encourage sustainable agriculture, and guide responsible development practices. Addressing climate change is a vital component of conservation activities in the Biosphere. Initiatives focus on mitigating greenhouse gas emissions and enhancing ecosystem resilience, contributing to sustainable development goals by advocating practices that reduce the region's vulnerability to climate impacts.

Community engagement is actively promoted in conservation initiatives, involving local communities, and empowering them. By incorporating local knowledge and values, these efforts align with the principles of sustainable development, recognizing the significance of social and cultural factors in long-term environmental management. Educational programs within the Biosphere's conservation framework raise awareness about biodiversity, ecosystem health, and sustainable living practices. This community education fosters a sense of responsibility and encourages environmentally conscious behaviors, supporting broader sustainable development objectives.

Tourism is a significant economic activity in Ontario.

Tourism on the Escarpment contributes an estimated \$100 million annually to local economies, according to the Office of the General Auditor of Ontario report of 2022.. The Biosphere is a destination for travelers and those looking for recreational opportunities, providing a major annual boost to local and regional economies through tourism. Sustainable tourism is integrated into conservation strategies, emphasizing responsible visitor management to minimize environmental impacts where possible. By promoting eco-friendly tourism practices, conservation efforts in the Biosphere contribute not only to environmental protection but also to the sustainable economic development of the region.

Collaboration and partnerships play a crucial role in the Biosphere's conservation activities, involving partners such as government agencies, Indigenous communities, non-profit organizations, and local businesses. These collaborative efforts foster a holistic and integrated approach to conservation and sustainable development, recognizing the interconnectedness of environmental, social, and economic factors.

4.4 How do you assess the effectiveness of actions or strategies applied? (Describe the methods, indicators used).

The need for monitoring the effectiveness of the NEP policies in achieving the objectives of the Niagara Escarpment Planning and Development Act (NEPDA) and Plan was originally identified in the Implementation Proposals (Ministry of Municipal Affairs, 1996), which accompanied the release of the NEP in 1985. The proposals identified that a monitoring system should be established to ensure that the policies in the Plan are implemented and that decisions on proposals are consistent with the objectives and policies of the Plan.

An environmental monitoring program was mandated under the 2005 NEP with an objective to determine whether the policies of the Plan are meeting the goals and objectives of the NEPDA. It was intended that monitoring results would contribute to day-to-day planning decisions, inform NEP amendments and policy reviews and the development of State of the Escarpment Reporting.

The Commission has been working on the monitoring of selected indicators for targeted natural heritage theme areas over a number of years. Monitoring is occurring at the site and landscape levels, and relies on various partnerships for implementation of data collection and analysis. As part of a larger provincial, national and international network, government, conservation agencies, academic institutions



Historic site of The Battle of Queenston Heights, Brock Monument stands like a dawn sentinel facing the American side of the Niagara River.

and non-government organizations are undertaking forest biodiversity monitoring in five permanent plots within the Biosphere. A partnership with the University of Waterloo (UW) Environment and Resource Studies was in place from 1996 to 2019. In this partnership, Commission staff instructed University of Waterloo (UW) Environment and Resource Studies students in the collection of forest biodiversity and tree health monitoring each year, at one of the five permanent forest plots located in the Biosphere's protection area. The Escarpment forest plots were monitored by the UW students on a five-year rotation for temporal changes in forest biodiversity, growth, mortality, health and regeneration. The partnership with the University of Waterloo was terminated in 2020 due to its changing academic program. The plot-based monitoring program is heralded as a resounding success and is among the longest running plot-based biodiversity monitoring programs in Ontario. The Commission is currently looking into the development of alternative partnerships and agencies who may wish to continue the legacy of monitoring on these sites into the future.

NEP 2017 includes a section on Performance Indicators and Monitoring (p 8 - Introduction). It states:

In coordination with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Growth Plan for the Greater Golden Horseshoe, and consistent with the Provincial Policy Statement, performance indicators will be

developed and performance monitoring will be undertaken as follows:

1. The Province, in consultation with the Commission, municipalities, other public bodies and stakeholders, will develop a set of performance indicators to measure the implementation of the policies in this Plan. The Province will monitor and report on the effectiveness of the policies in this Plan, including examining performance indicators concurrent with any review of this Plan.
 2. The implementing authority will monitor and report on the implementation of this Plan's policies within the Niagara Escarpment Plan Area, in accordance with any data standards and any other guidelines that may be issued by the Province.
 3. The Province may require the implementing authority to provide information and/or data to the Province to demonstrate progress made towards the implementation of this Plan.
 4. The implementing authority shall consider performance indicators and monitoring information in the day-to-day implementation of this Plan, when considering Plan amendments and during periodic reviews of the Niagara Escarpment Plan under Section 17 of the Niagara Escarpment Planning and Development Act.
- Note:** These performance indicators and monitoring measures may also include measures for 5 (development) and 6 (logistics).

Forest Biodiversity Monitoring from Commission Annual Reports 2013-23

As part of a larger provincial, national and international network, government, conservation agencies, academic institutions, and non-government organizations are undertaking forest biodiversity monitoring in five permanent plots within the Niagara Escarpment UNESCO World Biosphere Reserve. A partnership with the University of Waterloo (UW) Environment and Resource Studies was in place from 1996 to 2019. In this partnership, Commission staff instructed University of Waterloo (UW) Environment and Resource Studies students in the collection of forest biodiversity and tree health monitoring each year, at one of the five permanent forest plots located in the Biosphere's protection area. The Escarpment forest plots are monitored by the UW students on a five-year rotation for temporal changes in forest biodiversity, growth, mortality, health and regeneration.

These plots are located in deciduous forest and range in size from one-hectare to 20m x 20m, depending on project objectives and available resources. The purpose of these one-hectare plots is to collect quantitative data on forest biodiversity, growth, mortality and health to examine change over time in Niagara Escarpment forests. This information may be used to assess the impacts of development, recreational uses, tree disease, forest pests, invasive species and climate change on forest ecosystems and the effectiveness of NEP policies in protecting core areas of the NEP.

Standard protocols were carried out to collect data on tree species, diameter-at-breast height, height classification, tree health assessment, shrub and sapling and ground cover layer sampling. The Commission's role in monitoring is derived from NEP policies that recognize the need for monitoring and development of performance indicators. In addition, the Commission's monitoring work is an example of the collaborative relationships envisioned in functioning Biosphere reserves. Many Biosphere reserves in Canada undertake similar monitoring, which provides a network of sites with data that can be used to assess impacts of sustainable development initiatives.

In spring of 2012, organizations involved in forest biodiversity plot monitoring along the Escarpment formalized a group—The Escarpment Forest Plot Network (EFPN)—to provide a forum for discussion and to share knowledge about monitoring protocols, data management, analysis techniques and advances in science related to forest biodiversity. The formation of the EFPN and the plot

work helps fulfill one of the key functions of Biosphere regions—to provide support for research, monitoring, education and information exchange. Coordinated and led by Commission staff, the purpose of the group is: i) to facilitate a supportive network and a forum for discussion for those undertaking similar forest biodiversity work within the Niagara Escarpment Biosphere Reserve; ii) to provide an opportunity for agencies and organizations to work collaboratively to achieve project objectives through sharing information on data collection, analysis and management based on the latest science.

The formation of the group expands and contributes to the Commission's existing plot network data.

In 2013-14, the EFPN focused on the opportunities for integration of Vegetation Sampling Protocol (VSP) protocols in the plots, and compatibility with the current protocols. VSP was developed in conjunction with the MNRF and the Faculty of Forestry at the University of Toronto and is used to collect baseline data on the forest and associated vegetation and is intended as a long-term monitoring program to detect change.

Students gain skills in implementing monitoring protocols, vegetation identification, and sustainable land use planning. The program contributes to long-term indicator monitoring for measuring the effectiveness of NEP policies and supports the UNESCO Biosphere objectives of research, monitoring, and education. Short-term trends analyzed indicate that the land use and management activities within the NEP are providing effective protection to the Escarpment forest types represented by the plots. However, the presence of exotic invasive species is becoming more prevalent and has the potential to impact the quality of these natural areas.

In 2016-17, the Commission prepared a discussion paper on the topic of Environmental Monitoring during the Coordinated Plan Review. The Commission collaborated with the MNRF and Ministry of Municipal Affairs (MMA) regarding the Plan's commitment for environmental monitoring and development of performance indicators as part of the Co-ordinated Provincial Plan Review and future NEP implementation.

In 2020, the partnership with the University of Waterloo was terminated due to its changing academic program. The plot-based monitoring program is heralded as a resounding success and is among the longest running plot-based biodiversity monitoring in Ontario. The Commission is currently looking into the development of alternative



Network co-chair Charlene Winger-Jones identifies native species during a visit to the Canoe Garden at Souharissen Natural Area in Waterdown. The 55-acre natural area honours the region's Indigenous history and identity, and is the site of the first Mississauga sacred fire in generations.

partnerships and agencies who may wish to continue the legacy of monitoring on these sites into the future.

The following are the forest plots that were monitored in the last 10 years.

- August 2012 - the Hockley Valley Provincial Nature Reserve.
- August 2013 - Cabot Head Provincial Nature Reserve in Bruce County.
- August 2014 - Hope Bay Forest Provincial Nature Reserve in Bruce County. This plot was first inventoried in 1999 and is within the Escarpment Natural Area Designation of the NEP.
- August 2015 - Hilton Falls plot (Halton Agreement Forest). This was its 5th inventory and marked the 20th anniversary of the plot-based monitoring along the Escarpment.
- August 2017 - Hockley Valley Nature Reserve forest biodiversity monitoring plot, located in the Township of Mono, Dufferin County. This marked the fifth inventory of the plot, representing 20 years of data collection.
- August 2018 - Cabot Head Provincial Nature Reserve forest (Bruce County) and marked the fifth inventory of the plot, representing 20 years of data collection.
- August 2019 - Hope Bay Nature Reserve in Bruce County and marked the fifth inventory of the plot, representing 20 years of data collection.

- 2020 was the last year for the monitoring partnership with the University of Waterloo

4.5 What are the main factors that influenced (positively or negatively) the successes of conservation efforts in the entire Biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be most effective for conservation for sustainable development?

The conservation of the Biosphere is a shared responsibility and a collective duty. As a designated World Biosphere, the Biosphere is a component of a global network of locations where communities reside and engage in endeavors acknowledged for their commitment to advancing solutions for biodiversity conservation and the responsible utilization of resources. The successes of conservation efforts in the Biosphere have been influenced by many factors, both positively and negatively. On the positive side, strong community engagement has played a pivotal role. Local communities actively involved in conservation initiatives bring valuable insights, support, and a sense of ownership. For instance, the Bruce Trail Conservancy (BTC) is a non-profit organization based in Ontario, Canada, dedicated to the preservation and maintenance of the Bruce Trail. The Bruce Trail is the longest marked continuous footpath in Canada, extending approximately 900 kilometers along the Niagara Escarpment. As the biggest largest and most active land trust in Ontario, the BTC is an active steward of the Biosphere, helping to secure the trail route, with 70% of the preferred route established and publicly accessible.

Collaborative partnerships with Indigenous communities, such as sustainable land management practices rooted in traditional knowledge, have contributed positively to biodiversity preservation. The Saugeen Ojibway Nation (SON) holds exclusive Aboriginal and Treaty Rights over the Saugeen/Bruce Peninsula, encompassing the majority of the northern Biosphere. Collaborating with Bruce Power, SON has established the Coastal Waters Monitoring Program (CWMP) to understand developmental impacts on their lands. Integrating Traditional Knowledge, the program enhances comprehension of interactions between Bruce Power's operations and coastal environments, strengthening SON's protection of rights. The CWMP fosters positive engagements, supports community capacity building, and addresses the lack of baseline data for SON Territory. It aligns with SON's goal of informed decision-making on new developments, climate change, and cumulative impacts in a holistic manner.

The formation of impactful partnerships and collaborations has played a pivotal role. Cooperative efforts involving government agencies, non-profit organizations, and local businesses have enabled the development of comprehensive conservation strategies. An illustration of this is the collaboration between the Biosphere and educational institutions, such as the St. John's Outdoor Education Centre. This collaboration, involving the Catholic School Board of Niagara, Brock University, Niagara Regional Native Centre, and the Niagara Peninsula Conservation Authority, emphasizes outdoor education programming within the Biosphere (Pelham). The focus is on delivering authentic cultural, spiritual, and environmental lessons.

However, challenges also exist. Limited financial resources and funding constraints often hinder the scale and impact of conservation efforts. The ever-increasing pressures from urbanization and infrastructure development pose significant threats to the Biosphere. Encroachment on natural habitats and fragmentation of ecosystems negatively impact biodiversity. In 2015 and 2020, the Ontario Biodiversity Council reported that natural areas in the southern portion of the Escarpment and its adjacent lands were highly fragmented and not well connected, raising concern about the maintenance of the continuous natural environment. Additionally, the Commission, with land-use planning oversight of the Biosphere, does not have a long-term strategic plan to achieve the legislative mandate to conserve the Niagara Escarpment. The Commission has not developed a new strategic plan since the 2012–2016 plan expired. The

development of a new plan is an important aspect for guiding and supporting the strategic direction for the Biosphere.

The effectiveness of conservation initiatives is also influenced by public awareness and education. As an example, the Ministry administers the Conservation Land Tax Incentive Program that enables private landowners to receive a 100% property tax exemption for conserving eligible natural heritage features, such as the habitats of endangered species or provincially significant wetlands. The Ministry does not publicly report on participation levels in this program on the Escarpment. In 2022, there were 2,740 properties covering 24,665.5 hectares in the Biosphere enrolled in this program, an increase of 298 properties since 2017.

While educational programs contribute positively, insufficient awareness or misunderstanding of conservation goals can impede success. Promoting responsible tourism is a case in point, where educating visitors about minimizing environmental impact is crucial for sustainable tourism practices.

The successes of conservation efforts in the Niagara Escarpment Biosphere are shaped by factors such as community engagement, partnerships, and effective collaborations, while challenges like financial constraints, urbanization pressures, and the impacts of climate change need to be addressed for sustained success.

Given the experiences and lessons learned in the past ten years, it is important to prioritize the completion of a comprehensive, long-term strategic plan to fulfill the legislative mandate for conserving the Niagara Escarpment. Collaborating closely with the Network, the Commission should prioritize the creation of a strategic plan in partnership with the Ministry of Natural Resources and Forestry. This plan should detail specific actions, complete with timelines, to be undertaken with network partners. There should also be an annual public reporting mechanism to transparently communicate progress towards achieving the strategic objectives.

4.6 Other comments/observations from a Biosphere reserve perspective.

None at this time.

5. THE DEVELOPMENT FUNCTION

5. THE DEVELOPMENT FUNCTION:

[This refers to programmes that address sustainability issues at the individual livelihood and community levels, including economic trends in different sectors that drive the need to innovate and/or adapt, the main adaptive strategies being implemented within the Biosphere reserve, and initiatives to develop certain sectors such as tourism to complement and/or compensate for losses in other markets, employment, and community well-being over the past ten years]

5.1 Briefly describe the prevailing trends over the past decade in each main sector of the economic base of the Biosphere reserve (e.g. agriculture and forest activities, renewable resources, non-renewable resources, manufacturing and construction, tourism, and other service industries).

Some communities close to the Escarpment have experienced very rapid population increases in recent years, such as the Town of Milton which grew by 21% from 2016 to 2021. In 2022, more than 9.2 million people were estimated to live in the Greater Golden Horseshoe, and that number is expected to exceed 14 million by 2051.

This population growth in and around Southern and Central Ontario has ancillary impacts on the Biosphere including the increased demand for natural resource materials such as aggregates and developable land to support housing and infrastructure projects.

The 2023-26 Commission Business Plan asserts that aggregate supply is a key component of economic development in Ontario. It is required for constructing residential, commercial, and industrial buildings, and also supporting infrastructure such as transportation and utility corridors, water and wastewater systems, and for consumer and industrial uses. The 2010 Ontario State of Aggregate Resources Study (SAROS) indicated that over a 20-year span, Ontario consumed an average of 164 million tonnes of aggregate per year. Future consumption projections for the next 20 years average about 186 million tonnes (including recycling) per year, or 13 percent higher than in the previous 20 years. There are approximately 317 million tonnes of high-quality limestone/dolostone reserves close to the GTA market.

The Niagara Escarpment has historically been a prime aggregate resource location because of its proximity to market and the high quality of its aggregate resources. As a result of extraction over the years, many of the existing pits and quarries on the Escarpment are nearing depletion, and may either close and be rehabilitated or expanded to maintain operations. The impacts of expansion, or new operations, encompass surface and groundwater hydrology, natural and cultural heritage, scenic values, and an assortment of community interests. Alternative sources of aggregate resources are available elsewhere but may be at greater distances from their markets or may be available through subsurface mining.

Agricultural activity in the Greenbelt plays an essential role in shaping the landscape and economy of southern Ontario. The Niagara Escarpment has been included in Greenbelt and makes up 25% of the total Greenbelt area. Ontario's Greenbelt has approximately two million acres of protected agricultural and environmentally sensitive lands that surround Ontario's largest centre of population.

With just under 750,000 acres of farmland, the Greenbelt encompasses most of the core of the Golden Horseshoe and accounts for just over 6 percent of Ontario's farmland, including some of Ontario's most productive agricultural land.

The nature of agriculture within the Biosphere is highly varied. For example, within the Niagara Region, predominant production includes wineries, tender fruit, horticulture, and field crops. The central portions of the Niagara Escarpment contain predominantly field crops, fruit and vegetable production, livestock, and equestrian uses (particularly in Halton and Peel regions). In Grey County, orchards, vineyards, large livestock, and field crops predominate. In Bruce County, agricultural production is primarily related to large animal livestock (beef production), as well as foraging and field crops.

The nature and scale of agriculture in southern Ontario is changing due to urban pressures, changing demographics, and environmental and economic forces.

These changes include:

- A decline in the farmed area and number of farms, with average farm size increasing.
- A decline in farms specializing in large animal agriculture.



The multi-coloured male Wood Duck in Grindstone Creek wetland.

- An increase in the number of farms specializing in vegetable crops and horticulture.
- A high proportion of farmers over the age of 55 years, with a reduction in ability to transfer the farm to the next generation.
- Increased need to diversify farm operations through value-added production and/or additional on-farm uses.
- Increased uncertainty and competition due to international trade agreements, some of which are challenging conventional approaches, including supply management.
- The challenge of climate change (see section 4.5).

In order to have a viable agri-sector, the agricultural land base needs to be protected first and foremost. The Provincial Policy Statement and the four Greater Golden Horseshoe (GGH) land use plans permit a wide range of uses in prime agricultural areas which includes agricultural, agriculture-related uses, and on-farm diversified uses. This may result in new farm products or necessary and/or valued rural services.

These uses are necessary for a viable agri-food sector because, ideally, agriculture must be supported with processing facilities close to farms, and some types of

farming may be more viable if they are supplemented with additional sources of income, provided that they do not compromise the predominant agricultural use of the land. Striking a balance between good planning practice and economic development can be a challenge (2023-26 Commission Business Plan).

Please refer to 5.2 about trends in tourism, also an important sector of the Biosphere.

5.2 Describe the tourism industry in the Biosphere reserve. Has tourism increased or decreased since nomination or the last periodic review? What new projects or initiatives have been undertaken? What types of tourism activities? What effect have these activities had on the economy, ecology and society of the Biosphere reserve? Are there any studies that examine whether designation of the area as a Biosphere reserve has influenced the number of tourists? Please provide the bibliographic information of any studies and/or a paper copy in an annex.

The proximity of millions of people to the Biosphere (Refer to 5.1) results in a high demand for recreational opportunities and tourism. Also refer to 5.4 for information on tourism. The Bruce Trail provides public access along the entire length of the Escarpment through a network of 1,376 km of marked footpaths, 70% of which sit on

permanently protected lands. There are 163 parks and open spaces that run along the length of the Escarpment, as well as villages, hamlets, vineyards and ski resorts. Dozens of waterfalls, including Niagara Falls, lie on the Escarpment, as well as the headwaters of five major river systems. Tourism on the Escarpment contributes an estimated \$100 million annually to local economies. For example, in 2019-20, Bruce Peninsula National Park and Fathom Five National Marine Park near Tobermory had more than 762,000 visitors combined. (2022 Conserving the Niagara Escarpment - Auditor's Report)

Tourism is a significant economic activity in Ontario. In 2021, tourism contributed \$36.8 billion to the provincial GDP, and \$5.8 billion in tax revenue.

Within the NEP area, tourism is significant. For example:

- The Niagara Escarpment contains the most visited downhill ski centres in the province.
- The Bruce Trail attracts 400,000 visitors each year, contributing significantly to the local economies.
- Lands within the Niagara Escarpment Parks and Open Space System (NEPOSS) are major recreational destinations, providing natural heritage protection and public access to more than 44,000 hectares of Niagara Escarpment lands, including more than 890 km of the Bruce Trail, and over 400 km of associated side trails.
- Bruce County has identified that tourism is its largest economic sector, contributing significantly to sustaining tourism-related businesses. Several organizations offer ecotourism opportunities: EcoAdventures offer guided tours, [Cape Croker Park](#) offers Anishinaabe Cultural Experiences and [Grey Sauble Conservation](#) owns and manages over 80 properties that cover 11,734 hectares (28,995 acres) of land in the watershed. These areas are open to the public for certain permitted uses such as outdoor recreation.
- In the Niagara Region, vineyards, wineries, and tender fruit associated with the Niagara Escarpment sustain a growing agri-tourism sector. There is also increased bicycle tourism, including as part of winery exploration.
- In [Hamilton Halton Brant](#) Regional Tourism Association a number of initiatives have promoted nature appreciations

This increasing market for tourism and recreation is creating demand for the expansion and improvement of existing facilities, as well as new opportunities. Over the past few years, the Commission has observed an increase in

inquiries and proposals for destination and event-related tourism activities. For lands within NEPOSS, the balance between increased use/visitation and natural heritage protection will require careful planning in the coming years. (2023-26 Commission Business Plan)

Refer to 5.4 for additional information on the tourism sector of the Biosphere.

5.3 When applicable, describe other key sectors and uses such as agriculture, fishing, forestry. Have they increased or decreased since the nomination or the last periodic review? What kind of new projects or initiatives have been undertaken? What effect have they had on the economy and ecology of the Biosphere reserve, and on its biodiversity? Are there any studies that examine whether designation as a Biosphere reserve has influenced the frequency of its activities? If so, provide the bibliographic information of these studies and/or a paper copy in an annex.

In 2017, MNRF released a new study, [The Supply and Demand Study of Aggregate Resources Supplying the Greater Golden Horseshoe \(GGH\)](#), to update knowledge and information on aggregate resources in the GGH.

In the Executive Summary, the authors indicated that a material supply analysis was completed that involved an estimation of remaining reserves in quarries with Class A licences that were licensed after the preparation of the 2009 State of the Aggregate Resource in Ontario Study (SAROS) Report; an estimation of remaining reserves in selected licensed pits; and an identification and evaluation of unconstrained and unlicensed Aggregate Resources Inventory Paper Selected Bedrock Resources and Primary Sand and Gravel Resources.

The results of the study indicate remaining reserves of 545 million tonnes (MT) of bedrock in quarries that have been licensed since the 2009 SAROS Study or added to the Greater Golden Horseshoe (GGH) study area. The gain in estimated reserves as a result of new licences issued is offset by ongoing production of limestone from GGH quarries.

The study reviews a number of limiting considerations that cast significant doubt on the usefulness of relying on site plan volumes as an indication of available supply. While the study estimates potential remaining reserves of 2,792 MT might be available in 123 selected licensed pits there is quite a high degree of uncertainty associated with this estimate and the results should not be taken as a very realistic indication of what resource may actually be proven and made available from these licenced sites.



Each September 30, Niagara Parks turns Horseshoe Falls and Niagara Falls orange in recognition of Orange Shirt Day/National Truth and Reconciliation Day. The initiative was founded by Niagara Region's Indigenous Relations Advisor Brian Kon (Cree/Metis).

While potential reserves exist in many parts of the Province there are concerns about scarcity of certain products in close to market locations that will lead to increased costs and environmental impacts associated with increased haul distance.

Municipal and provincial infrastructure projects are major consumers of aggregate products. The Residential and Civil Construction Alliance of Ontario reports that municipal spending on infrastructure was in decline by 2020, although public and private infrastructure projects were an economic priority during COVID-19, and continue to be a priority entering the post-COVID economy. The provincial residential housing plan acknowledges the aggregate demand this initiative alone implies. In this context, it is likely that aggregate producers will continue to apply for expanded or new pits and quarries and NEP amendment applications for new or expanded pits and quarries are unlikely to decrease.

See information on the tourism industry included in 5.4.

5.4 How do economic activities in the Biosphere benefit local communities?

The rich diversity of the Niagara Escarpment Biosphere provides many economic benefits to local communities, including recreation and tourism, viticulture and farming, as well as cultural and culinary exploration.

Millions of people live in close proximity to the Niagara Escarpment Biosphere, resulting in substantial demand for recreation and tourism. The Escarpment's natural features, including watercourses, hiking trails, and ski hills, account for many of Ontario's outdoor recreational opportunities, drawing both local visitors and those from farther afield, and forming the basis of a thriving eco-tourism market. Hiking, caving, skiing, diving, mountain biking, and kayaking are a few of the recreational opportunities provided.

The Escarpment has 163 parks and open spaces, as well as numerous rural communities, vineyards, breweries, and ski resorts. In addition to Niagara Falls, dozens of waterfalls lie on the Escarpment. The Bruce Trail is a network of 1,376 km of marked footpaths, providing public access along the length of the Niagara Escarpment. Seventy percent of these paths are on permanently protected lands. There are approximately 36 golf courses and driving ranges, 22 campgrounds, and 10 ski resorts within the boundaries of the Biosphere.

The Biosphere provides significant economic value to the Province of Ontario. A recent study of Ontario's Greenbelt by the Green Infrastructure Ontario Coalition (GIO) suggests that the Greenbelt provides \$8.6 billion annually in gross output (revenues) to Ontario. The Niagara Escarpment encompasses twenty-three percent of the Greenbelt's total land area of 1.8 million hectares.

The Niagara Peninsula grows the largest amount of Ontario's tender fruit. This includes 94% of Ontario's grapes, supporting a vibrant viticulture economy. This region contributes a local agricultural economy of \$1.4 billion, which includes thousands of jobs and the production of food consumed all over the world.

The Escarpment's landscapes also provide agri-tourism opportunities through viticulture and mixed farming, which create local food specialties and culinary destinations along the various rural communities of the NE Biosphere. Niagara Region in particular has developed an extensive infrastructure of wineries, culinary festivals and events, and accommodations to bolster local economic development through tourism. Tourism spending in this region is over \$2 billion annually and contributes significantly to the local economies.

The Niagara Escarpment forms the geological and climatic foundation for Ontario's robust wine industry. Statistics from the Grape Growers of Ontario indicate that the Niagara Peninsula, i.e. the Niagara Escarpment, accounts for over 93% of Ontario's grape-growing volume. As a tourism destination, Niagara attracts over 13 million visitors annually; more than 2.6 million people visit the province's wineries each year.

In Ontario, 471 grape growers cultivate 18,000 acres of vineyards in Ontario in 2022. The 2022 harvest led to 46,056 tons of grapes, valued at \$62.4 million and \$103.7 million farmgate value (a reduction from the previous year due to inclement winter weather). With 185 wineries, the industry provides 22,385 winery jobs with \$1.2 billion wages and \$711.2 million revenue in 2022 (Grape Growers of Ontario 2023 Report). The wine industry also brings tourism with a \$1.04 billion economic impact, employing 5,888 people, and having 2.6 million tourists visit Ontario wineries in 2022. It is important to note that 58 wineries are located in the Niagara Escarpment area.

Numerous public events designed to promote the approximate 96 wineries of the Niagara Region are organized in an annual basis, including:

- Niagara Icewine Festival – an annual 9-day event held in January to unveil and showcase the previous harvest's Icewine.
- Niagara Grape & Wine Festival – held in September, this 9-day festival attracts more than 100,000 tourists who sample regional cuisine and fine wines, and enjoy world-class entertainment and family attractions. The Grape Growers of Ontario is a founding sponsor of this festival, which grows in popularity year after year.

Sustainable Winemaking Ontario and the Ontario Viticulture Sustainability Certification Program merged in 2021 to create one unified program: Sustainable Winegrowing Ontario (SWO) Certified. The SWO is an accredited certification program built around three core pillars of sustainability – environment, economy, and community. This all encompassing program, which received recognition from the Minister of the Environment's Award of Environmental Excellence, is the first of its kind in Canada, and it focuses on all aspects of wine production, from vineyard water usage to energy conservation, pesticide use, and community relations. The program goal is to encourage wineries to look at the impact of their day-to-day operations, in terms of environmental, economic, and social responsibility and SWO Certification reflects this commitment. Accreditation to this certification program is audited by an independent third party to maintain validity.

Many of the Niagara Escarpment's vineyards and wineries are exploring other innovative options, such as earning biodynamic and organic certification, constructing LEED-certified buildings, using geothermal or solar heating, and participating in Local Food Plus and other environmental programs.

An outstanding winery in the Biosphere that is leading efforts in sustainable practices is Featherstone Estate Winery, which utilizes grazing sheep to trim vineyard branches, and employs birds of prey as well for pest control. Featherstone Estate Winery was honored with a Niagara Escarpment Achievement Award in 2009 for its efforts in employing sustainable production methods.

The Ontario craft brewing industry has shown remarkable growth, from fewer than 40 breweries in 2009 to 340 breweries in 2022. This provides an economic impact of more than \$600 million annually, and supports over 11,000 employees. Over \$140 million of this annual economic activity occurs in rural communities. More than 5 million people visit Ontario craft breweries annually. The Biosphere is home to many brewing and distilling businesses contributing a significant amount to local economies.

Celebrating its 20th vintage in 2023, Hidden Bench is a premium artisanal winegrower that produces organic wines exclusively from its Pro-Cert certified organic estate vineyards on the Beamsville Bench. Kacaba vineyards and winery is located in the Niagara Escarpment buffer zone and promotes sustainable and vegan wine, winning the Silver medal for its Cabernet 2021 at the Canada Align. The reason for this dedication is that in 1997, Michael Kacaba launched Kacaba Vineyards, saving prime Benchland from

a developer's bulldozer. Today, Michael and his team craft a full range of wines, including their highly awarded estate grown Syrah (Ontario's oldest plantings). Their vision in conserving the escarpment is remarkable.

Spirit Tree Estate Cidery in Caledon leads sustainability efforts in their field. Awarded "Environmentalist of the Year" in 2010, this cidery utilizes straw bale construction and geothermal systems. The trees are maintained with Advanced Integrated Pest Management, allowing for wildflower growth to aid in soil erosion prevention and to supply their healthy bee hives for pollination.

There are a number of compatible "green" outdoor recreational experiences which take advantage of the Escarpment's varied landscapes and the iconic Bruce Trail. These activities, which are primarily focused in the Niagara Escarpment Parks and Open Space System include hiking, cycling, canoeing, kayaking, wildlife viewing, swimming, diving and snorkeling, fishing, hunting, camping, cross country/downhill skiing, snow shoeing, rock climbing, and golf. Ski and snowboard destinations are found throughout the Biosphere, and developments for ski hills and golf courses are often proposed by application.

The Bruce Trail Conservancy works to foster a safe and enjoyable experience for everyone who explores the Bruce Trail network. In each Club section, volunteers and staff support the improvement of infrastructure, such as bridges and boardwalks, and provide opportunities to marvel at the natural wonders found along the Trail. All of this is achieved using world class sustainable trail design with an eye to the future. The entire BTC community contributes in some way to this area of critical work. Member support enables the BTC to maintain trail blazes and signage.

Regional Tourism Promotion

The Biosphere covers 22 municipalities throughout the Province of Ontario, and many cross-municipal and regional tourism organizations have grown in the past decade, promoting the local culinary, recreational, heritage and natural features of the regions.

The most named tourism activity or destination in the Niagara Escarpment Biosphere was visiting Niagara to see Niagara Falls (17%), followed by hiking/walking trails (14%), parks or conservation areas (13%), trails in general (6%), campgrounds (4%), vineyards/farms (4%) and the Bruce Trail (3%). A total of 30% did not know.

Examples of Biosphere tourism initiatives and opportunities include:

- Niagara Escarpment Brewery Discovery Route – established in 2015 by the Green Belt Fund, a self-guided tour featuring some of Ontario's oldest craft beer and cider breweries, distilleries, local farmer's markets, local artisanal cheeses, and restaurants. Additionally supported by Grey County.
- The Niagara Escarpment contains the most visited downhill ski centres in Ontario.
- Visit Caledon – a regional hub for accommodations, small businesses, churches, heritage organizations, events, and restaurants promoting visitation to the central sector of the Escarpment in Dufferin County and Peel Region.
- Explore the Bruce – creators of the "Explore the Bruce Passport" trip planner to promote Niagara Escarpment features including scuba diving, trails, rock climbing and canoeing. The Bruce Trail attracts 400,000 visitors each year. This contributes significantly to local economies.
- Visit Grey – a local tourism initiative of the County of Grey promoting local events, Grey Roots Museum and Archives, and local food, including the popular "Apple Pie Trail," a themed travel route through the Escarpment's largest apple-producing microclimate region.
- Grey County - The Beaver Valley Sustainable Tourism Strategy and supporting action plan was developed to address the following objectives: Understanding the background and context surrounding tourism in the Beaver Valley Corridor; gathering insight, input, and feedback from a diversity of partners and stakeholders; identifying strengths, weaknesses, opportunities, and challenges for tourism in the Beaver Valley; co-creating a sustainable tourism strategy with a long-term vision for the Beaver Valley Corridor and confirming actions for the coming years.
- Tourism Hamilton – a prominent section of the local government of the City of Hamilton, the Escarpment's largest urban municipality, promoting the events and destinations of this Escarpment hub. Tourism Hamilton has successfully branded Hamilton as the "City of Waterfalls" for its 126 documented Escarpment waterfalls.
- Visit Niagara – connecting visitors with arts & cultural activities, day-trips and culinary/winery tourism in the southernmost sector of the Biosphere, the organization has branded Niagara Region as "Niagara Original", for its many local attractions.

- The Winona Peach Festival - an annual community festival celebrating local food and the arts in the Niagara Region.
- Discover the Bruce Peninsula – connecting visitors with accommodations, diving and snorkeling activities, parks, artisans, and local food in Tobermory and The Bruce Peninsula.

Escarpment Conservation Authorities work towards promoting awareness and tourism opportunities within their respective watersheds.

The Bruce Trail Conservancy maintains and promotes Canada’s longest and oldest marked footpath, of 1,376 km, located on the Niagara Escarpment. The Conservancy is one of Ontario’s largest land trusts and coordinates with nine Bruce Trail clubs for the upkeep, development, and protection of the trail.

The Twenty Valley Trail Revitalization Project is a new initiative by the Niagara Peninsula Conservation Authority and the Bruce Trail Conservancy. This project will expand the trail, to continue to promote tourism in the Twenty Mile Creek Watershed, with a focus on agri-tourism and eco-tourism of the valley system linking the Niagara Escarpment to Lake Ontario.

The Niagara Escarpment Biosphere Network’s Signage and Indigenous Leadership project aims to raise awareness in the Biosphere and Greenbelt by creating signages with QR codes. These QR codes, when scanned, will provide biodiversity and cultural information to educate visitors about the Biosphere, its biodiversity, and its ecosystem and cultural traditions.

Conservation Halton owns and manages approximately 4,450 hectares of conservation lands including six major parks primarily on the Niagara Escarpment.

The parks include spectacular natural features such as cliffs, waterfalls, lakes, forests, creeks and more than 100 km of trails for hiking, biking, nature appreciation and snowshoeing. More than 600,000 people visit the conservation areas annually:

- Kelso Conservation Area and Glen Eden Ski and Snowboard Centre - a popular ski and snowboarding destination for school groups with Halton Region Museum on-site offering public programs and exhibits on the area’s cultural history.
- Crawford Lake Iroquoian Village and Conservation Centre – the reconstructed 15th century Iroquoian village with longhouses, palisade, artifacts and exhibits, this

location is one of the most accurately dated precontact archaeological sites in Canada. Educational programs are offered year-round.

- Hilton Falls Conservation Area - this spectacular natural area with beautiful waterfall has ruins from three pioneer sawmills. The first mill was constructed by Edward Hilton in 1835 followed by mills built in 1856 and 1863. An interpretive viewing area allows visitors to see how early settlers were able to generate power from moving water.
- Rattlesnake Point Conservation Area – visitor centre and spectacular lookouts off the Escarpment’s dolostone cliffs; rock climbing and trails.
- Mount Nemo Conservation Area – visitor centre and walking trails and lookouts.

The Greenbelt Foundation has promoted the local food of the region, including the Niagara Escarpment, through grant programs to support local farmers, and promotional efforts to link food producers with urban vendors. Its “Friend of the Greenbelt” award honours individuals and groups for outstanding efforts to support the Greenbelt’s objectives, and 2021’s recipients include Conservation Ontario and Greenbelt Farmers’ Market Network. Both groups work extensively in the Niagara Escarpment Biosphere.

The Tobermory Maritime Association was formed to promote tourism and enhance scuba diving activities in the Tobermory area, highlighting the Niagara Escarpment’s underwater geological formations and historical shipwrecks.

Current plans include:

- Conceptual planning for future major dive site development.
- Discussions with Parks Canada regarding the establishment of additional dive sites within the Park.
- Interfacing with Parks Canada on issues such as the location of the Diver Registration Centre to ensure that the best interests of divers are served.
- Designing, placing and maintaining moorings at dive sites beyond the Fathom Five National Marine Park boundary.

In 2004, the Municipality of Northern Bruce Peninsula was designated as a Dark Sky community, and is one of the very last places in southern Ontario that still has dark skies. The Bruce Peninsula Biosphere Association and the Sources of

Knowledge Committee provided support for this project as part of their collaboration on a community-wide Dark Skies project.

One of the goals of the Bruce Peninsula Biosphere Association's "Dark Sky Demonstration Project" is to foster sustainable economic development. Bayside Astronomy is offered by the Bruce Peninsula Biosphere, together with the Bruce Peninsula Environmental Group and the Municipality of Northern Bruce. The program provides an opportunity to use telescopes to view and learn about constellations, planets, the moon, and other deep sky objects.

The Municipality of Grey Highlands came together with the Town of the Blue Mountains, the County of Grey, and the Regional Tourism Organization 7: BruceGreySimcoe in early 2023 to develop a 5-Year Sustainable Tourism Strategy and Action Plan for the Beaver Valley Corridor. This plan is in its draft stages, with an aim to create a long-term economic tourism plan that maintains social vibrancy and environmental sustainability.

The Town of Lincoln in the Niagara Escarpment has created the Lincoln Destination Tourism Strategy and Action Plan 2020 – 2025: Pathways to a Prosperous Tourism Sector. This report looks at strengths and opportunities to increase economic growth through tourism. Lincoln has installed oversized Big Benches, at various scenic locations, designed to entice and captivate visitors to the community.

5.5 How do you assess the effectiveness of actions or strategies applied? (Describe the methods, indicators).

See Section 4.4 for a description of NEP 2017 monitoring, and 2.3.9 for audits of the Commission related to effectiveness of the Commission in assessing whether it is meeting the objectives of the NEPDA and NEP.

In addition to the information in Section 4.4, 2.3.9, the Commission Business Plan 2023-26 includes a section on performance measures related to the delivery of their programs. They note that performance measures promote accountability and transparency of services. They also provide evidence that is used to recalibrate program delivery, enhance customer service, and identify program modifications/needs. The Commission's priorities for the next three years are to provide valuable and responsive clients services, support accountability and transparency, and be an inclusive organization where diversity and accessibility are fundamental values.

The Commission has established performance measures to help assess its success in achieving these priorities. By

monitoring performance, the Commission can evaluate the effectiveness of policies, quality standards and/or practices in meeting its goals.

The Commission has identified performance measures for 2023-26 which include administrative measures, customer service, compliance, and planning measures.

- Posting Memorandum of Understanding, Annual Business Plan and Annual Report
- Meetings of the Niagara Escarpment Commission
- Effective decision making
- Customer service
- Information provided to public related to the Niagara Escarpment program
- Development Permit Applications
- NEP Amendments
- Review of Applications under Planning Act
- Management of Compliance Issues

In addition to operational performance measures for program delivery, the NEP 2017 identifies that performance indicators will be developed and performance monitoring will be undertaken by the Province, in coordination with the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, and the Growth Plan for the Greater Golden Horseshoe, and in consultation with the Commission, municipalities, other public bodies and stakeholders, in order to demonstrate progress towards the implementation of the NEP policies. The Commission continues to engage with the MNRF Policy Division in the development of future performance indicators and monitoring.

As noted under the renewed Commission Operational Strategy, the development and implementation of a modern, digital-based model for receiving, processing, and issuing development permits and other program elements is key to the development of meaningful performance measures. It is expected that new performance measures will be identified and reported in association with the digital program implementation. Until then, the performance measures noted above continue to apply.

A number of municipal and agency partners also monitor the effectiveness of their conservation and sustainable development actions. Conservation Authorities are highlighted below.

All seven Conservation Authorities within the Biosphere conduct thorough watershed monitoring and evaluation programs. Watershed report cards are comprehensive assessments that provide a snapshot of the overall well-being of the watershed, evaluating environmental indicators. These report cards, initiated in 2007 and repeated every five years, cover various factors such as water quality, habitat health, biodiversity, and land use.

The grading system employed assigns scores to different indicators, facilitating clear communication of the watershed's health to the public and decision-makers. The indicators include water quality, habitat health, biodiversity, land use, and other relevant factors. The report cards help inform the public and stakeholders about the state of the watershed and the effectiveness of conservation efforts.

Key assessment indicators include surface and groundwater quality, forest health, wetland percentage, and impervious land use cover. Conservation Authorities monitor and map these indicators to report on watershed and water quality health.

The watershed report card monitoring assists in identifying issues, projecting future conditions, focusing natural resource management actions where needed most, and tracking progress over time. The common reporting metrics provided by watershed report cards enhance data comparability across regions, facilitating international collaboration and benchmarking.

Each Conservation Authority, such as Niagara Peninsula, Hamilton, Conservation Halton, Credit Valley, Toronto and Region, Nottawasaga Valley, and Grey Sauble, contributes to this collective effort, conducting monitoring programs and publishing report cards at regular intervals. These initiatives not only provide valuable data but also serve as models for other regions worldwide to improve their own watershed management strategies.

5.6 Community economic development initiatives. What programmes exist to promote comprehensive strategies for economic innovation, change, and adaptation within the Biosphere reserve, and to what extent are they implemented?

Organizations in the Biosphere actively participate in diverse programs and initiatives designed to harmonize conservation with sustainable development, social well-being, and community engagement. Economic development initiatives within the Biosphere cover a broad spectrum, aiming to foster awareness about the local environment, conservation, and sustainable living

practices. These initiatives encompass training sessions covering various skills, environmental education, and community outreach efforts.

In the realm of Sustainable Tourism Development, some Biospheres concentrate on cultivating sustainable tourism practices that positively impact local economies. This involves implementing training programs for individuals in the tourism industry, including guides, hospitality staff, and local artisans. To address social issues, Biosphere reserves may establish partnerships with local organizations, government agencies, and nonprofits. Collaborative efforts could extend to joint initiatives providing health services, social support, and skills training.

Research and Monitoring play a pivotal role in comprehending the social dynamics within and around the Biosphere. Research initiatives are conducted to investigate the effects of conservation efforts on local communities, social justice matters, and strategies to enhance overall well-being. Recognizing the significance of cultural heritage preservation, Biosphere reserves often initiate programs focused on documenting and promoting local traditions, languages, and practices that contribute to the holistic well-being of the community.

Refer to section 5.7. for further relevant information.

5.7 Local business or other economic development initiatives. Are there specific “green” alternatives being undertaken to address sustainability issues? What relationships (if any) are there among these different activities?

Economic development across the Niagara Escarpment Biosphere (Biosphere) is shaped by the region's diverse landscapes, natural resources, and cultural attractions. Some communities experience lifestyle shifts due to emerging economies, while others grapple with static populations, seeking ways to sustain local economies and cultures. Population growth in southern Ontario adds development pressures, emphasizing the need for construction materials, residential expansion, and recreational access.

Over the past decade, key economic sectors in the Biosphere, including sustainable resource use, mineral extraction, agro-tourism, local food production, and eco-tourism, have seen notable trends. The Greater Golden Horseshoe, a major economic hub encompassing parts of the Biosphere, is one of North America's fastest-growing regions, emphasizing sustainable practices, tourism, conservation, and community engagement in the Biosphere's economic development initiatives.



The views are amazing from the dolostone ledge along Skinner's Bluff, a long escarpment face that overlooks upland hardwood forest and the islands of Colpoy's Bay in the distance. The ledge was formed by the erosion of soft Queenston shale beneath hard Manitoulin dolomite.

Innovative approaches involve eco-tourism and outdoor recreational activities leveraging the Niagara Escarpment's natural beauty, such as hiking, cycling, bird watching, and nature-based experiences. The Bruce Trail, drawing 400,000 annual visitors, significantly contributes to local economies.

Support for local agriculture is evident through farm-to-table initiatives, farmers' markets, and agri-tourism, enhancing the local food economy and attracting culinary tourism enthusiasts. In the Niagara Region, agri-tourism thrives, particularly with vineyards, wineries, and tender fruit associated with the Biosphere, supporting bicycle tourism and farm-to-market culinary experiences.

The Biosphere leads in green technologies and sustainability, incorporating renewable energy, energy efficiency, waste reduction, and environmentally conscious practices. Incentives for sustainable construction and infrastructure underscore the commitment to minimizing environmental impact. Here are some selective examples of leading initiatives demonstrating new technologies.

District School Board of Niagara Walker Living Campus

Situated on the Niagara Escarpment near Niagara-on-the-Lake and St. Catharines, the Walker Living Campus at Woodend Conservation Area is a collaborative effort between the Niagara Peninsula Conservation Authority (NPCA) and the District School Board of Niagara (DSBN). Completed in 2014, it provides innovative nature-based activities for DSBN students, emphasizing exploration and independent outdoor play. With a focus on environmental studies, the center employs outdoor guides with relevant degrees. It is a product of DSBN's initiative to offer an advanced environmental and outdoor education experience for over 39,000 students. The designated Living Campus features revitalized facilities aiming to enhance outdoor experiences for all ages in the Niagara Region. The sustainable learning environment empowers students to connect with nature, employing non-traditional classrooms and sustainable building practices. Throughout the revitalization, the construction process itself served as a hands-on learning opportunity for DSBN students involved in the project. The new facility showcases various

energy-efficient design elements, including vegetative flat roofs, sloped white roofs to counter micro-climate/heat island effects, highly insulated pre-fabricated building components, locally-sourced cementitious materials, reduced site disturbance using the previous building's footprint, solar heat gain control through on-site building orientation, and landscaping with native species.

Joyce Centre for Partnership & Innovation

The Joyce Centre for Partnership & Innovation, situated adjacent to the Biosphere at Mohawk College in Hamilton, stands out for its sustainable features and cutting-edge design. This high-performance, green building serves as a hub for learning and collaboration.

Renowned for its sustainable design and construction, the Centre incorporates energy-efficient systems, green technologies, and eco-friendly materials, aligning with principles of sustainable development and green building practices. As Canada's largest net-zero energy institutional facility, it holds the distinction of being the first in the country to receive Zero Carbon Building – a Design and Performance certification from the Canada Green Building Council. This recognition establishes it as a focal point for carbon-neutral technologies and operations.

The L-shaped structure, with an investment of \$54 million and covering 96,000 square feet, includes lecture halls, classrooms, laboratories, a library, student collaboration rooms, and offices for the Centre for Climate Change Management at Mohawk. It actively contributes to the World Green Building Council's "Advancing Net Zero" initiative, which aims to achieve net-zero carbon for all buildings by 2050, with new buildings reaching this goal by 2030.

The Joyce Centre achieved its net-positive energy goal by generating 10% more energy than anticipated from its 550 kWp photovoltaic system. In 2019-2020, it produced 653,633 kWh, exceeding consumption by 40%. The energy budget target of 75 ekWh/m² surpassed typical buildings (230-300 ekWh/m²), achieving an impressive 73 ekWh/m² in the final model. In 2021, it produced 665,582 kWh and used 376,853 kWh, yielding a surplus of 288,729 kWh. The extreme hyper-efficiency was driven by establishing an energy budget at the project's outset, guiding design decisions without sacrificing the student experience. Environmental technologies include a high-performance building envelope, green roof, geothermal wells, a heat pump system, LED lighting, and efficient plumbing.

5.8 Describe the main changes (if there are any) in terms of cultural values (religious, historical, political, social, ethnological) and others, if possible with distinction between material and intangible heritage. (c.f. UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage 1972 and UNESCO Convention for the Safeguard of the Intangible Cultural Heritage 2003).

Since the last Periodic Review for the Niagara Escarpment Biosphere, significant changes have taken place both in terms of material heritage and intangible heritage. All along the Biosphere, development has been active with new buildings being constructed to facilitate business and economic growth and the provision of increased housing through condominiums and subdivisions to meet population growth challenges. These changes, that include human density increases, are impacting the visual and environmental character of the Biosphere.

As a result, there have been increased efforts in preserving and restoring historical sites, ecological restoration, creating new Indigenous cultural landmarks, and significant work being conducted by conservation groups to protect lands along the Niagara Escarpment. Growing environmental awareness and sustainability initiatives have influenced the way people perceive and interact with the natural and cultural aspects of the Niagara Escarpment Biosphere.

Particularly stimulated by COVID, nature trails have become in demand for healthy and relatively safe alternative destinations for those seeking exercise and mental relief. A great deal of change has taken place with the establishment of several Indigenous heritage destinations in the form of public artworks, parks, and healing gardens in the last 10 years. These include the Landscape of Nations Commemorative Memorial in Niagara-on-the-Lake (see 2.3.6 for further information), First Nations Peace Monument in Thorold (see 2.3.7 for more details), Awen' Gathering Place in Collingwood, and All Our Relations in Hamilton, along with several others that have come into existence within the past ten years.

The reintegration of local traditions, customs, and cultural practices are shaping intangible heritage all along the Niagara Escarpment Biosphere. For example, The Great Niagara Escarpment (TGNE) Indigenous Cultural Map provides a platform to facilitate education and awareness about Indigenous cultural landmarks (see 2.3.5 for more information). The reintegration of the cultural values has

a perceived impact upon cultural tourism and ecotourism that may influence intangible heritage by introducing new opportunities and interactions with local communities.

Efforts to involve local communities in heritage preservation and management have evolved, impacting the intangible heritage resources of the Niagara Escarpment Biosphere. The Woodland Cultural Center (WCC) located nearby to the Biosphere (just west of Hamilton) plays an important role in heritage preservation. The center is an Indigenous preservation museum and was established in October 1972, under the direction of the Association of Iroquois and Allied Indians upon the closure of the Mohawk Institute Residential School (MI). With over 50,000 artifacts in their Museum collection, the Centre is one of the largest facilities in Canada managed and administered by First Nations. The WCC serves to preserve, promote and strengthen Indigenous language, culture, art, and history, bringing the story of the Hodinohsho:ni people of the Eastern Woodlands to life through innovative exhibitions and programs. The WCC has promoted educational programs related to Indigenous Peoples of the Niagara region in the Biosphere. The WCC stands as a testament to the dedicated preservation of Indigenous heritage within the Biosphere, contributing significantly to the broader efforts of heritage conservation. As we delve into archaeological finds, it becomes evident that these

endeavors weave together a rich tapestry connecting the tangible and intangible aspects of the region's cultural legacy.

Archaeology of the Niagara Escarpment Biosphere

There have also been important archaeological finds over the last ten years that help to describe the cultural heritage of the Biosphere. As the most prominent bedrock feature shaping the physiography of southern Ontario, the Niagara Escarpment has influenced human land-use for millennia. Among the earliest evidence of this was found at the Mt. Albion West archaeological site, situated at the brow of the Escarpment in Hamilton, where stone tools and chert manufacturing debris documented a hunting camp dating to the end of the Pleistocene epoch ca. 13,000 years ago. Blood residue from one of the stone tools was identified as that of mammoth or mastodon, the first direct evidence of human hunting of extinct proboscideans in the Great Lakes area. The site was situated at the head of the Red Hill re-entrant valley where animals seeking to access the lands above the Escarpment would have been funnelled as they ascended the slope. The site also provided local access to one of several chert outcrops occurring along the Niagara Escarpment which Indigenous people sought out for the manufacture of chipped-stone tools. One particular source of white toolstone, Fossil Hill Formation chert



Volunteers and staff alike contribute to the work in Royal Botanical Gardens' herbarium, a collection of more than 60,000 dried plant specimens, including some extinct species from samples dating to the 1930's.

which outcrops near Collingwood, was highly prized by late Pleistocene hunters and tools of this age and material can be found hundreds of kilometres from the source throughout southern Ontario.

The Niagara Escarpment Biosphere encompasses thousands of archaeological sites that chronicle the history of Indigenous and settler residence in Ontario. The vast majority of these are yet to be documented, but one locality in particular has been studied repeatedly and recently received new attention. Crawford Lake is a unique meromictic lake situated a few hundred metres above the Escarpment near Milton. In the 1970s, maize pollen was recovered from varves in the lake dating prior to European contact. This led to the discovery of an Indigenous longhouse village nearby, now partially reconstructed and interpreted within the Crawford Lake Conservation Area. More recent analysis of the varves has shown how Indigenous farming in the fifteenth century and settler farming, beginning in the nineteenth century, are both recorded in the geochemistry of the lake's sediments. In 2023, Crawford Lake was nominated by an international team of scientists as the most suitable global marker site, or 'Golden Spike,' to define the start of a proposed new geological epoch, the Anthropocene.

These are but a couple of examples of the extraordinary archaeological and paleoecological record contained within the Niagara Escarpment Biosphere. Comprising both tangible and intangible elements, this legacy is of inestimable value to Indigenous and settler communities alike.

— Rob MacDonald

5.9 Community support facilities and services. What programmes in/for the Biosphere reserve address issues such as job preparation and skills training, health and social services, and social justice questions. What are the relationships among them and with community economic development?

Across its over 800 kilometers, there are many community support facilities and services within the Biosphere. There are three Regional Native Centres organizing programs to improve the social and economic conditions of Indigenous individuals and communities for enhanced overall welfare. There are four post-secondary colleges offering skills training essential for keeping communities competitive in a rapidly changing global economy. Each institution offers unique training programs that focus on emerging technologies and innovation, enabling communities to stay at the forefront of industry trends, fostering economic

resilience and sustainability. There are nine public health units providing a multitude of health and social services to contribute to community well-being.

The relationship between job preparation and skills training, health and social services, and social justice is often intertwined and mutually reinforcing with community economic development. Skills training programs often create networks and foster collaboration within communities. This social justice capital can lead to the sharing of resources, knowledge, and opportunities, promoting a collaborative environment that is conducive to economic development. Communities that support ongoing learning and skill-sharing are better positioned for sustainable growth. Skills training and education contributes to higher earning potential for individuals, leading to increased household income. As more community members acquire marketable skills, overall income levels rise, and poverty rates may decrease. This, in turn, contributes to improved economic conditions within the community. Table 5.9. provides a summary of community support facilities and services within the Biosphere.

Table 5.9. Community support facilities and services within the NEB.

Community Support Facility	Overview and Programs
Niagara Regional Native Centre	Promote awareness and mutual understanding between Indigenous peoples and the community, organizing programs to improve the social and economic conditions for enhanced overall welfare.
Hamilton Regional Indian Centre	Providing the Indigenous community with a place to gather, access services and participate in Cultural teachings and practices. Provides services in a culturally safe environment to help rebuild trust and provide a sense of belonging, fostering healing.
M'WIKwedong Native Cultural Centre	Established to meet the social, spiritual, mental, and physical needs of the urban Indigenous population. It provides a secure environment for Indigenous peoples to engage with their community and works to break down cultural and systemic service barriers between local Indigenous and non-Indigenous populations.
Six Nations Polytechnic College	Offers first-hand Indigenous knowledge, education, and skills training to everyone who is committed to learning. Offers students a supportive learning experience in a unique physical and cultural environment.
Niagara College	Offers more than 130 innovative programs where students can study abroad, pursue co-op placements, exchanges, and international field studies.
Mohawk College	Specialises in health science and engineering technology education and is the largest trainer of apprentices in Ontario.
Georgian College	Works with industry and community partners to offer relevant, cutting-edge curriculum, quality work placements and co-op experiences with top employers.
Tobermory Health Services Auxiliary	Healthcare provider contributing to community well-being of Bruce / Saugeen Peninsula.
Grey Bruce Public Health Services	Working with Grey Bruce communities to protect and promote health.
Collingwood Health Services	Collingwood Mental Health Services has been in operation since 1987 with a mandate to provide treatment from moderate to serious mental illness.
Headwater Health Care Centre	Orangeville and Area healthcare providers
Wellington-Dufferin-Guelph Public Health	Working with Wellington-Dufferin-Guelph communities to protect and promote health.
Georgetown - North Halton Mental Health Clinic	Working with North Halton communities to protect and promote health.
Halton Health Care Services	Working with Halton communities to protect and promote health.
Hamilton Health Sciences	Working with Hamilton communities to protect and promote health.
Niagara Health	Working with Niagara communities to protect and promote health.

5.10 What indicators are in place to assess the effectiveness of activities aiming to foster sustainable development? What have these indicators shown?

The NEP2017 is an environmental land use plan that has both a legislative and policy framework for the management of Niagara Escarpment to ensure sustainable development. Implementation of this plan upholds Biosphere principles by balancing protection, conservation and sustainable development to ensure that the Escarpment will remain substantially as a natural environment for future generations

In 2017 the province committed to develop performance indicators and performance monitoring to help evaluate the implementation of the NEP 2017. This would be done in coordination with the Greenbelt Plan, the ORMCP and the Growth Plan for the GGH. The process to develop these indicators should use the concept of Ethical Space and incorporate Two-eyed Seeing. To our knowledge this has not yet occurred. See 4.4 for a description of performance indicators and monitoring in the NEP 2017.

To ensure that the Escarpment's natural resources, ecosystem health and scenic landscape are protected, landowners are required to obtain a development permit for certain types of development within the Area of Development Control in the NEP 2017. An application for a development permit will be assessed to determine if the proposal is a "permitted use", if it meets the policies and development criteria of the Plan and whether other agencies are satisfied and support the application

If these conditions are met, a permit is issued, sometimes with terms and conditions to ensure development is implemented in a manner that minimizes impact to the Escarpment environment. The Commission annually tracks a number of indicators or measures related to development permits, including number of applications, distribution by municipality, type (e.g., residential, commercial, agricultures, extraction, etc), number approved, exempted, and appealed. Development permits may have conditions added to require the proponent to monitor and report on various environmental indices.

The Commission also tracks the number and type of applications for amendments of the NEP 2017 to allow certain activities not currently allowed by "permitted use", policy, land use designation or development criteria. This information is used to assess the effectiveness of policies and to provide evidence of the potential regulatory and

policy changes needed to ensue sustainable development occurs on the escarpment.

As noted in 2.2.5, according to the Audit, only 19 of 1,661 development permits were refused in the past five years, with some approved applications contradicting official plans. Moreover, the Audit revealed a lack of assessment of the cumulative effects of over 12,000 development permits since 1975. Despite resource challenges for monitoring the effectiveness of the plan in achieving sustainable development, acknowledgment of deficiencies allows for ongoing plans to address these issues.

The Commission also maintains a system to document and track compliance issues, including follow-up inspections, investigations, and other enforcement activities and results. This information is reported annually and is used to assess the efficiency and effectiveness of compliance operations and to provide evidence in the evaluation of potential regulatory and policy changes and, to adjust compliance operations as deemed appropriate.

Over the last several years, the Commission in delivering the Niagara Escarpment Plan program has undergone three independent reviews of its mandate, relevance, governance, value for money, sustainability, administrative efficiency and effectiveness. These reviews are detailed in 2.3.9.

All seven Conservation Authorities in the Biosphere have rigorous watershed monitoring and evaluation programs. Watershed report cards provide comprehensive assessments of environmental indicators that evaluate and communicate the health and condition of the watersheds, offering a snapshot of the watershed's overall well-being. The main purpose of these report cards is to inform the public, decision-makers, and stakeholders about the state of a watershed.

Indicators include water quality, habitat health, biodiversity, land use [development], and other relevant factors. Watershed report card monitoring helps to identify issues, project future conditions, and focus natural resource management actions where they are needed most, and track progress over time.

Community plans for sustainable tourism initiatives have been developed and their actions are being monitored for effectiveness. Refer to 4.3, 5.2, and 5.4 for more about these initiatives.

The Managed Forest Tax Incentive Program (MFTIP), facilitated by the MNRF, encourages good forest

management by giving a property tax reduction to eligible landowners who prepare and follow an approved Managed Forest Plan. The number of MFTIP plans and area coverage within the biosphere provides an indication of good forestry practices on private land.

5.11 What are the main factors that influenced (positively or negatively) the success of development efforts in the entire Biosphere reserve? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be most effective?

According to the Auditor General of Ontario, the Escarpment's natural environment is under threat. It is located beside the most densely populated part of Ontario, with 31 upper-, lower- and single-tier municipalities along the Escarpment including the cities of Hamilton and Owen Sound. Many First Nations and Métis communities, including the Saugeen Ojibway Nation and the Six Nations of the Grand River, also have traditional and ancestral territories along the Escarpment. Population pressures are mounting, with the number of people living in the Greater Golden Horseshoe expected to grow more than 50% to over 14 million by 2051.

The proximity of so many people results in a high demand for recreation and tourism on the Escarpment, putting pressure on its natural, and in some places delicate, environment. The COVID-19 pandemic underscored the importance of the Niagara Escarpment in providing access to recreational opportunities.

The Audit examined whether the Ministry and the Commission are effectively and efficiently conserving the Niagara Escarpment in order to meet the purpose and objectives of the Act and Plan. As part of the Audit, 64 (or 39%) of the 163 sites were visited in the Niagara Escarpment Parks and Open Space System—a provincially coordinated network of parks and open spaces for people to enjoy nature on and around the Escarpment. During these site visits, it was the work of many dedicated people and organizations, contributing to stewardship, recreation, education, and the conservation of the Escarpment was observed. The Audit also found that while the stewardship of the Ministry and the Commission has benefited the Escarpment over the years, those two entities are failing to fully provide the necessary leadership, resources and actions to maintain the Escarpment and adjacent lands as a continuous natural environment, and to ensure that all development is compatible with that environment. Meaningful conservation actions are necessary, as land-use

controls alone will not adequately protect the Escarpment.

Among the principal conclusions, it was found that the Commission no longer has a long-term strategic plan to fulfill the legislative mandate to conserve the Escarpment, nor are there sufficient performance measures and targets to evaluate whether the objectives of the Act and Plan are being achieved. The Ministry does not have a plan or program to assist in financing the completion of the Niagara Escarpment Parks and Open Space System and to secure a permanent route for the Bruce Trail, which runs along the length of the Escarpment.

The Ministry provides insufficient financial and staffing resources to the Commission to ensure that the Plan is effectively implemented. There is no longer any environmental monitoring because there are no staff, resources or programs to assess the state of the Escarpment. Moreover, reports of possible violations have significantly increased over the last five years, but no charges have been laid under the Act since 2014. Also, the Commission has approved almost all development permit applications in the last five years, while the Ministry has lowered the Plan's protections for endangered species. Species at risk include: the Jefferson salamander, rapids clubtail dragonfly, bobolink, wood turtle, American ginseng, and the cucumber tree.

The purpose of the Niagara Escarpment Planning and Development Act is to maintain the Niagara Escarpment and adjacent lands as a continuous natural environment, and to allow only compatible development. Good stewardship requires constant improvements to best address and adapt to rising pressures on the Escarpment, including from the significant population growth in the region.

While the Escarpment has benefitted from both the Act and the Plan in the almost half-century since its conservation was enshrined into law, the Audit found that both the Ministry's and Commission's systems and processes should be significantly improved. Among other things, it was recommended that the Commission develop a new long-term strategic plan in collaboration with the Ministry that outlines specific conservation actions that will be undertaken. that the Commission develop a performance measurement framework in collaboration with the Ministry that focuses on successful outcomes. Ontarians need to know how effectively the Province is safeguarding the Escarpment's valuable resources and how it plans to protect them in the future.



The elusive calypso orchid (rare in Ontario) is found under the cover of undisturbed forests. The name of this resplendent orchid, calypso, derives from Greek word for concealment.

The Ministry does not have a funding program dedicated to supporting the securement of lands to complete the Niagara Escarpment Parks and Open Space System and a permanent route for the Bruce Trail. It is obvious that the Commission does not have sufficient resources for environmental monitoring to assess the state of the Escarpment. Additionally, the Plan should include greater protections for endangered species' habitat, and prohibit new or expanded aggregate operations on the Escarpment. Protecting the habitat for plants, animals, and other life forms requires strong policies and implementation to build and maintain strong natural systems. Species within the Niagara Escarpment need help to survive.

Over one-third of species at risk in Ontario are contained within the Greenbelt, which includes the Niagara Escarpment. Intense development pressure in the Greenbelt is linked to this high concentration of species at risk. The overall health of the ecosystems in the area have been impacted by the conversion of natural and agricultural land to paved roads, aggregate pits and quarries, and housing developments. The overall impact is affected by the siting of developments. If developments are

not sited correctly, they can damage ecosystems and break connecting corridors in natural areas. Loss of connectivity between habitats, as well as pressures from nearby human activities, causes peril in species populations, affecting their ability to persist.

Further, the Commission requires additional financial and staffing resources to ensure the Plan is effectively and efficiently implemented.

The Ministry and the Commission have responded to all the findings with proposed actions to address the concerns raised including potential changes and additions to the NEP during the next review in 2027.

Many organizations, such as the Greenbelt Foundation, have analyzed the potential for communities across the Greenbelt and Biosphere to adapt to increasing development efforts in a sustainable manner. See research highlight below.

Assessing the potential for complete communities in the greenbelt amid development pressure

As described above, development efforts within the Biosphere are managed by the Commission, based on their approval of permits as required by legislated policy. The Biosphere and the Greenbelt regions are within one of the some of the most concentrated populations within southern Ontario. As the population continues to increase, there is a need for true sustainable development to match the rate of growth. A report recently written by the Greenbelt Foundation analyzed the current key steps of the challenges in creating complete communities as a solution to the growing concerns of rapidly increasing population and scattered development. Complete communities are defined as communities that offer a range of key services and infrastructure to meet the daily living needs of people throughout their lifetimes. The community is also attractive for businesses and employers. Complete communities provide a diverse age group of residents with differing levels of income, with easy access to housing options, transportation options, and public service facilities that enable the efficient use of existing services. This thereby protects the sustainability and long term needs of the natural features and productive farmland by preventing scattered development and further fragmentation of the surrounding natural land and ecosystems.

The purpose of this research was to determine and understand how the complete community concept could be applied to rural municipalities within the Greenbelt and Niagara Escarpment. The authors of this report defined rural municipalities as communities with populations between 1,000 to 29,999 and prime agricultural lands and natural features. The report examined and summarized a literature review, jurisdictional scan of policies and plans, and interviews with staff from rural municipalities across the Greenbelt and Niagara Escarpment. The report is broken into the seven components of a complete community: growth management, housing, public and active transportation, economic development, character, agriculture and environment and public consultation. Each of the seven components are assessed for the challenges and opportunities they present when transforming rural municipalities into complete communities.

This study identified that the primary challenges with accommodating and managing growth for rural municipalities within the Greenbelt and Biosphere were the

increased pressure on municipal resources and attaining a balanced public buy-in. Many of the interviews with municipal staff done during the research highlighted the concern for the municipalities' ability to adequately respond to increased population growth, specifically in regions where the amount of growth was not expected. There is also an associated cost of new or improved services that is a concern with the increased pressure on services and infrastructure. This study indicated that possible strategies to aid sustainable development that could be the most effective are growth management studies conducted by the municipalities, to understand the region's capacity to service growth and focus growth in areas with existing infrastructure that can be optimized to reduce the long term financial burden for the municipality. This report also identified the need to balance the wants of current and future residents in the community. Although municipalities often inform their residents of upcoming growth planning, there is a need to do true engagement and education with the community on any upcoming changes to population densities. This is an important aspect to effectively support new development efforts, and achieve greater acceptance and informed support for initiatives taken to accommodate growth. There is a need to continue to learn novel approaches and strategies for sustainable development within the Biosphere. The Network will continue to cultivate and strengthen networks of partners to discuss collaborative strategies and knowledge sharing.

6. THE LOGISTIC FUNCTION

6. THE LOGISTIC FUNCTION:

[This refers to programs that enhance the capacity of people and organizations in the Biosphere reserve to address both conservation and development issues for sustainable development as well as research, monitoring, demonstration projects and education needed to deal with the specific context and conditions of the Biosphere reserve.]

6.1 Describe the main institutions conducting research or monitoring in the Biosphere reserve, and their programmes. Comment on organizational changes (if any) in these institutions over the past ten years as they relate to their work in the Biosphere reserve.

During the time period 2019 – 2022, the Niagara Escarpment Biosphere administration and governance transitioned from the [Niagara Escarpment Commission](#) to the non-governmental organization, the Niagara Escarpment Biosphere Network (Network). The purpose of this transition was to better connect the Biosphere community. Since the 2022 incorporation of the Network, significant progress has been made to ensure the sustainability of the Biosphere. This included the reengagement with institutions and agencies conducting research and monitoring. In the spring of 2022, a formalized research network of the Network was established. The main institutions conducting research and/or monitoring in the Biosphere, their programmes, and partners are summarized in Table 6.1. below.

Table 6.1. The main institutions conducting research and/or monitoring in the Biosphere.

6.2 Summarize the main themes of research and monitoring undertaken over the past ten years and the area(s) in which they were undertaken in order to address specific questions related to Biosphere reserve management and for the implementation of the management plan (please refer to variables in Annex I). (For each specific topic provide reference citations. Provide the full citations alphabetically by lead author at the end of Section 6 or in a separate annex).

The Biosphere, known for its abundant biodiversity and unique geographical features, accommodates a wide range

of research and monitoring themes led by diverse agencies and individuals. These initiatives cover several areas, such as biodiversity, ecosystem well-being, sustainable development, invasive species, geomorphology, tourism, agri-food systems, education, pollinators, Haudenosaunee and Anishinaabek ethnobotany, and community involvement.

Refer to Table 4.2 (Main Conservation Partners and Programmes), Table 2.4.6. (Research Network Partners), Table 5.9. (Community Involvement), and Table 6.1. (Main Research Institutions and Programmes). Refer to Annex I for Research and Monitoring full citations alphabetically by lead author.

The Commission has hosted a biennial conference on the Niagara Escarpment Biosphere since 1994. As part of its role as a central convenor for the Niagara Escarpment Biosphere, the Commission has hosted 11 Leading Edge conferences since 1994.

The conferences bring together delegates from across Ontario and Canada, as well as guests from the U.S. and Europe, who discuss their work and experience in making the concept of the Biosphere work in practice.

The Leading Edge Conference series is a forum for researchers, policy makers, academics, consultants and the public to share their work on the Escarpment, and to network and pursue professional partnerships that can further their projects. In October 2013, the Commission presented the last Leading Edge series held in Milton, Ontario, with the support of partners, the Ontario Professional Planners Institute and Ontario Heritage Trust. It provided an opportunity to celebrate the past 40 years of the Niagara Escarpment Planning and Development Act (1973) and to look to the Niagara Escarpment's future as the Commission prepares for the 2015 Coordinated Plan Review. For this reason, the theme of the conference was "Renewal – Celebrating the past, planning for the future." Over 200 delegates attended including: provincial, federal and municipal government representatives; academia and students; planners and ecologists; landscape architects; agricultural groups; conservation authorities/agencies; tourism and development industry representatives; community groups/NGOs; and Biosphere representatives. It was an opportunity for networking and engaging in discussions on a range of topics related to the conservation, development, research monitoring and education activities in the Biosphere and the 2015 Coordinated Plan Review. The conference achieved the following positive outcomes:

Table 6.1. The main institutions conducting research and/ or monitoring in the NEB.

Research & Monitoring Program Area	Lead Organization	Partners
Great Niagara Escarpment Indigenous Cultural Map	Plenty Canada	Six Nations Polytechnic, Niagara Escarpment Commission, Guelph University, Brock University
Fisheries Coastal Waters Monitoring Program	Saugeen Ojibway Nation Environment Office, Chippewas of Nawash, Saugeen First Nation	Bagida-waad Alliance, Neyaashiinigmiing Source Water Protection, Nature Conservancy of Canada, Ontario Nature, Bruce Peninsula Biosphere Association, Lake Huron Coastal Centre, Parks Canada
Climate Research (specific to the NEB)	Bagida'waad Alliance	
Ecosystem services in biospheres – assessment and adaptation	Brock University	Department of Fisheries and Oceans, Grey Sauble Conservation
Biodiversity monitoring as a biosphere assessment tool	Brock University	CCUNESCO
Pollinator health in a restored NEB landfill	Brock University	Niagara Peninsula Conservation Authority, Niagara Region
Studying the Anthropocene at Crawford Lake	Brock University	McMaster, Carlton, Queens, University of Regina, Canadian Museum of Nature
Biosphere co-governance	Brock University, Plenty Canada	CCUNESCO, IUCN
Perception of nature and walk in the NEB	Brock University	
Bird Migration	Brock University, Niagara College	Bird Studies Canada, Niagara Falls Nature Club, Canadian Wildlife Services
Invasive species monitoring	Invasive Species Council	Ontario Phragmites Working Group, Niagara College,

		Bruce Trail Conservancy, MNRF, Parks Canada
Rock climbing impacts	University of Guelph, University of Toronto	MNRF, Ontario Rock Climbing Access Coalition
Managing for Ecosystem Resiliency	University of Waterloo	Parks Canada
Decision-making at the rural-urban fringe	University of Waterloo	
Effective Area-Based Conservation Measures	Canadian Biospheres Association	CCUNESCO, ECCC
Bald Eagle Ground Nesting	Natural Resource Solutions Inc.	Ontario Birds, Ontario Field Ornithologists,
Influence of vegetation on erosion	McMaster University	University of Guelph
Karst geomorphology	McMaster University	University of Guelph
Supporting Biocultural Diversity	CCUNESCO	Plenty Canada, University of Guelph
Forest health and climate change	University of Waterloo	
Rapid Ecological Restoration for Aggregate Sites	University of Waterloo	Ontario Aggregate Resources Corporation
Estimating Carbon Storage	University of Toronto	Ministry of Natural Resources and Forestry
Forest Vegetation Sampling Protocol	University of Toronto	University of Waterloo, Canadian Urban Forest Network
Validity of citizen science data sources	Redeemer University	University of Quebec
Ecological regime shift research	University of Toronto, Royal Botanical Gardens	Bay Area Restoration Council
Lichen biodiversity research	Canadian Museum of Nature	Stantec, SLR Consulting, University of Guelph
Tree planting	Bruce Trail Conservancy, Ontario Tree Atlas Project	Conservation Authorities, Restoration Councils, Land Care Niagara, Trout Unlimited Canada, Six Nations of the Grand River, Private Landowners
Wetland Restoration	Ducks Unlimited Canada	Conservation Authorities, Restoration Councils, Land Care Niagara, Trout Unlimited Canada, Private Landowners

GeoTrails program	McMaster University Bruce Trail Conservancy	Association of Professional Geoscientists Education Foundation, GEOScience, Western University
Watershed Report Cards	Conservation Ontario	Conservation Authorities
Land acquisition	Bruce Trail Conservancy, Nature Conservancy of Canada, Conservation Authorities, Niagara Escarpment Conservancy	Landowners
Bruce Trail Management	Bruce Trail Conservancy,	Bruce Trail Clubs, Conservation Authorities, landowners
Species at risk monitoring and recovery plans.	MNRF, MOECP	Niagara Parks Commission, Conservation Authorities, landowners
Survey on the importance of the Niagara Escarpment	Niagara Escarpment Corridor Alliance	Bruce Trail Beaver Valley Stewardship
Genetic seed diversity conservation	Carolinian Canada	Greenbelt Foundation, Canadian Wildlife Federation
Fundraising	Niagara Escarpment Foundation, Greenbelt Foundation	Network, landowners, Conservation Foundations, businesses

- Provide a forum to share research and projects that further understanding of Ontario’s Niagara Escarpment and the Biosphere;
- Provide a networking forum for delegates to share current and future project and discuss opportunities;
- Highlight sustainable development planning successes and challenges over the past 40 years; and,
- Provide a context in which to explore future opportunities related to sustainable development planning and conservation in preparation for the coordinated plan review.

6.3 Describe how traditional and local knowledge and knowledge from relating to management practices have been collected, synthesized and disseminated. Explain how such knowledge is being applied to new management practices, and how and if it has been integrated into training and educational programmes.

As mentioned through the document, the primary vision of the Network was derived from the shared perspective and need for greater collaboration and connection between all partners across the Biosphere. See [Principles of Engagement: Niagara Escarpment Biosphere Network](#) for the full Network vision statement. The Network is neither a governing body or decision-making authority in terms of land-use, management, or development. Rather, the Network emphasizes the need to amplify and listen to our

Indigenous partners’ voices and traditional knowledge, and follows the leadership on land management of the First Nations communities within our Biosphere. The Network continues to work to increase the capacity and knowledge of our partners for collaborative, Two-Eyed conservation work to be conducted in Ethical Space. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) The Network board continues to ensure that there is space and institutional capacity for traditional and local knowledge to be heard within all meetings and presentations, and that all future decisions, projects and conversations are always Two-Eyed. See 6.6.2 for more on the Network co-governance practices.

Indigenous communities and researchers within the Biosphere have conducted biodiversity and abundance research that can be used to guide present land management practices. The First Nations peoples in the Biosphere thoughtfully bring their traditional and local knowledge of the land, natural law, and reciprocity of nature to many tables, sharing and teaching how our lands need to be cared for (or some would say managed). The University of Guelph Masters of Conservation Leadership program for the last three years has run a residency within the Biosphere to showcase the Indigenous-led projects in the Niagara region. See 2.3.7 for more. Indigenous-led educational and training programmes are essential to the conservation of our Biosphere and the Network recognizes the paramount need to support and highlight these programs. See below for a snapshot of some of our partners’ work.



Photographer Mark Zelinski’s Niagara Escarpment Biosphere Network display at 2022 Sources of Knowledge Forum in Tobermory, shown here with fellow Network board member Victoria Serda, and Network co-chair Charlene Winger.

The Greenbelt Indigenous Botanical Survey and Field Guide - Wisdom from Knowledge

The Greenbelt Indigenous Botanical Survey and Field Guide project arose from years of community-based work and conversations on cultural resurgence, and the critical need for pedagogy that supports transmission of Indigenous Environmental Knowledges. The project stems from a primary Haudenosaunee philosophy and ethic that teaches about human responsibilities within the natural world: in order to be able to be caretakers of mother earth, human beings must be able to recognize, name and speak with all of the species and life forms, without which we would not exist. Acknowledging our relationality is a practice of gratitude that identifies interconnection and balance in creation. The wisdom to acknowledge this relationality is the dedication in the practice of the foundational environmental philosophy of the Haudenosaunee – The Words that Come Before All Else, also called the Thanksgiving Address, or Ohén:ton Karihwatéhkwén. Haudenosaunee culture-bearers teach that our responsibilities as humans are to return to this spiritual practice of gratitude every day, to communicate with Creation and identify how all of life is intricately connected and yet delicately balanced, to ground ourselves in the humility that we have everything that we need, if we but take the steps to implement care in our roles and responsibilities in creation. The Thanksgiving Address identifies all the entities in Creation that make life possible, from the Earth to the Sky – including the trees and plants, such as medicine plants and food plants.

Through research and professional work in Indigenous environmental conservation, education, restoration, and current conversations in Indigenous environmental studies, Dr. Jessica Dolan came to learn the need for culturally-grounded pedagogical resources for restoring Indigenous Knowledges of ethnobotany. The legacies of residential schooling, forced migration, urbanization, and the effects of acculturative policies on rural and urban Indigenous communities created inter-generational disruptions in transmission of traditional environmental knowledge. And yet, for the last 20 years, there has been an Indigenous resurgence across Turtle Island, wherein communities have been restoring all forms of knowledge, culture, governance, language, and kinship in their societies. In 2016, Tim Johnson and Larry McDermott of Plenty Canada, began to discuss with Jessica her idea to research and write a Haudenosaunee ethnobotanical field guide that would be an accessible, and culturally-grounded resource to support land-based learning programs, language programs, and

environmental governance that people were building across their communities. At the same time, Plenty Canada began creating The Great Niagara Escarpment Indigenous Cultural Map to reanimate Indigenous landscapes and stories along the UNESCO designated Niagara Escarpment Biosphere.

Beginning in 2020, Tim Johnson, Larry McDermott, and Jessica Dolan built a research team with Robin Roth, Faisal Moola, and Mia Yu Zhao Ni of University of Guelph, Tehahenteh Frank Miller and Alyssa General of Six Nations of the Grand River, and Brian Peltier of Wiikwemkoong Unceded Anishinaabek Territory to combine projects to create a digital cultural atlas and printed field guide that would recover and convey Haudenosaunee and Anishinaabek relationships with plants and trees on the landscapes of Southern Ontario.

The goals of this work is to teach what is learned in this research to: Haudenosaunee and Anishinaabek community members and educators, who are involved in language revitalization, environmental governance, protection and restoration, and education; policy makers, developers, environmental managers and conservationists throughout southern Ontario and beyond; and visitors to the Greenbelt trails who intend to use this Indigenous Botanical Survey to learn in place.

Our research of plant and tree relatives is shaped by cultural knowledge and responsibilities embedded in Haudenosaunee and Anishinaabek relationships with them. We are using western science in service of regenerating and restoring Indigenous environmental knowledge by investigating the legacies of Indigenous land management within the plant communities of the Greenbelt, and combining that with oral historical and ethnographic insights into cultural legacies of relationship with plants and trees. These choices serve our greater goals of creating publications that will serve Indigenous communities first, and the general public second. We aim to support Indigenous environmental departments to implement nation-to-nation environmental caretaking, conservation, education, co-governance, and treaty relationships with settler governments and citizens. We hope this project will help tell the story of enduring and beautiful Indigenous relationships with their homelands in southern Ontario, by educating the public about the timeless and living nature of Haudenosaunee and Anishinaabek relationships with plants and trees.

— Dr. Jessica Dolan

The Great Niagara Escarpment Indigenous Cultural Map

[The Great Niagara Escarpment Indigenous Cultural Map](#) serves as an extensive online archive spotlighting vital Indigenous historical, cultural, and natural landmarks spanning over 750 kilometers from Niagara Falls to the western perimeter of Manitoulin Island. Originating as a prototype developed during an initial seed-funded phase, this resource continuously grows, broadening its reach each year.

Presently operational, the platform offers limitless avenues for research and education, encompassing diverse Indigenous themes associated with the Niagara Escarpment. Spearheaded by Plenty Canada and the Commission, this remarkable initiative, furthered by Plenty Canada, was crafted in collaboration with the Canadian Commission for United Nations Educational, Scientific, and Cultural Organization (CCUNESCO). Its central objective was to explore effective engagement and integration of Indigenous perspectives within Biospheres across Canada. Despite being one of Ontario's four Biospheres, the Niagara Escarpment Biosphere, rich in traditional and historical Indigenous lands, has had limited efforts in integrating

Indigenous land-based knowledge, heritage sites, and biodiversity protection into pertinent organizational frameworks such as UNESCO, First Nations, municipal, and educational platforms.

Cultural mapping, employed by entities like UNESCO, utilizes diverse techniques to identify and illustrate tangible and intangible cultural assets within specific landscapes. Within the Niagara Escarpment context, Plenty Canada collaborated with Indigenous advisors and allies to document and safeguard significant Indigenous heritage resources. The interactive map of The Great Niagara Escarpment overlays Indigenous wisdom and narratives, reinstating Indigenous narratives on this age-old geological structure.

The influence of this culturally enriched map spans the Niagara Escarpment and World Biosphere network, offering benefits to educational institutions, natural resource management groups, and land management organizations within First Nations, provincial bodies like the Commission, municipalities, and global agencies entrusted with safeguarding crucial regions. Conceived and designed by Indigenous stakeholders, this endeavor holds potential for realizing Canada's Truth and Reconciliation Calls To Action.



During Niagara Children's Water Festival at Ball's Falls Conservation Area students learn about the many ways that water impacts the world around them.

With support from the Ontario Arts Council, Aboriginal Languages Initiative of the Aboriginal Peoples' Program of Canadian Heritage, Plenty Canada, and committed volunteers, this initiative has surpassed expectations, showing promise for extensive future research endeavors.

6.4 Environmental/sustainability education. Which are the main educational institutions (“formal” – schools, colleges, universities, and “informal” services for the general public) that are active in the Biosphere reserve? Describe their programmes, including special school or adult education programmes, as these contribute towards the functions of the Biosphere reserve. Comment on organizational changes (if any) in institutions and programmes that were identified in the Biosphere reserve ten or so years ago (e.g. closed down, redesigned, new initiatives). Refer to programmes and initiatives of UNESCO Associated Schools networks, UNESCO Chairs and Centers where applicable.

The Biosphere includes many organizations that engage in a variety of programs and initiatives that aim to balance conservation with sustainable development, social well-being, and community involvement. The Biosphere hosts a wide range of educational programs to raise awareness about the local environment, conservation, and sustainable living practices. There are four colleges and one university located in or immediately adjacent to the Biosphere. The following are the main post-secondary educational institutions that are active in the Biosphere.

Niagara College

Niagara College, partially within the Niagara Escarpment Biosphere, offers diverse diploma, certificate, and degree programs in business, health sciences, hospitality, technology, sustainability, media studies, and more. Renowned for applied learning, it emphasizes hands-on experience through co-op opportunities and internships, maintaining strong industry connections. The Office of Sustainability promotes sustainability initiatives and a sustainable culture on campus. Notably, in 2012, the college became one of the first in Canada to ban the sale of single-serve plastic water bottles.

Six Nations Polytechnic College

Six Nations Polytechnic (SNP) is an Indigenous-owned and governed post-secondary institution situated on the Six Nations of the Grand River Territory. It has a dedicated focus on incorporating Haudenosaunee culture, traditions, and languages into its educational programs.

Offering a diverse array of academic programs, including certificates, diplomas, and degrees, the institution places a strong emphasis on Indigenous Knowledge, languages, and cultural perspectives within its curriculum. SNP is steadfast in its commitment to preserving and promoting Indigenous languages and cultural practices, integrating traditional teachings to instill a sense of identity and pride among its students. The college's mandate of Indigenous sustainability emphasizes the perpetual use of Indigenous Knowledge, expressed through language, values, and actions, to harmoniously coexist with the natural world and maintain a healthy existence within a nation of diverse citizenship and needs.

Mohawk College

Mohawk College, with multiple campuses in Hamilton, features the Fennell Campus situated on the Niagara Escarpment adjacent to the Biosphere. Offering a diverse array of diploma, certificate, degree, and post-graduate programs spanning various disciplines such as health sciences, engineering technology, business, community services, and media studies, the college emphasizes sustainability in its academic curriculum. The Joyce Centre for Partnership & Innovation, a \$54-million, 96,000-square-foot facility, stands as Hamilton's inaugural zero-carbon institutional building, incorporating cutting-edge energy harvesting and conservation technologies and techniques.

Georgian College

Georgian College operates across seven campuses situated in Barrie, Orillia, Owen Sound, Midland, Muskoka (Bracebridge), Orangeville, and South Georgian Bay (Collingwood). Offering a diverse array of diploma, certificate, degree, and graduate certificate programs spanning health sciences, business, engineering technology, community services, hospitality, and more, the college is renowned for its focus on applied learning and practical skills development. As a leading postsecondary educational institution and responsible corporate citizen, Georgian College is dedicated to environmental sustainability, a commitment outlined in its 2016-2021 strategic plan. The college aims to enhance waste diversion rates and reduce emission production/carbon footprint, emphasizing a balance between future growth and environmental preservation.

Brock University

Brock University is situated in the Niagara Region, atop the Niagara Escarpment located completely within the

Biosphere. Brock is one of a handful of universities in the world located within a UNESCO Biosphere Region, an ecosystem that promotes the conservation of biodiversity through sustainable use. Brock University offers a wide range of undergraduate and graduate programs across various disciplines, including Humanities, Social Sciences, Business, Health Sciences, Education, Mathematics, Sciences, and the Arts. Brock University has received recognition for its academic programs, research endeavors, and commitment to sustainability. The university has also been acknowledged for fostering a positive and inclusive learning environment.

Brock powers its operations through a district energy plant utilizing cogeneration, a process that efficiently produces both heat and electricity. In an effort to enhance sustainability, the plant underwent upgrades in Fall 2016, replacing older engines with high-efficiency units. This initiative aims to supply 100% of Brock's energy, achieving a 20% increase in efficiency. Additionally, the upgrades resulted in significant reductions in nitrogen oxide and non-methane hydrocarbon emissions, addressing over 80% of Brock's greenhouse gas emissions.

Brock University also holds the UNESCO Chair on Community Sustainability: From Local to Global position.

The UNESCO Chair, led by Liette Vasseur, focuses on advancing sustainability science and its practical application in society. Vasseur's interdisciplinary research program explores issues like community-based ecosystem management, climate change adaptation, resilience, sustainable agriculture, and rural/coastal community well-being. Collaborating internationally, she works with Biosphere regions in Canada and Ecuador, contributing to academic discourse through publications and conferences. In education, Vasseur initiated the "Biodiversity in the Biosphere Reserve" field course in 2014, introducing undergraduates to biodiversity monitoring in the Niagara Escarpment. Her outreach efforts integrate conservation, ecosystem management, community engagement, and sustainable development. She plays a crucial role in the Niagara Escarpment Biosphere's Transitional Leadership Committee and founded the Network Research network in 2022. Vasseur's Biosphere involvement extends beyond her Chair position, including contributions to the development and review of various Biosphere regions. She authored a guide on assessing ecosystem services, presented internationally, and evaluated the Biosphere Reserves Institute in Germany in 2023. Internationally, she collaborates on research with the University of the Amazonian State, focusing on biodiversity conservation, sustainable development, and climate change, particularly



Niagara's Economic Development team photo, taken in 2022 by Mark Zelinski at Niagara Regional Headquarters in Thorold.

concerning Indigenous Peoples and Biosphere Reserves, resulting in publications.

Other environmental/sustainability education program within the Biosphere

Conservation as Reconciliation: Supporting the Transformation of Conservation in Canada

The Conservation through Reconciliation Partnership, led by Indigenous communities, aims to advance Indigenous-led conservation and Indigenous Protected and Conserved Areas (IPCAs) across Canada. The partnership, including Indigenous leadership, conservation agencies, academia, civil society, and communities, builds on recommendations from the Indigenous Circle of Experts report, “We Rise Together.” Co-hosted by the IISAAK OLAM Foundation, the Indigenous Leadership Initiative, and the University of Guelph, the partnership prioritizes Indigenous leadership and embraces Ethical Space and Two-Eyed Seeing principles. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) It focuses on creating lasting impacts through the IPCA Knowledge Basket, IPCA Innovation Centres, and IPCA Alliance/Network, supporting solidarity among Indigenous Peoples actively working on IPCAs.

Blue Mountain WILD School

Blue Mountain WILD School delivers outdoor education programs led by certified teachers for Kindergarten to Grade 8 students. Programs include full-time, Friday-only, after-school, and weekend options, focusing on outdoor skills such as bushcraft and paddleboarding. Additionally, they provide a summer day camp for ages 4 to 12 and specialized teen programs, like Junior Leader in Training and Leader in Training, emphasizing wilderness skills and teaching abilities. These experiences aim to enrich academic learning, foster personal growth, and cultivate environmental awareness within a natural setting.

St. Edmunds and Lion’s Head UNESCO Associated Public Schools

St. Edmunds and Lion’s Head Public Schools both received national UNESCO designation on June 2, 2008. This designation brings a significant responsibility to adhere to UNESCO’s four study themes. As part of the UNESCO Associated Schools Network (ASPnet), which includes over 12,000 schools in 182 countries, the school is committed to promoting peace, emphasizing UNESCO’s ideals such as rights and dignity, gender equality, social progress, freedom, justice, democracy, respect for diversity, and

international solidarity. The network focuses on three priorities – education for sustainable development, global citizenship education, and intercultural and heritage learning, operating at both international and national levels.

The designations were received as an outcome of years of support and want from students, staff, and community members. St. Edmond’s and Lion’s Head are educational institutions that emphasize learning based in the environment of the Biosphere for students from kindergarten through grade 12. The schools teach students about the importance of the balance between sustainable development and the protection of the natural environment through the framework of the Sustainable Development Goals (SDGs). Through the partnerships built with community organization, the schools prioritizes sustainable development and environmental stewardship in classroom projects and experiential educational field trips within the Biosphere and the Bruce Peninsula Biosphere. Table (6.4 A) exemplifies how the schools each use the SDGs as a framework for how the Biosphere supports the learning of the students and the goals of the shared UNESCO community.

Table 6.4 A. Educational programming at BPD as it relates to the SDG framework.

SDG	BPD Educational Programming
SDG 3: Good Health and Well-Being	Junior Trail Stewardship Program - an on-going partnership with the Peninsula Bruce Trail Club with students in grades 3,4,5,6, and 7.
	Specialist High Skills Major (SHSM) in Environment - a ministry approved specialized program for students to focus their learning on a specific career sector to assist their transition from secondary school to college, university or the workplace. Specific training and experiential learning in green industries, technology, geography, and environmental resource management.
	Footprints Conference - High school students invited to participate in the environmental conference.
	Envirothon - BPD annual participation in provincial competition where students are required to document specific sightings of native trees, birds, and mammals and provide a presentation on their findings.
SDG 6: Clean Water and Sanitation	Partnership with the Ontario Clean Water Agency to educate students on the importance of avoiding contamination of local fresh water sources and experiential educational trips to treatment plants in Lion's Head.
SDG 8: Decent Work and Economic Growth	Woven into the geography curriculum is the local importance of the tourism and agriculture sectors in the Saugeen Bruce Peninsula. In addition to emphasizing the importance of a sustainable community, showcasing methods to safeguard the natural environment while fostering economic growth.
SDG 9: Industry, Innovation and	Dark Skies Initiative - Discussions surrounding

Infrastructure	the dark skies initiative in the Saugeen Bruce Peninsula and impacts on birds.
SDG 11: Sustainable Cities and Communities	Woven into the grade 7,8, and 9 geography curriculum is analysis and reflections on sustainable development of local land through monitoring and land use planning by the Municipality of Northern Bruce Peninsula.
SDG 12: Responsible Consumption and Production	Compost and Recycling Programs within the school - Education to reduce the amount of waste heading to landfills.
SDG 13: Climate Action	Multiple litter pickups throughout the school year with participation from all grade levels.
SDG 14: Life Below Water	Mr. Seabin - partnership with Sources of Knowledge to teach students on and identify the types of waste collecting in local water sources.
	Ban on Single-Use Plastics - In 2017, in efforts to reduce waste to local landfills, BPDS decided to end single use plastics in the cafeteria.
SDG 15: Life on the Land	Tree Planting Initiatives - Multiple experiential learning trips and participation in tree planting with Bruce Trail Conservancy, Parks Canada and Nature Conservancy of Canada.
	Turtle Crossing - Through a partnership with Parks Canada, students assisted in creating a crossing at Dorcas Bay Rd and Cyprus Lake Rd.
SDG 17: Partnerships for the Goals	Participation in local community organizations's projects that promote environmental stewardship. Such as Keep the Bruce Clean and Green

The Bagida'waad Alliance

The Bagida'waad Alliance, under the leadership of Chippewas of Nawash Fishing Families, has operated as a registered not-for-profit corporation since 2018. The Alliance is actively engaged in documenting environmental changes by employing youth to interview community members, create mini-documentaries, and compile a book of stories. Additionally, the Alliance has initiated a Film School for Anishinaabek youth in the region, focusing on gathering narratives related to stewardship perspectives.

Woodland Cultural Center - Indigenous Preservation Museum

Established in October 1972, the Woodland Cultural Centre (WCC) emerged under the guidance of the Association of Iroquois and Allied Indians following the closure of the Mohawk Institute Residential School (MI). Initially focused on research, artifact collection, and library development, the WCC expanded to include arts in 1975 and a language program in 1984. Managing one of Canada's largest First Nations-administered facilities with over 50,000 artifacts, the Centre preserves and promotes Indigenous language, culture, art, and history. Through innovative exhibitions and programs, the WCC brings to life the story of the Hodinohsho:ni people of the Eastern Woodlands. As a hub of expertise and community connections, the WCC plays a vital role in education, language retention, and the renewal of artistic practices. The organization is dedicated to fostering understanding, engaging communities, and honoring Residential School survivors through accurate documentation and promotion of Indigenous values. The WCC is a premier destination for exploring, learning, and sharing the rich histories and contemporary cultures of Indigenous people in the Great Lakes region.

The Cootes to Escarpment EcoPark System

The Cootes to Escarpment EcoPark System represents a partnership among nine government and non-profit entities dedicated to preserving nearly 2,200 hectares of open space and nature sanctuary between Cootes Paradise Marsh, Hamilton Harbour, and the Niagara Escarpment.

Established in 2007, this collaborative park alliance allows participating agencies to individually own and manage their lands while working together on common goals. The partnership originated in 2006 through the Natural Heritage Planning Committee of the Bay Area Restoration Council.

Following extensive research and consultation, the first strategic plan, titled "Cootes to Escarpment Park System:

Conservation Land Management Strategy," was finalized in 2009 and received approval in principle from all participating boards and councils in 2010.

In 2013, nine land-owning agencies formalized the EcoPark System through a voluntary collaboration, operating under a three-year Memorandum of Understanding, which has been extended twice and is currently effective until 2026.

Acknowledging the rich history of First Nations and Métis people in Ontario, the participating agencies express respect for the Mississauga's of the Credit First Nation, the treaty and rights holder, and the Six Nations of the Grand River Territory. These lands represent the traditional territory of the Haudenosaunee, Anishinaabe, and Huron-Wendat nations.

Experiential Learning Pedagogical Approach to Education in the Biosphere

The vast richness in biodiversity, ecosystems, and geography of the Biosphere provides a landscape of educational opportunities for students and young people across the Biosphere. A core function of a Biosphere is a playground and classroom for all communities within it, further enhancing the relationships between people and their environments. Since its designation, the Biosphere has provided educational institutions with numerous opportunities for interdisciplinary approaches to teaching and research, and the landscape for time immemorial has been a giving teacher to the First Nations peoples across the region.

Due to the 725 km stretch of the Biosphere, there are many university and college campuses that fall within the Biosphere boundaries and thereby truly provide a learning place for sustainable development and biodiversity for land based education and experiential learning. Experiential learning is an important educational tool for many programs and universities across the Biosphere. Learning on the land and waters of the Biosphere provides students with hands-on experience and valuable connections with our environment. Experiential learning through classroom trips, co-ops, and field studies offer a critical vehicle of exploration into the surrounding environment outside the classroom. Recently many higher learning educational institutions within Canada have been urged to weave experiential learning into their curriculum, due to the significant advantages the approach provides in helping students to connect their learning to the outside world. The Network has recognized the importance and need to connect the researchers, knowledge holders and students who are actively involved in understanding and

working within the Biosphere and, through the creation of the research network, aims to connect partners together to create spaces of knowledge sharing and collaborative learning. See Table 2.4.6. for more details on the research network.

Field courses in the Biosphere serve as a prime illustration of experiential learning in the Biosphere. The University of Waterloo has been a consistent and committed partner to the Biosphere since its inception, and over the years have hosted numerous field courses on monitoring practices and ecology studies.

Spotlight on Experiential Learning in the Biosphere

University of Waterloo: ERS 283 Ontario Natural History: Species and Patterns

From 2018 and throughout the pandemic, the University of Waterloo offered a spring course on Ontario's natural history with a focus on first hand exploration of the biodiversity and native species in southern Ontario. The course offered an eight day field trip to the Bruce Peninsula Bird Observatory within the Biosphere providing students with a hands-on opportunity to explore the biodiversity hotspot and connect their learning on the natural history of the land. In addition, the students were provided with

an opportunity to conduct a field project while on site, contributing to building their skills in field studies.

University of Waterloo: ERS 382: Ecological Monitoring

Through the collaboration between University of Waterloo's School of Environment, Resources and Sustainability and the Commission, a course was developed with the aim of teaching various ecological monitoring methods. The course was designed as a field course to provide students with practical and theoretical knowledge of environmental monitoring in the Biosphere. As a result, the students of this course in the spring of 2018 and 2019, were able to provide the Commission with a substantial amount of valuable monitoring data on the health of the lands within the Biosphere.

University of Toronto's Master of Landscape Architecture: Hart House Studio; Perspectives from Students

University of Toronto's John H. Daniels faculty of Architecture, Landscape and Design recently developed an experiential learning and problem-based solving course through a partnership with the Master of Landscape Architecture program and Hart House Farms. The partnership was developed as a response to the



During a heavy rainfall, the elusive and endangered Jefferson salamander makes a quick midnight migration from its breeding pond of spring snow melt-water. This tiny traffic-stopper has been influential in halting a proposed highway and a mega-quarry near Mount Nemo.

call for action in the University of Toronto's Truth and Reconciliation pathway. The objective of the course focused its lens on the students creating design proposals and forest management plans for revitalizing Hart House Farms as a space for Indigenous-led and co-led land-based teaching, research, and community engaged programming. See 2.3.7 for more details on the cultural implications of this course.

Experiential courses that take place in the Biosphere such as this course have a significant impact on students. They aid in their learning, networking, and love of the natural environments of our Biosphere. To illustrate this significance, students Adrienne Mariano and Jessica Palmer, in the Master of Landscape Architecture program, shared their perspectives on participating in this course.

What did it mean for you to have this experiential learning on the land at Hart House Farms?

The opportunity for experiential learning meant that our conversations with treaty rights holders, organizations working in the region, and community members were able to be framed within the context of colonial land-based practices that were highly specific to observations on the property at Hart House Farm. Having the chance to frame these conversations with experiences such as walks, fieldwork, and even pond swimming meant that we were actively able to form deeper relationships with the land as we explored it from an academic lens.

What did it mean for you to work with all our studio contributors at the farm and throughout the term?

Getting all these people together for walks and presentations meant that they were also a part of this learning process, and were encouraged to reflect on how their ongoing work contributes to or works against decolonial land views and practices. Getting these conversations out of the classroom and into the world with working professionals was important because, as students, we often are encouraged to think as changemakers but it takes time to become established in our fields, whereas working professionals can make changes in more immediate ways.

What does it mean for you to have explored this site from a decolonial lens?

Exploring Hart House Farms from a decolonial lens allowed us to think more critically about landforms and how they are shaped on a time scale that is so large it is

almost incomprehensible to humans. This thinking helps to frame our relationship with the natural world and foster deep respect for the time it takes for cliff faces, rocks, and fossils to form. Comparing these ancient geological forms to the impacts caused by industrial quarrying in the region allowed us to question the impacts of ongoing extractive practices along the Niagara Escarpment and how the University of Toronto can use Hart House Farms to advocate for its protection.

What are you excited about / what do you hope to see in the near future, or in the long term?

In the near future, we hope to see the non-Indigenous partner organizations (especially those who work in conservation) work more actively to support Indigenous-led conservation practices and co-governance models. We are excited about the response from the team at Hart House and look forward to seeing how they incorporate and run with our research in making concrete changes at the property both immediately and in the long term.

6.5 How do you assess the effectiveness of actions or strategies applied? (Describe the methods, indicators).

The NEP2017 is an environmental land use plan that has both a legislative and policy framework for the management of Niagara Escarpment to ensure sustainable development, and promotes collaboration for research, monitoring and education.. See 4.4 for a description of performance indicators and monitoring described in the NEP 2017 some which may be related to the logistics function.

Over the last several years, the Commission in delivering the NEP program has undergone three independent reviews of its mandate, relevance, governance, value for money, sustainability, administrative efficiency and effectiveness. These reviews are detailed in 2.3.9.

In 2018-19, the Commission, in response to some of the findings of these reviews, developed a new Operational Strategy that focused on business and organizational effectiveness. It included a strategy to educate clients, regulatory partners, stakeholders, and Indigenous communities on the 2017 NEP and the Biosphere designation.

The Commission Business Plan 2023-26 includes a section on performance measures related to the delivery of their programs. They note that performance measures promote accountability and transparency of services. They also

provide evidence that is used to recalibrate program delivery, enhance customer service, and identify program modifications/needs. The Commission's priorities for the next three years are to provide valuable and responsive clients services, support accountability and transparency, and be an inclusive organization where diversity and accessibility are fundamental values.

The newly formed Research and Monitoring Network will develop metrics for evaluating its impact on research and monitoring in the Biosphere and align priorities with goals of the Network and frameworks such as the United Nations Sustainable Development Goals, the Statutory Framework of the World Congress of Biosphere Reserves, and the Truth and Reconciliation Commission of Canada's Calls to Action, all of which include education, research, and training metrics.

See Table 2.4.6 for an extensive list of partners that conduct research, monitoring and report on indicators. The Network might use the following indicators to measure success of its actions: use of Ethical Space and Two-eyed Seeing, increased research and education partnerships throughout the Biosphere, expansion of collaborative research projects, engagement and support of local community members and businesses.

The Network intends to develop a strategic plan that will guide actions for the next 10 years. This plan will include indicators for all functions of the biosphere, including the logistics function. The strategic plan will include priorities for outreach, communication, education, and training. Indicators of the effectiveness of these actions may include level of engagement and support from partners and community members (i.e., metrics to measure success of co-governance, Two-eyed Seeing, use of Ethical Space, number of volunteers, feedback from communities and local partners, social media metrics, number of presentations delivered, etc.). Regular assessment and adaptation of the plan will ensure its ongoing relevance and effectiveness.

6.5.1 Describe the Biosphere reserve's main internal and external communication mechanisms / systems.

The Commission, as convener of the Biosphere from 2012-2019, prepared and distributed newsletters about the work of the Biosphere and featured the Biosphere on its website. The Commission also sent communications regarding events and planning updates to the Biosphere network during that period. See Section 7.5.6 for a summary of those initiatives.

Since 2019, the newly formed Network has developed its own website and communication platforms:

info@nebnetwork.org – email

[NEBN Blog | Niagara Escarpment Biosphere Network](#)

[Niagara Escarpment Biosphere Network](#)

The Network's board communicates internally through emails, phone calls, and through the shared Google Drive system. Social media posts are made when the newsletter is released, which is released 2 times a year following the beginning of winter and spring. Our newsletters last year were released in August 2023 and March 2023, and whenever an event is to take place, like the Two-Eyed Seeing Ethical Space Training conference in March 2024. The newsletters consist of articles from our supporters, partners, and board members. We send out an invitation to our partners, and reach out through our networking, and even our partners networking, to establish a variety of articles related to the Niagara Escarpment Biosphere, as well as climate action. For events like conferences, posts are made weekly, either on Friday or Monday. For events, like an invitation to a talk being done, like Celebration of Nations, we send out posts starting the month prior to the event. Currently, since the creation of our Instagram account in July 2023, we have 102 followers. We have 1,089 subscribers to the newsletter. That number is the same for our blog. We currently have 32 followers and 27 likes on Facebook for the Network NEBN page. Our main communication in networking is the newsletter and the blog post, where we are getting more traction and interest.

6.5.2 Is there a Biosphere reserve website? If so, provide the link.

The link to the Network website follows:

[Niagara Escarpment Biosphere Network](#)

6.5.3 Is there an electronic newsletter? How often is it published? (provide the link, if applicable).

There is an electronic newsletter that is published twice a year with our networking partners. The newsletter articles and materials are available in the organization's blog at:

[NEBN Blog | Niagara Escarpment Biosphere Network](#)

6.5.4 Does the Biosphere reserve belong to a social network (Facebook, Twitter, etc.)? Provide the contact.

A Facebook page and an Instagram account for the Network were created and are as follows.

Facebook: <https://www.facebook.com/nebnetwork/>

Instagram: https://www.instagram.com/neb_network/

6.5.5 Are there any other internal communication systems? If so, describe them.

A Google Drive folder, set up and maintained by Plenty Canada communications staff, is used as the central location for the storage of shared documents pertaining to the Network, including important organizational documents, communications materials, meeting minutes, notes, contacts, funding agreement documents, board committee documents, etc., which are organized in a hierarchy of folders. The folder is owned by an account set up using the main Network communications email address (info@nebnetwork.org), so that the ownership and maintenance of the drive can eventually be handed to the Network when it becomes independent. The Network Google Drive is accessible to all members of the Network board, as well as the relevant Plenty Canada staff members who work on the operations of the Network.

The info@nebnetwork.org email is used as a hub to communicate between members and for external outreach specific to networking with municipalities and conservation authorities.

6.6 Describe how the Biosphere reserve currently contributes to the World Network of Biosphere Reserves and/or could do so in the future.

Highlights of how the Biosphere has contributed to the World Network of Biospheres over the last 10 years are:

- October 2013 - Leading Edge conference series held in Milton, Ontario, was presented by the Commission with the support of partners, the Ontario Professional Planners Institute and Ontario Heritage Trust.
- 2013 - Biosphere participated in the EuroMab Conference held in the Frontenac Arch Biosphere Reserve in Brockville, Ontario. Representatives from over 190 World Biosphere Reserves were in attendance. The theme of the conference was ‘Engaging our Communities’, and it provided an opportunity to strengthen relationships between experts and practitioners and share knowledge and practical ideas on implementing conservation and sustainability principles in Biosphere Reserves.
- February 2015 - Biosphere hosted a UNESCO-led workshop for a diverse cross section of Biosphere

organizations, representing a variety of interests to pilot a “Brand and Story” toolkit being developed by UNESCO-MAB. The outputs of the session will be used to inform communication strategies for the Biosphere and be a tool for other Biospheres to use to develop messaging for Biospheres in their regions.

- 2015 marked the 25-year milestone of the Biosphere as a UNESCO World Biosphere. The Biosphere strives to be an exemplary model of biodiversity conservation, sustainable development, and scientific research and outreach by connecting people to the benefits of nature every day.
- May 2015 - Commission staff were invited to attend the EuroMAB Conference, “Biosphere Reserves: from Heritage to Sustainable Innovation” held in Haapsalu, Estonia. Commission staff assisted in presenting the outcomes of the Biosphere experiences with the EuroMAB Brand and Story pilot project and to facilitate a workshop on the toolkit with other members of the EuroMAB network. This provided a unique opportunity to foster relationships with the national and international Biosphere community.
- November 2015 - the Biosphere was selected by the UNESCO Euro-MAB Committee to participate in a Brand and Story Toolkit Project, which aims to create a core brand for world Biospheres, that is simple, consistent, and powerful and to develop tools to assist individual Biospheres to communicate and market their Biosphere locally. The Biosphere was one of four pilot world Biosphere sites that participated in the international project. The Commission showcased the process used to develop the Biosphere’s new vision, “A place where people share a way of living with nature that builds a future we’re proud of,” at a number of events including: the Ontario Biodiversity Summit in Niagara Falls, the EuroMAB Conference in Estonia, and the 4th World Congress for Biosphere Reserves in Peru.

NOTE: UNESCO released the “The Opportunity - How can a common approach across the network help to engage people in Biosphere reserves?” by Brighton & Hove and Lewes Biosphere, UK in approximately 2018. The vision is “inspire a positive future by connecting people and nature today.”

- Global Partnerships: The Biosphere hosted delegates from China, Korea and a visit by Braulio Dias, Executive Secretary of the Convention on Biological Diversity

- (CBD) for the United Nations to discuss the benefits of Biosphere reserves.
- July 2015 - the Biosphere hosted delegates from Shenyang, China where they learned about biodiversity conservation and sustainable development in the Biosphere.
 - August 2015 - the Biosphere hosted Braulio Dias, Executive Secretary of the Convention on Biological Diversity (CBD) for the United Nations. The visit was an opportunity to discuss biodiversity in the Biosphere and the alignment of Biosphere objectives for biodiversity conservation with the CBD's Aichi targets.
 - October 2015 - the Commission provided a presentation on the Biosphere to ten delegates from Korea. The objective of the visit was to gain an understanding of the process that was undertaken in order for the Biosphere to obtain the UNESCO World Biosphere designation and the work required to maintain it. Representatives provided the delegates with a virtual tour of the Biosphere and shared best practices on biodiversity conservation and sustainable development.
 - March 2016 - Commission staff participated in the 4th World Congress of Biosphere Reserves in Lima, Peru. Staff were invited to share the outcomes of the Brand and Story pilot project and facilitated discussions with other global delegates on how Biospheres can effectively inspire and connect people with nature. This opportunity allowed the Biosphere to connect with delegates from over 120 nations on Biosphere topics and themes. Additionally, there was an opportunity to comment on the Lima Action Plan before it was endorsed by the Congress.
 - April 2016 - Commission staff participated in the 56th General Meeting of CCUNESCO in Winnipeg, Manitoba. The Commission continues to promote awareness of the NEP and the Biosphere at the local, national, and global level. The Network continued to participate in the General Meetings of CCUNESCO in Ottawa in February 2023 and in Quebec in November 2023.
 - June 2016 - Biosphere hosted a workshop with community partners to introduce the Amazing Places initiative of Canadian Biospheres to the Biosphere. This initiative is underway in other Biospheres across Canada and is focused on encouraging people to explore Ontario's Biospheres
 - October 2016 - Biosphere presented to a Chinese delegation on the Commission, Niagara Escarpment Plan, and the UNESCO World Biosphere Reserve status.
 - November 2016 - Biosphere participated on a panel of speakers at the Latornell conference to share the branding and toolkit.
 - February 2017 - Biosphere presented about the Biosphere and monitoring to University of Toronto forestry students.
 - 2016-17 - Biosphere focused on establishing a Biosphere network to foster more connection, collaboration, and synergy amongst Biosphere practitioners. The goal of the network will be to support the objectives of the UNESCO Man and the Biosphere (MAB) programme through the collective commitments and actions of the Biosphere network. To do this, representation would be needed from all of the identified communities for engagement, including Indigenous communities. Plenty Canada was contracted to develop and implement an engagement strategy to focus on tactics and approaches to encourage Indigenous participation in further Biosphere network initiatives. This strategy builds on work identified as a result of the EuroMAB 2013 conference at Frontenac Arch, the MAB Strategy 2015-2025, and resulting Lima Action Plan 2016-2025. "Working Together for a Better World - Engaging Indigenous Peoples in the Niagara Escarpment Biosphere Reserve - January 30, 2017" was a preliminary assessment of active and viable interest among geographically vested Indigenous Peoples and organizations invested in cross-cultural community activities (in relation to or of value to the Escarpment). Principals were identified to participate in the development of a Biosphere network.
 - 2017 - Commission Staff participated in a Board meeting of the Canadian Biosphere Reserves Association. Agenda items included updates on the Canada Man and the Biosphere (MAB) program, the periodic review process working group, Indigenous Working Group and communications.
 - 2017-18 - Biosphere participated in the planning and hosting of 2017 and 2018 Day on the Hill events in Ottawa, Ontario to raise awareness of the UNESCO Biosphere Reserve program among Canadian members of parliament.
 - 2017-19 - Commission continued to facilitate the development of improved governance options for the Biosphere over the long-term. The Commission, on behalf of the Biosphere, together with Plenty Canada,

a not-for-profit organization focused on promoting traditional Indigenous Knowledge systems, developed and delivered an outreach strategy to foster participation of Indigenous Peoples in the Biosphere. Indigenous outreach workshops were held on May 2, 2017 at Six Nations of the Grand River, and in Tobermory at the Bruce Peninsula National Park on June 27, 2017 in the territory of the Saugeen Ojibway Nation. The sessions were a positive first step in better understanding the value Indigenous people have in achieving the Biosphere objectives and are a first step in the process of recognizing our responsibility as a Biosphere to engage Indigenous communities meaningfully and to encourage and enable greater participation and input into the Biosphere. Refer to 2.1 for detail about the transition to a co-governance model for the Biosphere. This experience will be shared amongst other Biospheres.

- March 2022 - the Network officially became incorporated under provincial regulations. The Network is now the official entity that is working on the mandate and designation of the Niagara Escarpment Biosphere region. Through an agreement between the TLC and Plenty Canada, and with support from Environment and Climate Change Canada, work is underway to engage in a process consistent with recommendations from Pathway to Canada Target 1: by 2020, at least 17 percent of terrestrial area, and 10 percent of marine and coastal areas in Canada are conserved through networks of protected areas and other effective area-based measures.
- Network representation on the Canadian Biosphere Reserves Association (CBRA) Board of Directors, and engagement in national level projects (including participation in Environment Canada funded projects) will enable capacity building, and sharing lessons learned nationally and internationally from our path co-governance.

In addition to the above highlights, the Healing Places, described more fully in 2.3.6 and 2.3.7, provide cross-cultural lessons that are intergenerational, deal with several of the Sustainable Development Goals (SDGs), and are an excellent reflection of Ethical Space and Two-Eyed Seeing that are consistent with some of the standards in the UN Multilateral Environmental Agreements and the Lima Action Plan. Some of the Network board members work with community groups from Biosphere reserves in other countries. At the moment, the relationship is largely informal but discussions are being held to formalize those relationships. Ethical Space and Two-Eyed Seeing training that was held in 2024 can be applied to Biosphere reserves

in other countries. Refer to 2.3.5 for more information on this training initiative..

6.6.1 Describe any collaboration with existing Biosphere reserves at national, regional, and international levels, also within regional and bilateral agreements.

Biospheres were talked about in the Pathways 1 process, including transboundary cooperation with the US. Both Tim Johnson and Larry McDermott had meetings with Biosphere representatives from the Adirondack Champlain Biosphere.

Skaabawiis (Indigenous Circle for CBRA)

The Network’s administrative partner, Plenty Canada, has had experience collaborating with Biospheres across Canada through work with the Canadian Biosphere Reserves Association (CBRA). The [CBRA Indigenous Circle](#) (IC) was established through a special gathering of Indigenous Peoples whose traditional territories host Canada’s Biospheres, in February 2018. This gathering included Larry McDermott, Executive Director of Plenty Canada and current Network board member, and Tim Johnson, Plenty Canada Senior Advisor and current Network board member, both acting at the time as Biosphere delegates. The CBRA Indigenous Statement: “Making a Promise” was developed and declared, expressing the Indigenous delegates’ unanimous interest in being a part of the IC which would have “direct participation as partners in the processes, programming, and governance of the organization, and the resources required to ensure full participation, which includes planning, implementation, monitoring, and evaluation” (Indigenous Circle 2018). In fall 2018, the CBRA Board of Directors and the Indigenous Circle came together again and “working in Ethical Space, a collective vision was communicated—a vision with the intent to guide CBRA in its work to address national and global issues by supporting sustainable development, biodiversity conservation, climate change adaptation, and social justice (Canadian Biosphere Reserves Association 2018).

In early 2022, the IC agreed to collaborate with CBRA to deliver a 3-year project, titled “Supporting the Effort to Identify and Implement Measures to Count Biosphere Reserves Toward Canada Target 1 by 2025”, funded by Environment and Climate Change Canada (ECCC). The project involved updating CBRA’s governance model to be based in Ethical Space and to “be co-developed with Two-Eyed Seeing”, capacity-building training for the Biospheres, and developing strategies for resource

mobilization, funding, and biodiversity network knowledge transfer. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) The project work plan included the intent that “CBRA will support internal and external (BR) implementation of activities operationalized in Ethical Space through the Indigenous Circle’s hiring of an Indigenous position” (Canadian Biosphere Reserves Association 2022, 1). The work plan also included the following wording:

Throughout the project, CBRA will move forward in collaboration and partnership with the Indigenous Circle (IC) through a revised governance model and with a shared connection to biodiversity, operationalizing Ethical Space into its activities. Where the word “CBRA” is used hereafter, it is used with this team approach in mind. (Canadian Biosphere Reserves Association 2022, 2)

Between March–April 2022, (the “first year” of the project had a shortened timeline of two months, due to the agreement being made late in the fiscal year), the IC held several meetings among themselves and with members of the Executive Committee, in order to identify what would be needed to achieve the project work plan and to finalize a budget for the IC’s activities.

During this time, the IC initiated the process of this work through ceremony and spent a great deal of time and effort developing, discussing, and preparing for changes to the CBRA governance model, developing a background document on the fundamentals of Ethical Space, and building relationships, including engaging with Biospheres, to begin answering their questions about Ethical Space and Two-Eyed Seeing. During this period, the IC also created a working group for the project which was named Skaabawiis (‘workers’ in Anishinaabemowin), which would receive administrative support from Plenty Canada.

Unfortunately, starting in the second month of the project (April 2022), there was a lack of progress due to a lack of support, communication, and collaboration from the CBRA Executive Committee. Examples include making last-minute changes to the budget that had been outlined for the IC without any consultation or discussion, the withdrawal of funds that had been promised through written communication, Skaabawiis agenda items being deprioritized or ignored during joint meetings, questions and concerns being ignored (including discussion of an interim budget for Skaabawiis to have resources available to continue its work on deliverables during the second year [starting May 2022]—the eventual result of which was that the Skaabawiis never received any funds for its work

during the second fiscal year). Finally, the CBRA Executive Committee blocked Skaabawiis’ plans to hold an in-person meeting in the summer of 2022, when Skaabawiis had been very clear since the initial project discussions that there are needs in a co-governance relationship for ceremony, relationship-building, and face-to-face meetings to operationalize the collaboration, partnership, and cross-cultural governance in Ethical Space.

These issues, and the continued lack of support, communication, and collaboration from the CBRA Executive Committee, led the Skaabawiis to send three formal letters over the following months, outlining these issues and advocating for efforts to restore the original intent of the collaboration. The first letter was sent on June 10, 2022 to the CBRA Executive Committee. The response received on June 30 did not meaningfully address the contents of the letter. The second letter was sent on September 14, 2022 to the entire CBRA Board of Directors. An initial response was received on September 30 from Pam Shaw, the new chair of the executive committee. A second response was received on October 24 from the CBRA Board of Directors, which communicated that the board had decided to terminate the collaboration with Skaabawiis, and instead focus on a regional approach to reconciliation. The third letter was sent on November 18, 2022 to Eden Thurston (Manager, Protected Areas Partnerships and Operations) and Olaf Jensen (Director, Protected Areas) of ECCC. On December 2, Olaf Jensen replied, supporting CBRA’s decision.

Although the collaboration between Skaabawiis and CBRA collapsed, the Network is now guided by the spirit and original intent of Skaabawiis. And although Skaabawiis did not have the opportunity to deliver the planned capacity-building work for Canada’s Biospheres, the Network, through its administrative partner, Plenty Canada, is working to deliver the same type of capacity-building training (Ethical Space and Two-Eyed Seeing training) opportunities and working to make these training opportunities available to all Biospheres in Canada (in addition to the Network partners).

For other examples of the Biosphere’s work to collaborate amongst other Biospheres, refer to 6.4 for information on Brock University UNESCO Research Chair and 6.6 for other examples e.g., Amazing Places, Brand and Story Toolkit, Ethical Space Training, Day on the Hill, etc.

6.6.2 What are the current and expected benefits of international cooperation for the Biosphere reserve?

The Network stands as a demonstration site for co-governance as a Biosphere convenor. There is potential for future education and cooperation with all Biospheres within the World Network of Biosphere Reserves and the Canadian Biospheres Reserves Association. The significance of our co-governance system is described by four Network board members:

Charlene Winger - Jones - Co Chair of the Network

Two eyes are always better than one. We are the only Biosphere with a co-governance system, and other Biospheres are interested in learning from us and seeing how we work together. Charlene gets to speak as a First Nations person, as a woman, and as a co-chair, which is momentous. Charlene can talk about the water, our footsteps, ceremony, and share her Indigenous Knowledge while her co-chair can take on more of the administrative, procedural, and coordination aspects that he is familiar with. This approach allows for two different people with two different styles of working and thinking to come together for the Biosphere. This is a benefit to us all.

In the future, the Network will work towards producing and sharing informational handouts and resources on Indigenous traditions, like opening ceremonies. As we continue to engage with other Biospheres, we want to encourage gift-giving and exchange between groups. When we give away things we'll have more things come back to us - that's part of what co-governance is about. It opens up channels for better communication, introduces more people to each, and creates opportunities to learn from one another.

The Network is being watched to see how we handle things, how we communicate with each other, the ideas that form between two people, how we work with the board, and how similar ideas are expressed differently. Our co-governance system allows for learning and teaching with the whole board, other Biospheres, and everyone within the Biosphere.

Norman Ragetlie - Co Chair of the Network

The key value of international designation as a Biosphere region for us, in terms of the benefit it brings, is in reinforcing the awareness among Ontario stakeholders of the importance of biodiversity and habitat conservation, climate change, and sustainable development goals. It is the recognition that the unique character and natural environment of the Escarpment deserve special effort and attention. This special status can be both inspiring and motivational in terms of holding ourselves accountable

to achieve these goals. This was evident in the recent Auditor's General's Report on the Effectiveness of the Commission. Many recommendations were made about ways to improve that effectiveness, many of which called for the provision of adequate resources to accomplish the tasks it had been mandated to carry out.

In terms of what we might contribute internationally, Network believes it can become a model for co-governance and that we might share our learnings with other Biospheres. To the extent that we can respect and enact the United Nations Declaration on the Rights of Indigenous Peoples, which provides a framework for reconciliation, healing and peace, as well as harmonious and cooperative relations based on the principles of justice, democracy, respect for human rights, non-discrimination and good faith, we can become a good example of positive approaches that might be adapted elsewhere. This potential role we might play was recognized and encouraged by many of our Canadian counterparts at the National Gathering of the Canadian Biosphere Reserves Association in Quebec in November.

Victoria Serda - Secretary and Treasurer of Network

This co-governance system not only implements the Truth and Reconciliation Commission's recommendations, but actually takes these things a step forward because we're also implementing Ethical Space, Two-Eyed Seeing, and Ownership, Control, Access, and Possession (OCAP®) principles. We're trying our best to be non-extractive by not taking information from people without their understanding and agreeing on how it will be used, and trying to be fair about how we're going about things.

Along the Niagara Escarpment, many people don't understand treaties or reconciliation, or how to even walk down a path of reconciliation. They don't know how to set up meetings or develop relationships, and these are all important parts of co-governance. By operating through this co-governance system, we're trying to incorporate Indigenous Ways of Knowing and Being into what we're doing, such as having ceremonies or running meetings as a circle. Reverting to natural law, co-governance systems, and Indigenous laws helps us govern in a good way.

Co-governance means more than what most people think it does - people see Two-Eyed Seeing as two parallel paths rather than paths that can also be integrated or overlap. Co-governance allows for a true voice at the table and a just pathway for true reconciliation. It allows for Indigenous Knowledge and long-term understanding of the water, the land, the air, and the spirit to guide where things are going,



Cultural writer and smoke dancer, Chezney Martin of Seneca Turtle Clan performs a dawn dance. Sixty-seconds of the high-speed traditional smoke dance is considered an aerobic marathon.

while also allowing for non-Indigenous systems to operate. We need all parts of the medicine wheel and all the people from around the world to be acting in a good way. We hope to demonstrate to the world how strong we can be together to protect All Our Relations.

Larry McDermott - Board Member of Network

Through international cooperation, rights, and stakeholders can learn a great deal from international Biosphere examples around issues associated with the UN Multilateral Environmental Agreements, Indigenous perspectives on natural law, climate change adaptation, the built environment in alternative energy production, circular economics, water protection and management, and food production based on cultural and environmental values and principles. Indeed, much can be learned with respect to all the UN SDGs from one another through international cooperation.

6.6.3 How do you intend to contribute to the World Network of Biosphere Reserves in the future and to the Regional and Thematic Networks?

Refer to 2.1 for details on co-governance. Best practices around shared cross-cultural governance, climate change adaptation and mitigation, biodiversity protection, and

the SDGs must be shared to address the most important challenges facing humanity on the Earth today. Network members not only continue to contribute, but will expand our commitment to planetary, regional, and thematic processes that address the healthy continuation of all life.

6.7 What are the main factors that influenced (positively or negatively) the success of activities contributing to the logistic support function? Given the experiences and lessons learned in the past ten years, what new strategies or approaches will be favored as being most effective?

As previously mentioned, the principal challenge faced by the Network is the relative novelty of the organization. The Commission relinquished its role in 2019, rendering our organizational history only four years old, as opposed to a decade. For over two of those years, the process was overseen by a four-person Transitional Leadership Committee, temporarily reduced to three due to COVID. The advancement towards a co-governance model, orchestrated by a small group of unfunded volunteers, was impeded by the dual impact of COVID and the absence of dedicated resources, notably staff, hindering expedited organizational development.

In retrospect, it is evident that the Transitional Leadership Committee and the Network have been under-resourced for the broad communication and engagement process envisioned for their role and function. As a result, progress has been slow, and methodical but real. Much of the initial communications work was facilitated through student participation, either as part of class projects or internships. Establishing relationships with Indigenous and First Nations representatives, pivotal for structural considerations on engaging others, was deferred until a later stage due to COVID restrictions.

Strategically, the main factors that challenge the success of activities contributing to the logistic support function are organizational capacity, lack of recognition, absence of formalized structures for stakeholder engagement, and geographic disparities between southern and northern contexts.

As the Network continues to develop a strategic plan, it is a priority to address these core challenges systematically. The potential approaches to these challenges are:

a) Operational capacity: The Network and Plenty Canada have secured further funding from Environment and Climate Change Canada that will include staffing under the Network supervision for administrative support. The Network will continue ongoing efforts to secure funding that aligns with our strategic planning initiatives. We have targeted potential funding and are working towards developing a proposal to request transitional core funding for Network staff. A draft engagement framework currently in review by the board proposes a non-voting membership for both individuals and organizations who want to show support for the Network (this can begin providing a small but necessary source of revenues for overhead costs);

b) Recognition/awareness: Several initiatives could provide the springboard for increasing understanding of the Network role.

1. Annual conference to highlight and showcase effective stakeholder projects across the Escarpment. The conference could feature an awards program.

2. Establish the Network as the coordinating organization for multi-institutional participation in monitoring Escarpment sites for species at risk and biodiversity. To the extent that the Network research network is active and has data, the Network could seek funding for a periodic report card, “well-being” or state

of the environment report on the Escarpment. Initiate dialogue with the Commission to explore the possibility of ongoing funding for the Network to re-establish data collection and monitoring of the “ONE” sites for forest biodiversity and health in life science ANSIs.

c) Formal engagement/structure: A Strategic Planning process would help the board assess the potential likelihood of success for various models of engagement – e.g. local government or youth action advisory groups vs multi-sectoral roundtables organized on a geographic footing.

d) Geographic distance/asymmetry: The role of the Network and its strategy of engagement may need to be different in different areas along the Escarpment. For example, there are some regional groups such as Beaver Valley Sustainable Tourism and the Escarpment Corridor Alliance which are active in specific regional geographies and play some of the networking functions the Network might have but also have a discrete focus or purposes the Network would not have.

The challenges faced by the Network stem from its relatively recent establishment. Overcoming hurdles such as the impact of COVID and the absence of dedicated resources, including staff, has been a slow but steady process. The co-governance model has shaped our organization’s path and has established the Biosphere as a demonstration site for co-governance for all Biospheres. Looking ahead, the Network aims to fortify its foundation, seeking strategic partnerships and sustainable funding to support its continued growth and development.

7. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:

7. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:

[Biosphere reserve coordination/management coordinators/managers have to work within extensive overlays of government bodies, business enterprises, and a “civil society” mix of non-governmental organizations and community groups. These collectively constitute the structures of governance for the area of the Biosphere reserve. Success in carrying out the functions of a Biosphere reserve can be crucially dependent upon the collaborative arrangements that evolve with these organizations and actors. Key roles for those responsible for the Biosphere reserve coordination/management are to learn about the governance system they must work within and to explore ways to enhance its collective capacities for fulfilling the functions of the Biosphere reserve.]

7.1 What are the technical and logistical resources for the coordination of the Biosphere reserve?

Niagara Escarpment Biosphere Region Timelines:

Biosphere Management and Governance – a time of learning (1990 – 2012)

The Commission was the original Biosphere manager and oversight agency since the Biosphere designation in 1990.

Biospheres are nominated by the federal government of the country the site resides. The Niagara Escarpment Biosphere nomination was advanced to the Government of Canada by the Commission. The Commission is an agency established by the government of Ontario and is responsible for implementing the Niagara Escarpment Plan, which sets out policies and guidelines for land use and development within the Niagara Escarpment.

The Niagara Escarpment Biosphere boundary was overlain on top of the Commission planning area when nominated/designated and therefore follows the same boundary as the Commission planning area, extending 725 km from Niagara to Tobermory.

Biosphere Management and Governance – a time of reflection (2012 – 2019)

In 2012, the second Biosphere periodic review was conducted. The two main recommendations were to move the management and administration away from government oversight and transition to a not-for-profit governance structure to better achieve the goals and objectives of UNESCO Biospheres and improve Indigenous engagement and involvement in the Biosphere. The Commission agreed with this recommendation and the need to better connect community partners, especially Indigenous peoples and their invaluable conservation and traditional knowledge to help create a truly sustainable development model.

In early 2015, in the spirit of developing a new governance structure, under the hospice of Commission, partners and stakeholders along the Niagara Escarpment joined together to start brainstorming a better governance structure for the Niagara Escarpment Biosphere (Biosphere). The goal was to build a Network to promote respect, build new relationships, and embrace diverse ideas, knowledge, cultures, and experiences of all the Network members.

In June 2015, a Biosphere workshop was held with the goal of establishing a Network of members for the Biosphere. At this workshop, participants favoured a new Biosphere network which could also serve as a form of governance and administrative structure. Some of the attendees were invited to participate in a working group to draft a Terms of Reference for the Biosphere network with the Commission providing support and facilitation for the working group.

In January 2016, a Biosphere Working Group Terms of Reference was developed to define the goals, objectives, scope, and operational framework of the newly forming Biosphere “Network”. It reflected the feedback and outcomes provided by the participants of the June 2015 Biosphere workshops. In addition, to better promote the Biosphere, the Commission organized in June 2016, a meeting to present and discuss the possible promotion through the concept of Amazing Places. The Niagara Escarpment Biosphere was one of five Canadian Biospheres to assist in developing and conducting the Amazing Places project. The project successfully highlighted the nineteen stories from community members and organizations across the Niagara Escarpment Biosphere, exemplifying the strong connections between people and nature within our Biosphere. As well as providing opportunities for education on the ecosystems and geographical landscapes within our Biosphere in public locations.



Larry McDermott, executive director of Plenty Canada and Niagara Escarpment Biosphere Network board member speaks during a Network Board meeting at Lowville Park, July 2023.

In late 2016/early 2017, Plenty Canada, an Indigenous led Organization, was retained by the Commission to consult with the First Nations along the Biosphere and from there, develop recommendations for a possible Indigenous Peoples Engagement Strategy. Meetings were organized between April and July 2017 to provide an opportunity for the Biosphere to introduce itself and to invite Indigenous participation in the visioning and development of a renewed leadership model for the Biosphere that would be more firmly grounded in Biosphere communities. Meetings were held in Ohsweken, Six Nations of the Grand River and Tobermory, within the Saugeen Peninsula. Main participants were those who held positions of responsibility and who had an interest in the sustainability of the Biosphere's ecology. The consensus that emerged from those meetings supported Indigenous participation and recommended a "story-telling and mapping" project be the first action to begin restoring Indigenous knowledge and visibility back upon the lands of the Niagara Escarpment.

Following these meetings, a report was produced and submitted to the Commission. As the result of these meetings, Plenty Canada, under the guidance of their Artistic Director, Executive Director, a Senior Advisor, and dozens of Indigenous advisors, the Great Niagara

Escarpment Indigenous Cultural Mapping project began and was first presented in September 2019 at the Celebration of Nations in St Catharines.

In 2018, the Commission with financial support obtained from the Greenbelt Foundation and the Niagara Escarpment Foundation, retained Terrapin and Good Roots consulting to facilitate outreach in the Biosphere to get a better understanding of the needs and aspirations of Biosphere community members and their appetite for a newly reconstituted Biosphere governance structure. The project entailed providing the Commission with an environmental scan of strong governance structures and systems within Biospheres through the means of a literature search and interviews with six representatives from five distinct Biospheres across Canada who were regarded as having impactful governance characteristics to meaningfully engage with Indigenous communities within their respective Biospheres. The environmental scan established the need for a clearly defined vision, goals and objectives for the Biosphere that network and community members could understand and commit to. There was a strong need and want for a governance structure that was community-led. Three governance models were suggested as a result of this research. The suggested structures

were that a new incorporated, separate and independent, community-led non-profit corporation be formed, or the responsibility of the Biosphere be acquired by an existing related organization within the Biosphere who has the necessary capacity and strategic alignment to uphold and manage the Biosphere's designation, or an unincorporated and independent steering committee be formed with the Biosphere continuing to be a program of the Commission and the Commission continuing to be in a secretariat role. A situational analysis was also provided by interviewing 26 diverse partners and Indigenous rights holders. The situational analysis provided findings that validated the need for Indigenous leadership within the Biosphere. Many participants emphasized the need to make sincere efforts to engage with and understand the priorities of the Indigenous communities across the Biosphere. Following this finding, Anishinaabe Cultural Consultants were retained to prepare a guide and a road map on how to engage with First Nations in the Biosphere, a community information sheet of each of the Nations and traditional territories and/or Treaty lands within the Biosphere. As well, the work done by Plenty Canada was followed up, to further engage the Indigenous partners who were previously involved.

In July 2019, a workshop hosted by Terrapin / Good Roots consultants (attended by 32 individuals representing 28 Biosphere partner organizations), saw the renewal of a project started in 2015 (June 2015 workshop) to develop a more collaborative and community-driven leadership model for the Biosphere that is better equipped to coordinate and execute on-the-ground conservation efforts across the Niagara Escarpment. The idea of a transitional committee to help bridge between the Commission and a new Biosphere governance structure was developed. The strategic areas of focus of the transitional committee were to formalize a longer-term governance structure, overseeing not-for-profit incorporation, develop initial by-laws, establish programs consistent with the goals of the Lima Action Plan (2016), calls to action from the Truth and Reconciliation Commission (TRC) of Canada, initial oversight of the Biosphere's upcoming periodic review, and financial investment to support transitional and long term goals of the network.

The July 2019 workshop was followed by another in September 2019 with a consultant's presentation of the guiding principles established from the previous workshops. The goal of this workshop was to identify potential members of the to-be-formed Transitional Leadership Committee. An additional call for nominations can also be issued and the stating names were put to vote

and elections were completed in September. At this time five members were elected to the Transitional Leadership Committee and four working groups of governance, communications, program, and fundraising were established.

Biosphere Management and Governance – the current situation (2019 - 2023)

In October 2019, the first meeting of the newly formed Transitional Leadership Committee (TLC) took place. Members of the TLC were Liette Vasseur (Brock University), Patrick Robson (Niagara College), Victoria Serda (Bagida'waad Alliance), and Norman Ragetlie (Rural Ontario Institute) to define the main priorities and structure of the TLC, which included the need for more Indigenous engagement. A few more meetings occurred first in person and then online with the start of the COVID-19 pandemic.

Due to the pandemic, the work of the TLC slowed down considerably until December 2020. In April 2021, members of the TLC met with Larry McDermott and Tim Johnson from Plenty Canada to discuss the process and it was determined that an agreement of cooperation, which was signed in July 2021, was the appropriate course of action. Since then Biosphere started working as a co-management /co-governance organization.

In the fall of 2021 through the winter of 2022, the application for the Biosphere to become a not-for-profit Network organization at the Ontario level was prepared.

In March 2022, the Transition Leadership Committee completed its work with the launch of the Niagara Escarpment Biosphere Network (Network), which became officially incorporated under provincial regulations.

Since March of 2022, the Network has been the official governance and administrative body for the Niagara Escarpment Biosphere designation. Since then, the board developed committees and rightsholder/stakeholder groups that provide technical and logistical resources that assist in guiding the coordination and providing logistical support.

7.2 What is the overall framework for governance in the area of the Biosphere reserve? Identify the main components and their contributions to the Biosphere reserve.

The Biosphere strives to be an exemplary model site of excellence in the areas of sustainable development, scientific research, Indigenous reconciliation, and biodiversity conservation. The NEP is the foundation for



the Escarpment’s Biosphere reserve status; the Biosphere designation is aligned with the purpose and objectives of the NEP and the core responsibilities of the Commission.

The current governance framework of the Biosphere was developed after the last periodic review through engagement and consultations with the Indigenous and non-Indigenous communities of the Biosphere conducted by Commission, Plenty Canada, Terrapin and Good Roots. The primary aim of this engagement was to assess and inform how a collaborative, community-based governance model for the Biosphere could be established. A governance scan of “good governance frameworks” in Canadian Biospheres was conducted. Executive directors/general managers of several Biospheres were interviewed, including the Clayoquot Biosphere Trust, Fundy Biosphere, Georgian Bay Biosphere, Manicouagan-Uapishka Biosphere, and Redberry Lake Biosphere. A conclusion from these interviews was that the essential role for a Biosphere organization is to be the facilitator of collective action, fundraising and communication among network partners. The organization needs to be trusted and perceived to be an impartial, objective body. Specifically, there was a need to build relationships with Indigenous communities through an ongoing process built upon trust and reciprocity. The extent and nature of engagement by local First Nations in the governance and activities of the Biosphere must be defined by those communities themselves.

The Transitional Leadership Committee was created as a result of this consultation and members of this founding board went on to guide the formation of the Network. The Network, follows a co-governance structure, is co-chaired by an Indigenous board member and a non-Indigenous board member. The co-chairs govern as equals and act as a single voice of the Network to external partners such as CBRA, and attend events together, whenever possible. The Network is the only member of the Canadian Biosphere Reserves (Region) Association (CBRA) whose co-chairs hold a single vote. “Sustaining the Fire of the Network Together” (see Annex VII) are the guiding principles of the Network, utilized to ensure that the board is consistently operating from a core place of Ethical Space and Two-Eyed Seeing. The guiding principles outline the requirements of all board members to be fully committed to reconciliation and have the necessary training for creating a shared path. All board meetings are opened and closed in the power of ceremony through smudging or other suitable ceremony, and commit to a time of sharing, listening, dialogue and decision making. The board consists of a balance of Indigenous and non-Indigenous voices, with sincere efforts made to ensure that both the northern, central, and southern regions of the Biosphere are represented. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)



Franklyn McNaughton (Onandaga) at the historic site of the Niagara area Indian Council House, Niagara-On-The-Lake.

At the Annual General Meeting (AGM) in September 2023, the Network reviewed the recommendations of the Governance and Nominations Committee, and the following Standing Committees were approved, with Terms of Reference to be developed for each:

- Governance and Nominations
- Communications
- Finance & Grant Writing
- Research and Monitoring

In addition, the following Ad Hoc Committees were struck, with Terms of Reference to be developed:

- Periodic Review
- Book Tour and Biosphere Promotion

In September 2023, the Network board completed a review and revision of its by-laws. A minor amendment to the by-laws strengthened the structure of co-governance and ensured that co-chairs are identified in all references within Network governance documents. In the spirit of being the “network of networks”, board members are given the opportunity to immerse themselves in the beauty of the Biosphere and invite guests to meetings for sharing Biosphere experiences.

7.3 Describe social impact assessments or similar tools and guidelines used to support indigenous and local rights and cultural initiatives (e.g. CBD Akwé:Kon guidelines, Free, Prior, and Informed Consent Programme/policy, access and benefit sharing institutional arrangements, etc.).

Network Philosophy and oversight

As an organization the Network is guided by the principles of the Indigenous Peoples of the Biosphere, on how to create community, live in natural law and learn from the history of our land. As outlined in our guiding principles “Sustaining the Fire of the Network Together”, as an organization we are fully committed to reconciliation and doing the necessary training to create and walk a shared path. As stated in our vision statement, the belief of the Network is that “Though humans have caused a biodiversity and climate crisis, we believe that we have a responsibility, as well as the potential to make things better together and with equity — for the land, the air and the water, for all living beings, for all future generations — and to engage in co-development of these solutions with Indigenous Peoples throughout the Niagara Escarpment.”. See [Principles of Engagement: Niagara Escarpment Biosphere Network](#) for the Network Vision Statement. The

belief of the Network emphasizes the need for solutions to be co-developed with Indigenous Peoples, thereby strong participation by First Nations at the board and community level ensures the deliverance of this belief.

All of the organization’s guiding documents—“Sustaining the Fire of the Network Together”, Principles of Engagement/Vision Statement and future amendments to strategic plans - are rooted in aligning with the goals of Indigenous-led conversation frameworks and reports and with the UN’s Sustainable Development Goals. Similarly, the Network works to align with the goals of the Calls to Action of the Truth and Reconciliation Commission of Canada, the United Nations Declaration on the Rights of Indigenous Peoples, First Nations Principles of Ownership, Access, Control and Possession (OCAP®), and the One with Nature Report. Our organization’s vision works in the context of Canada’s Conservation Vision: A Report of the National Advisory Panel that “embraces Indigenous world views that acknowledge we are one species among many that share the Earth with the rest of life, achieves our collective conservation goals within a framework of reconciliation and the creation of Ethical Space, and affirms that a core strategy for conserving biological diversity is an interconnected network of protected areas and OECMs (Other Effective Area-Based Conservation Measures)”. Working in a path towards reconciliation and achievement of conserving biological diversity requires ethical sharing of knowledge and collaboration done in Ethical Space. The Network looks towards the examples of Indigenous-led projects done within the Biosphere for guidance on the methodologies, procedures and assessments of effectiveness of ethical sharing of knowledge and support to Indigenous-led initiatives. (See Section L and 2.3.5 for further details on Ethical Space.)

Indigenous Botanical Survey and Ethnobotanical Field Guide in the Greenbelt

The Indigenous Botanical Survey and Ethnobotanical Field Guide project undertaken by a collaboration of partners (See 2.3.7 for more details) is an exemplary initiative of knowledge sharing done in Ethical Space and Two-Eyed Seeing. A cross-cultural and intergenerational team was created to guide the project with the practical insights and needs of Mohawk and Anishinaabek environment departments, language and culture teachers. The team’s ultimate commitment was to create pedagogical materials that could be used to support Indigenous language, environmental caretaking, and land-based learning programs. These values were enacted through prioritizing accountability to Indigenous communities whose homeland

and cultures are being studied, by taking direction from Indigenous team members, intergenerational knowledge regeneration, data repatriation and reclamation. Similarly, the methods of this project prioritize horizontal leadership, generational and gender balance, and inclusivity of multiple experiential perspectives and revitalization of Kanyen'kéha and Anishinaabemowin language and plant names and science through the processes and contents of the publications.

Cultural Research Methods

The cultural and ethnobotanical research on this project are designed by incorporating methods from ethnobiology, Indigenous research in museums and archives, and applied Indigenous environmental studies. A baseline historical dataset was created from the archives of the Frederick Wilkerson Waugh collections at the Canada Museum of History. The archives provided an extensive look into Indigenous sciences and knowledge systems, and provided pressed plant leaves, and notes on the Indigenous languages of the Haudenosaunee, Anishinaabek, Innu, Inuit, and other Indigenous Peoples. Knowledge contained in Mr. Waugh's archive derives from the ancestors of current generations of people at Six Nations of the Grand River, Wiikwemkoong, and other First Nations, Métis, and Inuit communities. Indigenous colleagues advised the team on the kinds of cultural information that would be appropriate to research and include in the publications of this project. As part of our team value of cultural repatriation, the team sent copies of roughly 1,000 pages of digital files to several dozen colleagues who come from Haudenosaunee and Anishinaabek communities. This is their family knowledge that was disrupted and denied through Canadian and American acculturation and termination policies. These methods of sourcing historical information from archival ethnological records at colonial institutions, and reinterpreting them within contemporary contexts, to restore language and knowledge transmission are part of a growing field of Indigenous archival restorative research.

Metadata charts on Haudenosaunee and Anishinaabek ethnobotany were created to organize all the plant knowledge contained in the archival and published resources. With the data that demonstrate the knowledge transmission from over 100 years ago, and with Haudenosaunee and Anishinaabek knowledges side-by-side, this project uplifted and celebrated the similarities, differences, and richness of Indigenous living heritage on the landscapes in the Biosphere.

Indigenous Data Sovereignty doctoral student Marina Johnson-Zafirir, who is of the Wolf Clan from Akwesasne, describes data rematriation in our project as follows:

“Data reclamation is the process of turning to extracted knowledge within historic institutional archives and placing it back into Indigenous (in our case Haudenosaunee and Anishinaabek) orature in order allow these plant data facets to exist as living, breathing subject matters. This allows for the plant data to be storied rather than simply stored. The orature acts as the framework for our digital architectures. In our construction of the digital atlas and field guide, our Haudenosaunee and Anishinaabek partners have full access and regulatory stewardship of the ethnobotanical data that lives in these frameworks – promoting the self-determination and empowerment of Indigenous communities in the collection, management, and use of their own data.”

While carrying out the archival components of the ethnobotanical research, an Indigenous Advisory Team was built, who worked to identify the plant names in Kanyen'kéha (Mohawk language) and Anishinaabemowin; carefully consider the cultural verity, ethics, and appropriateness of the contents; shape the framework and orientation of the cultural components of the digital survey and printed field guide; and advised on uses of plants and trees. Together, a consistent orthography of those plant names was crafted and provided translations of those names into English. These translations often contained valuable information about the ecology and morphology of the plant or relationship between the people and the plant.

Biological Research Methods

Biological research and field survey methods on this project were built to create a survey of ethnobotanical plant communities to reflect phytosociological and biocultural understandings of plant ecology in the Greenbelt. Phytosociology is a western scientific field of study focused on classifying and explaining plant species occurrence over space and time. Because vegetation is so important to ecosystem structure and function, plant communities form the basic unit of many land classification systems employed in planning and resource management.

Extant plant communities reflect diverse processes such as disturbance history, environmental conditions, dispersal and inter- and intra-species interactions. Human activity is an important component of these above-mentioned processes, and reflects human relationships with plants. Indigenous Knowledge Systems embed understandings of plant community ecology as well as Indigenous land

management. Indigenous land management was formative for vegetation composition across North America. European colonization destabilized Indigenous Peoples' abilities to steward their homelands due to imposed colonial land management regimes such as logging, agricultural conversion and urbanization. Although this produced environmental changes that shifted vegetation compositions, legacies of Indigenous land management endure in Indigenous Knowledge Systems, and are still reflected in current vegetation composition on the landscapes of the Greenbelt and Biosphere, as elsewhere.

Phytosociological plant community surveys were conducted in areas of historic and contemporary significance to Indigenous Peoples in service of demonstrating the cultural knowledge of people-plant relationships within the Greenbelt and regenerating and restoring Indigenous environmental knowledge systems. A focus was placed on areas within the Greenbelt that are along historic Indigenous trails, which were complex systems of footpaths and waterways that facilitated movement, connectivity and livelihood, and were focal areas for Indigenous management of the landscape. Along these trails, sites of historic villages and resource gathering areas were located and areas of contemporary significance were identified by Indigenous teachers. In total, 69 plots were surveyed across 23 sites.

The field survey generated a list of 452 vascular plant species. Cross-referencing with the combined Haudenosaunee and Anishinaabek ethnobotany datasets, 233 species of ethnobotanical significance were identified and found within the landscapes of the Greenbelt. The results show the ethnobotanical significance of plant communities within the Greenbelt geographic range, but do not reflect all of the culturally significant plants in southern Ontario nor all of Haudenosaunee and Anishinaabek ethnobotany. However, the presence of 233 ethnobotanical species of historic and contemporary cultural importance does demonstrate the biocultural richness and dynamism of Haudenosaunee and Anishinaabek living relationships with plants and trees in the urban, peri-urban, and rural environments of the Greenbelt.

The results of this project were developed into a field guide outlining each of the plant profiles included in the Greenbelt Indigenous Botanical Survey including species names in Latin, English, Kanyen'kéha, and Anishinaabemowin, and translations of the Indigenous names into English. Profiles contain species description, habitat, conservation status, harvesting protocols, uses and stories. Botanical species are cross-referenced according

to plant types, ethnobotanical uses, and habitat types, so learners will be able to understand where to go to learn the plants, and the different kinds of vegetative communities they form. Botanical photography will help learners gain knowledge of defining characteristics of each species, and historical and contemporary photographs will provide learning aids for species' cultural significance.

7.4 What (if any) are the main conflicts relating to the Biosphere reserve and what solutions have been implemented?

Please refer to section 7.2 that describes recent positive developments in the Biosphere's governance structure.

7.4.1 Describe the main conflicts regarding access to, or the use of, resources in the area and the relevant timeframe. If the Biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone?

The Network's inaugural annual general meeting (AGM) in September 2023, provided a platform for partners and rights holders to express concerns related to the use of resources or access to resources within the Biosphere over the last ten years. Extensive and progressive conversations resulted among the participants, each recounting their own experiences, finding similarities and sharing solutions, and discussing the role of the network.

Common concerns raised by the participants included the increased pressure of development on the land, use of the land for mining and aggregates, and decreased resources for species at risk projects. Partners also recognized a significant increase in demand and use of trails and green spaces across the Biosphere after the COVID-19 pandemic, that have yet to be addressed to ensure the sustainable and conservation of the spaces. Decreasing funding sources and lack of access or capacity to acquire financial resources for combating issues such as species at risk or invasive species was also noted. This has resulted in increased competition for any available financial resources and with many partners creating similar smaller isolated projects to address these issues within their respective areas. It was concluded that the network could strengthen partnerships to create collaborative projects that could have a more expansive and meaningful impact. These conversations marked the beginning of an ongoing dialogue between all communities, partners, rightsholders, and governmental agencies within the Biosphere with the Network acting as the conduit for the networks to collaborate, engage and share. Partners agreed that by engaging in these



Situated on the Niagara Escarpment northwest of Collingwood, Blue Mountain Resort is the third-busiest ski resort in Canada. Its success has infused new life into the surrounding community, including the newly incorporated town of The Blue Mountains, and a new “village” similar to those built at Mount Tremblant and Whistler.

discussions, we begin to build the steps to increasing our collective capacity for sustaining the Biosphere and empowering each other to share knowledge and resources. See 7.5.6 for more on engaging the partners of the Biosphere at the Network AGM.

Highlight on Aggregates

As noted by the Network partners, aggregate supply remains a source of conflict within the Biosphere. According to the Commission 2023-26 Business Plan, aggregate supply is a key component of economic development in Ontario, required for constructing residential, commercial, and industrial buildings, and also supporting infrastructure such as transportation and utility corridors, water and wastewater systems, and for consumer and industrial uses. The 2010 Ontario State of Aggregate Resources Study indicated that over a 20-year span, Ontario consumed an average of 164 million tonnes of aggregate per year. Future consumption projections for the next 20 years average about 186 million tonnes (including recycling) per year, or 13 percent higher than in the previous 20 years. There are approximately 317 million tonnes of high-quality limestone/dolostone reserves close to the GTA market.

The Niagara Escarpment has historically been a prime aggregate resource location because of its proximity to the market and the high quality of its aggregate resources. As a result of extraction over the years, many of the existing

pits and quarries on the Escarpment are nearing depletion, and may either close and be rehabilitated or expanded to maintain operations. The impacts of expansion, or new operations, encompass surface and groundwater hydrology, natural and cultural heritage, scenic values, and an assortment of community interests. Alternative sources of aggregate resources are available elsewhere but may be at greater distances from their markets or may be available through subsurface mining.

Municipal and provincial infrastructure projects are major consumers of aggregate products. The Residential and Civil Construction Alliance of Ontario reports that municipal spending on infrastructure was in decline by 2020, although public and private infrastructure projects were an economic priority during COVID-19, and continue to be a priority entering the post-COVID economy. The provincial residential housing plan acknowledges the aggregate demand this initiative alone will create. In this context, it is likely that aggregate producers will continue to apply for expanded or new pits and quarries.

7.4.2 Describe any conflicts in competence among the different administrative authorities involved in the management of the area comprising the Biosphere reserve.

Transition from the Commission as convener to the Network has progressed over the last several years with the first workshop discussing the network being held in June



Grey County's first winery, Coffin Ridge, is located in spectacular proximity to Georgian Bay and the Niagara Escarpment near Meaford. Coffin Ridge produces high quality, small batch wine from hand-planted, hand-picked grapes.

2015 with over 40 Biosphere partners. Significant staff and consulting resources were spent in holding community workshops, developing a transition team and setting up the new non-profit. This recent formalization of the Network transpired at a time when the Biosphere periodic review was coming due and the impacts of COVID-19 on workplaces were continuing to unfold. In addition, the Commission workforce challenges (complete changeover of most staff since 2012) and increased workload have limited their ability to support the periodic review. It was noted in the Commission 2023-26 Business Plan that there is a need for organizational transformation to make the Commission's operations more efficient in terms of regulatory burden reduction and information management enhancements (i.e., database renewal, digitized regulation mapping, website improvements).

Implementation of the Commission's modernization efforts may assist the Commission in its goal to continue to provide support for Biosphere related functions and to share the considerable institutional knowledge that it has accrued throughout the decades.

In addition to the role of convenor, it should be noted that administrative authority of the Commission

in implementation of the NEP—the foundational management plan for the Biosphere—is significant. This authority is described in Section 7.4.3

7.4.3 Explain the means used to resolve these conflicts, and their effectiveness. Describe its composition and functioning, resolution on a case-by-case basis. Are there local mediators; if so, are they approved by the Biosphere reserve or by another authority?

The Commission was established in June 1973 as a regulatory agency that operates at arm's length from the provincial government, in accordance with the Niagara Escarpment Planning and Development Act (NEPDA), and the Ontario Government's Agencies and Appointments Directive.

The NEPDA established the planning framework for the Niagara Escarpment Plan (NEP), which the Commission administers by ensuring that development on the Niagara Escarpment meets the purpose and objectives of the NEP. The Commission also makes recommendations to the provincial government on NEP policies and amendments. The Commission reports to the Ontario Legislature through the Minister of Natural Resources and Forestry via a

Memorandum of Understanding (MOU). The NEPDA also identifies the composition of the Commission as consisting of 17 Commission members that are appointed by Order-in-Council. Nine members, including the Chair, represent the public at large, and eight municipally sponsored members represent the counties, cities, and regions within the NEP area. A current listing of [Commission members](#) can be found on the Commission website. The Commission meets regularly to consider certain development permit applications, land-use proposals, policy items, and NEP amendments.

Commission meetings are open to the public and can make a request for a delegation to speak to a matter before the Commission. The [Niagara Escarpment Commission Hybrid Commission Meetings Public Participation Guide](#) provides further information.

Under the Agencies and Appointments Directive, the Commissioners serve as regulators and make independent decisions related to the Act and Plan, but do not form a governing board.

The MOU recognizes the independence of the Commission in making regulatory decisions, but directs that the Commission must comply with the Act and make decisions that do not conflict with the Niagara Escarpment Plan. The Chair is accountable, through the Minister, to the Legislative Assembly in exercising the Commission's mandate.

The newly formed Network's board has a new "Niagara Escarpment Biosphere Network's Principles of Engagement, Dream and Vision Statement". Please refer to Section 2.3.5 for more details.

7.5 Updated information about the representation and consultation of local communities and their participation in the life of the Biosphere reserve:

7.5.1 Describe how local people (including women and indigenous people) are represented in the planning and management of the Biosphere reserve (e.g., assembly of representatives, consultation of associations, women's groups).

Background

There were some filters that were discussed before the election of members to the new Transitional Leadership Committee happened. The group wanted to elect diversity with different filters: geographical, engagement with Indigenous communities, and engagement with youth. The key parts of the recommendations from the last

periodic review were discussed as filters for how to elect members. These filters were reflected in the vote, as more women than men were elected, and people with extensive Indigenous engagement experience were also elected. (Three women and two men were elected—one of the women had to drop out early on due to a lack of resources to participate. She said her council didn't support her having this role and she couldn't take the time to do this role with no pay or travel compensation.)

In discussions around how co-governance should work for the organization, one of the ideas put forward was that there should be representation from both Six Nations and the Anishinaabek communities in the Saugeen Ojibway Nation, which was implemented.

The important thing for the Transitional Leadership Committee was to get Indigenous voices at the table to ensure proper co-governance. When Larry McDermott joined the board, he brought ceremony and the Ethical Space lens into the governance which has been very valuable. In addition, he is very knowledgeable on international governance. The only current Network board members located outside of the Biosphere are Larry, who has extensive Biosphere experience, and Josh, who is on Manitoulin Island (plans are underway to include Manitoulin Island in the Biosphere) and they are both Indigenous to their areas. Every other board member lives, works, plays, and actively spends time in the escarpment, which is significant. (See Section L and 2.3.5 for further details on Ethical Space.)

Current Representation

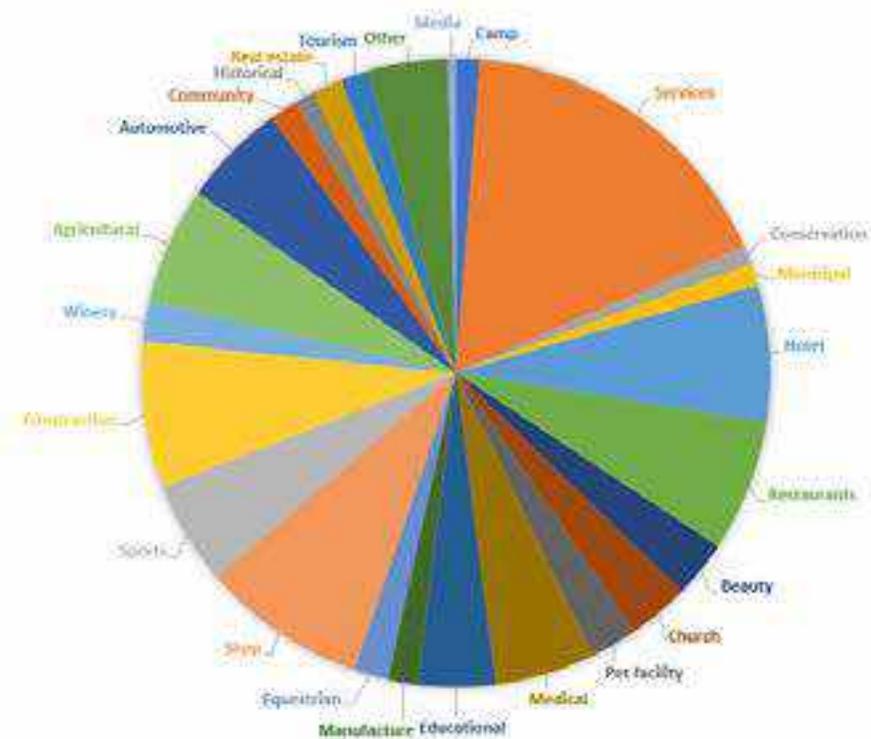
The current state of representation of local people, including women and Indigenous people, in the planning and management of the Niagara Escarpment Biosphere strives to include local communities in the Biosphere planning and management processes.

The Biosphere prioritizes community engagement and encourages active participation in decision-making processes. This has involved public meetings, engagement surveys, events, contributing to newsletters, and other community events.

Efforts have been made to include a diverse range of partners including women, youth, and Indigenous people, in discussions and decision-making forums to ensure various perspectives are considered.

Over the past several years a robust contact list of partners has been collected with over 2000 contacts along the Biosphere included. Refer to Table 7.5.1 and Graph 7.5.1.

NEBN PARTNER CONTACTS %



Category	Quantity	%
Camp	27	1.23
Services	376	17.18
Conservation	21	0.96
Municipal	25	1.14
Hotel	153	6.99
Restaurants	149	6.81
Beauty	64	2.93
Church	69	3.15
Pet facility	53	2.42
Medical	113	5.16
Educational	87	3.98
Manufacture	33	1.51
Equestrian	39	1.78
Shop	186	8.50
Sports	116	5.30
Construction	165	7.54
Winery	45	2.06
Agricultural	132	6.03
Automotive	117	5.35
Community	31	1.42
Historical	23	1.05
Real estate	34	1.55
Tourism	31	1.42
Other	90	4.11
Media	9	0.41
TOTAL	2188	

Refer to section 2.4.4 for a description of women’s representation and involvement in the planning and management of the Biosphere.

Currently, there are 5 Indigenous board members. There are training activities on Two-Eyed Seeing and Ethical Space that will include significant representation by youth and women. The Network will continue to provide opportunities for everyone in the vast territory of the Network to contribute to the success of the Network in reaching its goals and objectives. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) See below a brief summary of the Indigenous communities within the Niagara Escarpment Biosphere:

Saugeen Ojibway Nation (Saugeen and Nawash)

The Saugeen Anishinaabek have lived on and near the Bruce Peninsula for as long as their history remembers. Saugeen Ojibway Nation is the name used by the two independent member communities, Chippewas of Saugeen (Saugeen First Nation) and Chippewas of Nawash Unceded First Nation, when they work together as a collective. The Saugeen Ojibway Nation is represented by a joint council working together on issues affecting the larger territory.

These two individual member communities were once part of a vastly larger traditional territory. This traditional territory (See Figure 7.5.1 A) included the modern Bruce Peninsula (known by the Ojibway as the Saugeen Peninsula), all of the Saugeen River watershed, and extended from Tobermory, to Meaford, Goderich, Arthur, Cape Croker, Owen Sound, Collingwood, and Orangeville.

Saugeen First Nation

Also known as Chippewas of Saugeen, Saugeen First Nation is an Ojibway (Anishinaabe) First Nation located on the shores of Lake Huron, between Southampton and Sauble Beach. The Chippewas of Saugeen includes peoples living in Chippewa Hill, French Bay, Scotch Settlement, and Chief’s Point.

The band role population of Saugeen First Nation is over 1900, with a population of 810 living on reserve. The main reserve (Saugeen 29) is approximately 41.43 km2.

Rich in natural beauty and features, Saugeen First Nation offers hiking, fishing, and swimming, together with cultural heritage and hospitality. It is home to the fascinating limestone Saugeen First Nation Amphitheatre and adjacent rock gardens. South Sauble Beach Park is renowned for its

long and shallow sandy beach.

Chippewas of Nawash Unceded First Nation

Neyaashiinigiing First Nation, or Chippewas of Nawash Unceded First Nation, is an Ojibway (Anishinaabe) First Nation located on Cape Croker, along the Georgian Bay of Lake Huron. It is surrounded by water on three sides and the main reserve (Neyaashiinigiing 27) is approximately 63.84 km². The resident population of the Chippewas of Nawash reserve was 615, in 2016. The Band role has about 2080 on its list.

Before the arrival of the British, the Saugeen Ojibway occupied a land base of about 2 million acres, roughly from the Town of Arthur and extending north to Georgian Bay and west to Lake Huron.

Neyaashiinigiing is home to the Jones Bluff and the Sydney Bay Bluff, as well as [Cape Croker Park](#). The Bruce Trail passes through Neyaashiinigiing and both bluffs.

Six Nations of the Grand River Territory

Six Nations of the Grand River, the most populous nation in Canada, is located along the banks of the Grand River in Southern Ontario. It is the only reserve in North America where all six Haudenosaunee nations live together – Mohawk, Tuscarora, Seneca, Cayuga, Onondaga, and Oneida. The Lenape people (Delaware) are also members of Six Nations.

Six Nations once occupied 3,800 km² of land that stretched from the mouth of the Grand River to the river's head.

The Six Nations Reserve is approximately 183.20 km² and, as of 2017, has an on-reserve population of 12,848 people, with a band membership number of 28,520. It is bordered by the County of Brant, Norfolk County, and Haldimand County.

Mississaugas of the Credit First Nation

Mississaugas of the Credit is an Ojibwe (Anishinaabe) First Nation that once occupied and exercised stewardship over about 3.9 million acres in Southern Ontario, from the Rouge River Valley to the headwaters of the Thames River, to Long Point on Lake Erie, and along the shoreline of Lake Erie, the Niagara River, and Lake Ontario (See Figure 7.5.1 B).

The Mississaugas of the Credit First Nation reserve (known as New Credit) is 25.18 km² and is adjacent to the Six Nations of the Grand River reserve. There are approximately 2,570 members, about two-thirds of whom live off-reserve.

Beausoleil First Nation (Christian Island)

Beausoleil First Nation, or G'Chimissing, is an Ojibwe (Anishinaabe) Nation located in Southern Georgian Bay, on Christian, Beckwith, and Hope Islands, close to the communities of Penetanguishene and Midland. The nation's reserve land totals approximately 27.45 km² and has a population of 614 people, as of 2018, with a band membership of 2,587.

Métis Nation of Ontario

The Métis Nation of Ontario (MNO) was formed in 1993 to represent Métis individuals and communities throughout Ontario. The Métis Nation works to protect and preserve the distinct culture, heritage, lands, and waters of the Métis Nation and has built a province-wide governance structure to support the rights of its citizens.

Local Métis councils across the province operate with the support of the MNO. They serve as a connection point for local Métis people and provide a link to the provincial representation of the MNO. Those listed below fall within the Niagara Escarpment Biosphere and have an interest in the Biosphere.

Georgian Bay Métis Council

This council represents the largest concentration of Métis within the Métis Nation of Ontario. This council encompasses most of North Simcoe. Offices are located in Midland.

Great Lakes Métis Council

This council's area spans from Tobermory, Owen Sound, Meaford, Collingwood, Harriston, Point Clark, and Pine Tree Point. Offices are located in Owen Sound.

Credit River Métis Council

The Credit River Council represents Métis citizens in the densely populated Halton and Peel region. Offices are located in Brampton.

Grand River Métis Council

This council's area encompasses Cambridge, Kitchener, Guelph, St. Mary's and north to Petherton, Monck, and Minto. Offices are located in Kitchener.

Niagara Region Métis Council

This council represents the Métis citizens of the Niagara Region. Offices are located in Thorold.



Feeding the chickadees at LaSalle Park Marina boardwalk, Burlington.

Huron-Wendat Nation

The Huron-Wendat Nation (or “Nation Huronne-Wendat” in French) is an Iroquoian-speaking nation whose people historically inhabited the area between Lake Simcoe and Georgian Bay.

The current reserve lands of the Huron-Wendat Nation are at Wendake, Quebec, a municipality enclosed by Quebec City. In May 2022, the registered population of the Huron-Wendat Nation totaled 4,605. Offices are located in Wendake, Quebec.

7.5.2 What form does this representation take: companies, associations, environmental associations, trade unions (list the various groups)?

Refer to section 7.5.1 for descriptions of various groups.

Niagara Escarpment Commission biographies can be found [here](#).

About the Niagara Escarpment Biosphere Network Board and the Organization

The Network is an incorporated not-for-profit organization, under provincial law. Its board of directors currently consists of members of the previous Transition Leadership Committee, members of Plenty Canada who are assisting

and advising the Network in its development, members who have deep experience with UNESCO, and others selected collectively by the Board of Directors for their credentials and capacities to serve the goals and objectives. Several additional positions remain to be filled, which a Governance and Nomination sub-committee will manage with the involvement of network partners. Board terms are three years. The organization’s commitment is to be as transparent as possible while ensuring work gets accomplished efficiently, without political interference, and that it reflects diversity, experience, skill sets, professionalism, and functionality.

The Network has established a board of directors that is based upon a co-governance model with Indigenous Peoples and features a diverse group of members from along the Niagara Escarpment from north to south. See [Governance | Niagara Escarpment Biosphere Network](#) for detailed Network Board Member bios/locations.

7.5.3 Indicate whether there are procedures for integrating the representative body of local communities (e.g., financial, election of representatives, traditional authorities).

Refer to section 7.4.3 for the role and procedure for the Commission and its Commissioners in administering the NEP. The Network has a set of by-laws that govern



Moments before the 2016 official unveiling of Landscape Of Nations: The Six Nations and Native Allies Commemorative Memorial on Queenston Heights, Tuscarora scholar Richard Hill takes a quiet pause at the turtle symbol pavement, focal point of entry to the memorial.

its activities. See section 7.2 for more details. There is no current structure for local authorities to engage with the Biosphere. During forthcoming strategic planning sessions the Board will evaluate models of engagement with local governments. We have sought endorsements from municipal councils and have received nine positive responses of endorsement.

7.5.4 How long-lived is the consultation mechanism (e.g., permanent assembly, consultation on specific projects)?

The Commission has been in place since the NEPDA came into existence in 1973. Broad community consultation on the development of the NEP 2017 has occurred since the first plan was developed in 1985 and for any subsequent updates.

The Network in its new role as convener of the Biosphere does not have a formal consultation method at this time. However, in the short time of its operation, it has amassed a large distribution list of organizations and individuals that may have an interest in the Biosphere. They have been asked to contribute to various initiatives such as sharing articles for the Network website, and developing priorities

for the Network. The Network has also conducted visits to various locations to build broad support. It is recognized that a comprehensive consultation system must be developed and this will be a high priority for the Network.

7.5.5 What is the impact of this consultation on the decision-making process (decisional, consultative or merely to inform the population)?

As described in 7.4.3 above, commissioners of the Commission serve as regulators and make independent decisions related to the Act and Plan, but do not form a governing board. They also must consult on any updates or amendments to the NEP. The MOU with the MNRF recognizes the independence of the Commission in making regulatory decisions, but directs that the Commission must comply with the Act and make decisions that do not conflict with the Niagara Escarpment Plan.

The Network as stated above is a “network of networks” and does not have decision-making authority for the network.

7.5.6 At which step in the existence of a Biosphere reserve is the population involved: creation of the Biosphere reserve, drawing up of the management

plan, implementation of the plan, day to day management of the Biosphere reserve? Give some practical examples.

As stated above, there was considerable consultation on updates to the NEP 2017 plan, and there continues to be consultation on any updates on an ongoing basis.

The Commission encourages awareness of the NEP and the Biosphere to the public, partners and clients by:

- Promoting the objectives of the NEP and the NEPDA through sustainable land use planning and policy implementation in the NEP Area;
- Increasing awareness of the Biosphere through a variety of outreach and communications initiatives;
- Providing opportunities for information and knowledge exchange between Niagara Escarpment community partners has been a priority for the Commission and now the Network.

Some education, outreach and engagement highlights over the last 10 years are included in Annex IX.

Public participation in decision-making processes is an important aspect of the Biosphere co-governance structure. At the 2023 Annual General Meeting of the Network, the public was invited to participate through an engagement survey and asked the following questions to help inform future processes including the development of a Biosphere strategic plan:

- 1) What does Niagara Escarpment mean to you? Why do you think the UNESCO designation of a “Biosphere” is important?
- 2) What has changed within the Niagara Escarpment Biosphere over the last 10 years – what changes have you noticed?
- 3) What do you think are the biggest challenges for preservation and conservation within the Niagara Escarpment Biosphere?
- 4) Have you seen any positive examples of conservation, biodiversity, or projects or activities that you feel are contributing to the sustainability of the Niagara Escarpment Biosphere? Could this be replicated over the bigger geography of the whole Biosphere?
- 5) Which types of partners would you like to be better connected with? Do you have initiatives that would benefit from wider publicity?

- 6) In the future, assuming the Network is successful, what could we do for you? How might the Network help you / and or your organization do your work?

The development of a strategic plan for the Biosphere remains a priority of the Network. The public will have the opportunity to contribute their insights, concerns, and suggestions to further shape the goals, vision, and objectives of the strategic plan and management plans. This will also ensure that future plans are reflective of local values, needs, and aspirations. Once the strategic and management plan is in place, the population will be involved in the implementation of the strategies outlined in the plan.

Community members, organizations, and local authorities may participate in specific projects, conservation efforts, and initiatives. Ongoing communication and collaboration with the population are crucial to successful plan implementation and help ensure that the Network remains a dynamic and responsive network that meets the needs of the local population.

7.6 Update on management and coordination structure:

7.6.1 Describe any changes regarding administrative authorities that have competence for each zone of the Biosphere reserve (core area(s), buffer zone(s) and transition area(s))? If there are any changes since the nomination form/last periodic review report, please submit the original endorsements for each area.

The decision-making and legislative power of the land use planning and management of the Biosphere has not changed; it remains with the Commission and with the various agencies of government. The Network now holds the responsibility for the coordination of the Biosphere.

See 4.4 2.3.9 and 5.11 on the 2022 Auditor General’s Audit of the Commission.

7.6.2 Update information about the manager(s)/ coordinator(s) of the Biosphere reserve including designation procedures.

As a new organization, the Network is working towards developing set procedures for future periodic review processes related to designation procedures. The Commission still assumes the responsibility for planning and policy as it relates to land management and development. See 7.1 for the complete genesis story of the newly established Network.

7.6.3 Are there any changes with regard to the coordination structure of the Biosphere reserve? If yes, describe in detail its functioning, composition and the relative proportion of each group in this structure, its role and competence. Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager of the Biosphere reserve?

Network Co-Governance Structure

To read more about co-governance, refer to section 2.1. The Network subscribes to the principles of Two-Eyed Seeing and Ethical Space, and as such, expects that the building of capacity through regular training will result in effective governance among various partners throughout the Biosphere. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.) This will result in more effective coordination, knowledge sharing, and sustainable development based on natural law. It should be understood, given the vast territory of the Biosphere and the significant difference in population densities from the south to the north, that it's important that there be great flexibility and local creativity in applying governance principles and technical applications of appropriate sustainability efforts. The coordination is autonomous from local or central governments but includes engagement and partnership with all levels of government including Indigenous governments. In the next couple of years, the Network will cultivate a senior management position that will expand the capacity of the Network to coordinate activities.

7.6.4 How has the management/coordination been adapted to the local situation?

Please refer to section 7.6.3 for further information.

7.6.5 Was the effectiveness of the management/coordination evaluated? If yes, was it according to a procedure?

During the 2012 periodic review, the effectiveness and coordination of the Commission as the Biosphere organization was assessed. Through discussions with the CCUNESCO, and partners across the Biosphere, an opportunity to recreate the leadership of the Biosphere was presented. It became evident that a genesis of a new grassroots organization built on the strength of the partners' knowledge and participation in the Biosphere would greatly serve the Biosphere. The 2012 periodic review of the Biosphere noted that "There are powerful environmental bodies and formal organizations who are taking the lead to conserve, protect, research, monitor,

and provide educational outreach." and that there was a need for these organizations to take a more formal role in responsibility for the Biosphere. The organization responsible for the Biosphere needed to be viewed as the primary coordinator for communities and partners within the Biosphere region. The Commission supported the initiation of this process resulting in the evolution of the Network. See 7.1 for more details on this process. The management of the Commission on the Niagara Escarpment Plan was evaluated by the Auditor General in 2022. See 5.11 for more information.

The Network is taking the steps as a new organization to internally evaluate its board and ensure that the co-governance principles are consistently being upheld. The board will continue to make assessments on its effectiveness and implement structures for efficiency assessments into its strategic planning. The Network recognizes that as a "network of networks" it must be adaptable to the needs of the Biosphere and its partners, and for this reason assessing the effectiveness of its coordination and responsibility of the Biosphere must be an iterative process.

7.7 Update on the management/cooperation plan/policy:

7.7.1 Are there any changes with regard to the management/cooperation plan/policy and the stakeholders involved? If yes, provide detailed information on process for involvement of stakeholders, adoption and revision of the plan.

The NEP is periodically updated as described above in Section 2.3.1. The following describes the updates made in 2017 in addition to relevant policy changes of other provincial plans. These policy changes are described on the province's Environmental Registry. Refer to the [Environmental Registry of Ontario](#) for a copy of the full proposals, comments submitted, and decisions on policies (Registry number: 012-7228).

The Niagara Escarpment Plan is the longest standing provincial plan having being instated in 1985 and subsequently updated in 1994, 2005, and now most recently in 2017 under a coordinated review with 3 other more recent provincial plans.

These four complementary provincial land use plans, known collectively as Ontario's Greenbelt Plans and the Growth Plan, provide a comprehensive and integrated planning framework to manage growth, direct infrastructure investments and promote economic prosperity, while protecting and conserving the valuable



“All Our Relations” is a new public art display in Hamilton Harbour, designed by award-winning Cree/Metis fashion designer Angela DeMontigny.

natural heritage of the Greater Golden Horseshoe Region and Greenbelt Plan area.

The Niagara Escarpment Plan area was incorporated into the Greenbelt Plan in 2005.

Decision on policy

Four provincial land use plans work together to manage growth, build complete communities, curb sprawl, and protect the natural environment in Ontario’s Greater Golden Horseshoe region. The Province, under the lead of the Ministry of Municipal Affairs and the Ministry of Natural Resources and Forestry, began a coordinated review in February 2015 of the four provincial land use plans: Growth Plan for the Greater Golden Horseshoe, 2006; Greenbelt Plan, 2005; Oak Ridges Moraine Conservation Plan, 2002; and the Niagara Escarpment Plan, 2005.

This was the first time the NEP was reviewed at the same time as the other three plans. This new coordinated review was an opportunity to address challenges with the plans in a cohesive way.

The four plans provide an integrated regional framework

and work together to manage growth, protect our agricultural lands and the natural environment, and support economic development in Ontario’s Greater Golden Horseshoe and Greenbelt. They encourage the development of compact, complete, and vibrant communities that make better use of our infrastructure and transit investments, and help to reduce greenhouse gas emissions. While the Niagara Escarpment Plan forms part of these plan areas, it has an environment-first policy objective that differs from the other plans.

Public consultation took place for 90 days, from February 27, 2015 to May 28, 2015 (Registry # 012-3256). The input and recommendations received from the public, municipalities, stakeholders, Indigenous communities, and an expert Advisory Panel established to review the four plans helped shape proposed changes. See Registry # 012-3256 regarding the 2015 consultation for an overview of issues raised.

On May 10, 2016, the Province made the four proposed revised plans available for public input in accordance with each plan’s respective legislation. The proposal notices were:

- Proposed Growth Plan for the Greater Golden Horseshoe, 2016 (012-7194)
- Proposed Greenbelt Plan (2016) (012-7195)
- Proposed Oak Ridges Moraine Conservation Plan (2016) (012-7197)
- Proposed Niagara Escarpment Plan (2016) (012-7228)

The Province held 12 open houses and 6 technical briefings across the region for members of the public and stakeholders to learn more about the proposed changes. In addition, there was continued engagement of Indigenous communities. The Commission itself hosted two additional public information sessions in Mulmur Township and Owen Sound in September 2016, to respond to the significant interest in the proposed changes to the NEP in the northern NEP Area.

Comments were accepted by email, webform, mail, and fax. This period of public consultation took place for 174 days, from May 10, 2016 to October 31, 2016.

As a result of public consultation on the proposal, the ministry received a total of 902 comments; 863 comments were received in writing and 39 were received online.

There were 440 submissions received on the EBR with comments on the proposal notice to Amended Niagara Escarpment Plan (2016) either submitted through the Environmental Registry or referencing the Environmental Registry Proposal Notice. In addition, there were 3,134 email campaign submissions that referenced the NEP EBR post.

As a result of the broader public consultation on the four proposed plans, the Province received over 23,000 comments; 2,430 unique submissions were received and almost 21,000 comments were received as part of letter-writing campaigns.

The Commission considered these comments in making its final recommendations to the government on the changes to the NEP. These recommendations were provided to the government in early 2017 and included the Commission's positions on the proposed NEP Area additions, the proposed NEP policy and mapping changes, and more than sixty site-specific NEP amendment requests.

While there was general support for the overall direction of the proposed changes to the four plans, some concerns were raised. These comments touched on a range of issues and submissions often made competing recommendations.

Consistent with the key goals of the plans and the objectives of the review, a balanced approach was taken

to finalizing the plans, and several changes were made to address the concerns raised through the consultation. A summary of the policy changes related to the NEP are included below.

Niagara Escarpment Plan (2017) - Proposal Notice 012-7228

The following summarizes feedback received by the Province through consultation and subsequent changes made to finalize the Niagara Escarpment Plan:

Natural Heritage

Positive feedback was received from the environmental sector, municipalities, and conservation authorities in support of protecting and enhancing environmentally sensitive lands, largely stemming from concerns over the impacts of development on wildlife, species at risk and biodiversity.

Compared to the policies consulted on in May 2016, the following changes were made:

- Refining Natural Heritage Policies to recognize key natural heritage features, acknowledge requirements for endangered and threatened species.
- Providing increased consistencies between definitions and policy approaches in the Provincial Policy Statement and the other land use plans.
- Revising policies regarding key hydrological features and vegetation protection zones.

Agriculture

The protection of agricultural land, more specifically prime agricultural land (including tender fruit), was highlighted as an important goal by a broad range of stakeholders (agriculture community, conservation authorities, and municipalities), although some acknowledged that protecting agricultural land may compete with other economic interests such as land development.

There was general support expressed by agricultural stakeholders for policies or policy changes that support the farming community through greater flexibility in on-farm activities and other agriculture-related uses.

Compared to the policies consulted on in May 2016, the following changes were made:

- Clarified Agricultural Related Use Policies and On-Farm Diversified Uses while introducing flexibility to allow larger sizes where they are compatible with the site and the surrounding landscape.

- Other changes to Agricultural policies which will support agricultural viability within the Niagara Escarpment Plan area include:
- Removal of reference to Specialty Crop Areas since the definition of prime agricultural areas includes Specialty Crop Areas, and there are currently no Specialty Crop Areas in the NEP area;
- Introduction of the concept of Agricultural System to improve alignment with the approach of the other plans; and
- Removal of winery policies where accessory uses may not be classified as development and not require a development permit.

Aggregates

The aggregate sector expressed concern that aggregate extraction opportunities are being further restricted through plan policies and land use designations, however, many stakeholders including municipalities and the environmental sector supported the clear and streamlined policies.

Compared to the policies consulted on in May 2016, the following changes were made:

- Clarifying the definition for mineral aggregate operations.
- Introducing policy to encourage comprehensive rehabilitation of mineral aggregate operations consistent with the Provincial Policy Statement.
- Continuing to maintain a relative status quo with respect to aggregate policies while clarifying designation criteria, modernizing language, and harmonizing with the other plans where appropriate.

Institutional Uses/Permitted Uses

Compared to the policies consulted on in May 2016, the following changes were made:

- Where institutional uses are permitted in the NEP, propose a limit of 500 square meters unless it can be demonstrated, through the consideration of the impact of a proposal, that a larger facility will be compatible with the escarpment environment.
- Modifying bed and breakfast policies to achieve similarity with the Oak Ridges Moraine Conservation Plan (e.g., remove 3 bedroom limit).

Recreation

Stakeholder feedback showed broad support for proposed policies that provide stronger flexibility for recreational uses and more protection for sensitive environments.

Compared to the policies consulted on in May 2016, the following changes were made:

- Reorganizing and refining recreation policies to identify classes of permitted recreational uses and consolidate trail development policies, including those relating to the Bruce Trail.
- Clarifying permitted recreational uses including permitting banquet and conference facilities associated with a golf course.
- Amending the Niagara Escarpment Parks and Open Space System (NEPOSS) policies to clarify that NEPOSS is a framework for the establishment and coordination of publicly owned lands along the escarpment.

Land Use Designations Mapping

Mixed views were expressed regarding updating the land use designation mapping. Some stakeholders (industry association and some municipalities) have expressed concern that the updated land use designation mapping will result in increased prohibitions upon aggregate extraction and development. The environmental sector supported the changes and viewed increases in the extent of protective designations as positive.

Based on stakeholder feedback and recommendations received from the Commission, maps were updated with more accurate current data to reflect current conditions on the landscape, specifically:

- Endorsing criteria for mapping of valleylands;
- Maintaining the defined Escarpment brow;
- Removing “outliers” from the definition of Escarpment Related Landforms which applies to Escarpment Natural and Escarpment Protection designations;
- Clarifying the criteria for mineral resource extraction areas to include licensed pits and quarries producing more than 20,000 tonnes annually;
- Re-designating portions of the Escarpment Recreation areas and expanding Escarpment Natural criteria to include provincially significant wetlands and wetlands greater than 20 hectares.

Site-Specific Amendments

The Niagara Escarpment Planning and Development Act (NEPDA) states that amendment applications to permit urban uses and applications to re-designate lands as Minor Urban Centre, Urban Area, or Escarpment Recreation Area may only be made during the review of the NEP. There were 65 site-specific amendment applications submitted to the Commission for consideration. Two of these applications were withdrawn by the applicants. Most of the feedback received was from municipalities commenting on the proposed site specific amendments.

The Commission recommended to the Minister of Natural Resources and Forestry to either approve or refuse each of the applications for the amendments.

All applicants who submitted site-specific amendment applications will be notified by the government of the status of their application.

Assessment of Proposed Additions

The historic basis of the current Biosphere boundary is the boundary of the NEP area, as defined by the Niagara Escarpment Planning and Development Act (NEPDA), 1973. The NEPDA established the planning process to ensure the area with the NEP and therefore the area of the Biosphere, would be protected by this provincial land use legislation. The NEP area, analogous with the Biosphere area, includes the escarpment and land in its vicinity. The 2015 Coordinated Review provided an opportunity for the Commission to propose additions to the NEP area that would meet the Biosphere Reserve criteria for lands to be added.

The Commission assessed over 80,000 hectares and proposed a number of additions of land to the NEP area based on criteria that support the purpose and objectives of the Plan. In total, the Commission identified about 45,000 hectares that could be added.

The lands were located mainly in Grey County and, to a lesser extent, in Dufferin County and Simcoe County. Small potential additions were also identified in Bruce County and the Niagara Region.

After considering the comments received during consultation, in which municipalities, the public and other stakeholders were largely in opposition to the proposed additions to the Plan, and the recommendations of the Commission, the government has decided not to add lands to the NEP area.

Growth Plan for the Greater Golden Horseshoe, 2017 - Proposal Notice 012-7194

The Growth Plan for the Greater Golden Horseshoe, 2017 (“Growth Plan, 2017”), builds upon the Growth Plan for the Greater Golden Horseshoe, 2006, which provided a framework for implementing Ontario’s vision for building stronger, prosperous communities by better managing growth in this region.

The Growth Plan, 2017 includes enhanced policy direction to respond to the key challenges that the region will continue to face to the horizon of the Plan and beyond. With some exceptions, most of the changes in the Proposed Growth Plan are carried through into the Growth Plan, 2017. The following summarizes feedback received by the Province through consultation and subsequent changes made to finalize the Growth Plan, 2017 related to the implementation of the Niagara Escarpment Plan:

Where and how to grow

Overall, most submissions were supportive of policies that would facilitate the creation of compact, complete communities with a diverse range of housing that better connects transit to where people work. Most submissions from the general public and the environmental sector expressed support for the increased intensification and designated greenfield area density targets which will be phased in, using interim density and intensification targets. Policy direction to promote intensification generally throughout the built-up area has been re-instated, with the added direction that the intensification is to support the desired urban form.

Several submissions raised concerns regarding development in hamlets and other small, unserviced settlement areas being counted towards the intensification target. To address this, the Growth Plan, 2017 has been revised to distinguish between delineated built-up areas and undelineated built-up areas. Updated policy direction is provided to clarify how growth is to be allocated, including limiting growth and types of uses permitted in undelineated built-up areas.

Feedback expressed support for increased protection of employment lands from conversion to non-employment uses, but many municipalities requested more flexibility than what was proposed. The Growth Plan, 2017 maintains increased protection for employment lands, provides policy direction on planning for office parks and retail uses, and makes the identification of “prime employment areas” optional. The Growth Plan, 2017 also introduces policies to

encourage undertaking a coordinated approach in planning for large areas with high concentrations of employment that cross municipal boundaries.

The Growth Plan, 2017 directs municipalities to consider using available tools to require that multi-unit residential development incorporate a mix of unit sizes to accommodate a diverse range of household sizes and incomes.

Settlement Area Boundary Expansion for Towns and Villages in the Greenbelt

Policies pertaining to settlement boundary expansions in the Greenbelt set out in the Proposed Growth Plan, 2017 have been revised to provide additional clarity of what constitutes a permitted modest expansion. Final policies define the term “modest” expansion to mean no more than 5 percent, up to a maximum of 10 hectares in area, with only half of the expansion area being residential. A municipality must also demonstrate that an expansion will support complete communities and/or the local agricultural system, and that these uses cannot be reasonably accommodated within the current settlement area boundary.

Infrastructure to support growth

The Province heard broad support for proposed policies to make more efficient use of infrastructure and better integrate infrastructure planning with land use planning. Very few changes were made to the policies proposed in May 2016.

Protecting what is valuable

Recurring feedback expressed concerns about the impact of growth and development on the region’s agricultural land base, natural heritage and water resources. Many submissions expressed support for policies which recognized their value and increased their protection while supporting a vibrant agricultural sector.

Policies in the proposed plan pertaining to water resource and natural heritage systems (NHS) protection have been finalized to include direction on how to transition policies on watershed planning, natural heritage and agricultural systems, and aggregates. This responds to concerns raised in some submissions while maintaining enhanced protection for these features and areas. As proposed, municipalities will be required to incorporate and protect a natural heritage system as mapped by the Province.

Through the consultation process there was widespread support for policies that enhanced the agriculture sector’s viability, including that the Province, in collaboration with municipalities and other parties, would be required to identify an “agricultural system” for the whole GGH. However, several submissions requested more clarity on natural heritage buffers. The final plan responds by clarifying policies exempting agricultural uses from requirements to undertake environmental studies in the natural heritage system; however, best management practices will be required to ensure ecological impacts are minimized. They also clarify that where natural heritage and agricultural systems overlap, aggregate operations will be required to balance rehabilitating the site to both conditions, where feasible.

Submissions also reflected widespread interest in policies that address climate change at the local level. Minor changes were made to align the plan with Ontario’s Climate Action Plan, and greater clarity has been provided on the outcomes expected from municipal policies to reduce greenhouse gas emissions and address climate change adaptation goals.

The final changes to the plans also provide greater clarity on the relationship between the agricultural system and natural heritage system.

This section now also recognizes the value of incorporating **Indigenous Traditional Knowledge** in planning decisions.

For more detailed information on the precise wording of a change or definitions of a term used above, please refer to the Growth Plan for the Greater Golden Horseshoe, 2017 which can be found at www.placestogrow.ca.

The policies of the Growth Plan for the Greater Golden Horseshoe came into effect on July 1, 2017.

Greenbelt Plan (2017) - Proposal Notice 012-7195

The Greenbelt Plan identifies where major development should not take place. It provides direction for the protection of agricultural lands and environmental lands, while providing for a range of recreational, tourism, and cultural opportunities.

The following summarizes feedback received by the Province through consultation and subsequent changes made to finalize the Greenbelt Plan, 2017:

Agricultural System

The Province received positive feedback on proposed policy changes that would provide stronger protections for impacts on agricultural lands, permit a wider range of economic activities on farms and add updated policies to plan for, support and encourage the agri-food network. Stakeholders requested stronger policies around supporting the agri-food network and the final plan contains enhanced policies requiring municipalities to plan for and consider the agri-food network in decision-making.

Feedback also emphasized the need to clarify how non-agricultural uses were to mitigate impacts occurring on adjacent agricultural operations. The plan policies now direct that when mitigation measures are required where agricultural and non-agricultural uses interface, these measures should be incorporated as part of the non-agricultural use.

Natural System

Stakeholder feedback indicated broad support for proposed policies that provide stronger and balanced protection for the features and functions of the **Natural Heritage System**

and **Water Resource System**. Stakeholders requested changes in how these policies would impact agricultural buildings, structures and uses.

The final plan includes policies that provide clarity and refinement for how these policies balance the protection of features and functions with the importance of supporting the viability of agricultural uses. In key hydrologic areas, policies provide an exemption from study requirements where the total impervious surface area of agricultural buildings does not exceed 10% of the lot. In proximity to key hydrologic and key natural heritage features, agricultural buildings are exempt from study requirements where a 30m buffer is provided.

Clarity is also provided that existing agricultural uses can continue to occur within buffers from features, but that these uses shall also pursue best management practices to protect and/or restore these features and functions. In the Niagara specialty crop area, flexibility is provided for the location of agricultural buildings near certain watercourses (drains, swales, roadside ditches) that are determined through provincially approved mapping.



.At the 2023 annual pow wow at Neyaashiinigiimiing, children, women and men come together to celebrate life with its traditions and teachings; the pow wow is a time for renewing old friendships and making new ones.

Infrastructure Planning

The Province heard broad support for proposed policies to make more efficient use of infrastructure and better integrate infrastructure planning with land use planning. Some sectors requested an expanded range of permitted uses outside of Greenbelt settlement areas (e.g. serviced recreational uses, community facilities, cemeteries), and some sought clarity and flexibility around the location of stormwater management facilities near features in the Greenbelt “fingers” adjacent to settlement areas.

The final plan clarifies that some naturalized components of stormwater management systems may be permitted within the minimum buffers of significant valleylands in the Greenbelt “fingers” subject to being located outside of all other features and their minimum buffers. It also clarifies that cemeteries will continue to be a permitted use on rural lands.

Harmonization and Implementation

Stakeholders expressed support for the increased policy consistency and harmonization across the four provincial plans and the Provincial Policy Statement, 2014, where applicable.

Compared to the draft Plan consulted on in May 2016, additional minor changes have been made to enhance consistency and further align terms, definitions, and policies.

Refinements were also made relating to plan implementation, including clarifying that refinement of the Natural Heritage System (NHS) may occur when a municipality brings its official plan into conformity with the Growth Plan. For the Greenbelt Plan, no further refinements of the NHS can occur where a municipality has already brought their Official Plan into conformity with the 2005 Greenbelt Plan. Reference to consultation with Indigenous communities when developing performance indicators to measure the effectiveness plan policies was also added.

Growing the Greenbelt

The Province heard varied views regarding proposed policies related to Growing the Greenbelt. While some supported the proposed provincially led process to identify areas of ecological and hydrological significance to be added to the Greenbelt, others were of the view that municipal support should be required to add land to the Greenbelt Plan area.

Policies around growing the Greenbelt that were consulted on in May 2016 have been retained in the Greenbelt Plan, 2017.

Oak Ridges Moraine Conservation Plan (2017) - Proposal Notice 012-7197

The Oak Ridges Moraine Conservation Plan (ORMCP) is an ecologically-based plan that provides land use and resource management direction for the 190,000 hectares of land and water within the Moraine. Together with the area covered by the Niagara Escarpment Plan, the ORMCP area is part of the Greenbelt which identifies where urbanization should not occur in south-central Ontario, in order to provide protection to environmental and agricultural lands.

Compared to changes proposed in May 2016, few changes have been made to the ORMCP 2017. In response to stakeholder concerns with the proposed changes to the definition for infrastructure, the final plan contains clarified wording to state that new waste disposal sites are prohibited within the Natural Core or Linkage designations as well as in key hydrologic and key natural heritage features and their minimum buffers. The majority of changes consist largely of minor editing of wording to revise and align terms, definitions, and policies with the other provincial plans and the Provincial Policy Statement, 2014.

7.7.2 Describe contents of the management/cooperation plan (provide some examples of measures and guidelines). Is the plan binding? Is it based on consensus?

See section 7.7.1 above for details.

7.7.3 Describe the role of the authorities in charge of the implementation of the plan. Describe institutional changes since the nomination form/last periodic review report. Please provide evidence of the role of these authorities.

The Commission is a regulatory agency responsible for the implementation of the NEP. Please refer to Section 7.4.3 for more information.

7.7.4 Indicate how the management plan addresses the objectives of the Biosphere reserve.

The Biosphere strives to be an exemplary model site of excellence in the areas of sustainable development, scientific research, Indigenous reconciliation, and biodiversity conservation. The NEP is the foundation for

the Biosphere reserve status for the Niagara Escarpment. The Biosphere designation is aligned with the purpose and objectives of the NEP and the core responsibilities of the Commission. The Commission has now transitioned out of its convenor role and the new Network has achieved incorporated not-for-profit status and is lead convenor for the Biosphere.

7.7.5 What are the progresses with regard to the guidelines of the management/cooperation plan/policy?

The 2017 NEP provides that the Commission, in consultation with MNRF, may issue guidance material and technical criteria to assist the implementing authority with the policies of the Plan. Information, technical criteria, and approaches outlined in guidance material are meant to support, but not add to or detract from the policies of the Plan.

The Commission has approved technical criteria for Visual Impact Assessments and has initiated technical criteria for the preparation of Vegetation Protection Plans, and landscape construction drawings, as well as for complete applications and pre-consultation. Commission staff intend to seek Commission approval of the technical criteria for Landscape Plans and Vegetation Protection Plans in early 2023. The complete application and pre-consultation guidelines are approved and in use. The Commission has also begun to develop policy guidance material for on-farm diversified uses, dwelling units' accessory to agricultural uses, secondary dwelling units, and special events.

The Commission has had several discussions regarding how the NEP policies support agriculture. In November 2021, the Commission considered a staff report on the agricultural policies of the NEP and directed staff to bring forward a proposal for the Commission to initiate a Plan amendment for specific agricultural policies. In November 2022, staff brought forward a Plan amendment which the Commission recommended be initiated (circulated and comments requested). The Commission also requested staff undertake further analysis and continue with the development of policy guidance material. These activities will continue in 2023-24.

7.7.6 Were there any factors and/or changes that impeded or helped with the implementation of the management/coordination plan/policy? (Reluctance of local people, conflicts between different levels of decision-making).

See 7.7.1 for input received to changes in the NEP 2107, e.g., the opposition to the addition of area to the NEP at the time.

7.7.7 If applicable, how is the Biosphere integrated in regional/national strategies? Vice versa, how are the local/municipal plans integrated in the planning of the Biosphere reserve (Please provide detailed information if there are any changes since the nomination form/last periodic review report).

Refer to Section 7.7.1 that describes the context of the four provincial plans that work together to manage growth, build complete communities, curb sprawl, and protect the natural environment in Ontario's Greater Golden Horseshoe region.

8. CRITERIA AND PROGRESS MADE



Bruce Trail staff and advisors (including Network board member Tim Johnson) gather at the site of the first proposed BT Indigenous Healing Garden at Smokey Hollow, Waterdown. For more than half a century, the Bruce Trail Conservancy has worked to protect and connect lands and watersheds of the Escarpment.

8. CRITERIA AND PROGRESS MADE:

Conclude by highlighting the major changes, achievements, and progress made in your biosphere reserve since nomination or the last periodic review. How does your biosphere reserve fulfill the criteria. Develop justification for the site to be a biosphere reserve and rationale for the zonation. What is lacking, and how could it be improved? What can your biosphere reserve share with others on how to implement sustainable development into practice?

Brief justification of the way in which the biosphere reserve fulfills each criteria of article 4 of the Statutory Framework of the World Network of Biosphere Reserves:

1. “Encompass a mosaic of ecological systems representative of major biogeographic region(s), including a gradation of human interventions”.

The Niagara Escarpment Biosphere integrates three critical functions enabling its role as a hub of excellence for

investigating and showcasing strategies in conservation and sustainable development at a regional and national level, through sharing of Indigenous Knowledge Systems and western science. Herein, all references to sustainable development are based on the inescapable truth that sustainability does not exist outside of natural law. This fact is frequently expressed by Indigenous Elders and Knowledge Keepers.

Firstly, in the realm of conservation, the Biosphere strives to play a vital role in preserving landscapes, ecosystems, species, and diversity. Secondly, under the banner of development, the Biosphere aspires to support economic and human progress that aligns with socio-cultural and ecological sustainability. Lastly, the Biosphere provides logistical support by facilitating conservation projects, environmental education, skills training, as well as research and monitoring initiatives. These efforts span local, regional, national, and global levels showcasing what is possible, through effective and respectful conservation and sustainable development co-governance.

The Biosphere consists of a mosaic of a diverse collection of ecological systems that represent significant geographic areas. The Biosphere contains a unique and extensive stretch of forested land in south-central Ontario which

includes two major biomes, the boreal needleleaf and the temperate broadleaf forests. The Biosphere stands out as the region with the greatest topographic variability in Ontario, offering diverse habitats spanning over 430 meters in elevation. From Great Lakes coastlines to cliff edges, talus slopes, wetlands, woodlands, limestone alvar pavements, oak savannas, and conifer swamps, the Biosphere hosts a rich array of habitats.

Among the Biosphere's crucial habitats is the Ancient Cedar Forest, home to eastern white cedars over 1,000 years old. Additionally, remnants of tallgrass prairies in Hamilton and Niagara regions - support a diverse array of plant, bird, and insect species. Globally rare alvars, limestone pavements with minimal soil, found on the northern Bruce Peninsula, host many endangered species, attracting eco-tourism enthusiasts world-wide.

The Biosphere transverses the most populous part of Canada and its ecosystems are therefore not isolated from human influence and experience a wide range of human activities. These activities range from minimal or low-impact interactions, such as hiking, and walking in nature to more pronounced actions such as development (roads, infrastructure, business, and housing) and varying intensities of agriculture (vineyards, crops) and aggregate extraction.

“I didn't realize how beautiful the Trail was until I walked the whole thing. This Earth that we're living and walking on is important and has life, and as First Nations we understand that life. Everyone has this understanding, even if they don't realize it, because when you're walking on the Bruce Trail and you see something, you just stand there and sigh at the beauty of it. The Bruce Trail creates that. The Niagara Escarpment creates that. The waterfalls around the Hamilton area are breathtaking” (Co-Chair, Charlene Winger).

Understanding and considering this gradation of human entanglement is crucial for comprehensive ecosystem management of the Biosphere, conservation, and sustainable development planning, as it recognizes the complexity of the interactions between human activities and natural ecosystems and underpins much of the work of the Network.

2. “Be of Significance for biological diversity conservation”.

The Niagara Escarpment holds significant importance for conservation due to several key factors. Firstly, the Escarpment encompasses a variety of ecosystems,

including forests, wetlands, and limestone plains, providing diverse habitats that support a wide range of plant and animal species, thereby contributing to overall biodiversity. Additionally, the Biosphere is home to numerous species of flora and fauna, some of which are endangered, further enhancing the overall biodiversity and ecosystem value. Serving as a natural corridor for wildlife migration, the Escarpment facilitates genetic exchange between populations, contributing to the health and resilience of regional ecosystems. Its role in providing critical habitat connectivity by linking different natural areas is essential for the survival of species, allowing them to move and adapt to environmental changes, such as climate shifts. Beyond its ecological significance, the Biosphere holds cultural and historical importance, and conservation efforts are encouraged and supported to integrate these values, recognizing the interconnectedness of human communities and ecosystems.

Ethical Space, a crucial concept in Canada's response to obligations under the Convention on Biological Diversity, emerged after the 2010 Conference of the Parties meetings in Japan. Pathways 1 was established, involving territories, provinces, and the federal government, with advisory bodies like the Indigenous Circle of Experts and the National Advisory Panel. Their outputs, “We Rise Together” and “Canada's Conservation Vision,” expanded the application of Ethical Space and Two-Eyed Seeing in conservation governance aligned with UN multilateral environmental agreements. The Network in the Biosphere is dedicated to Two-Eyed Seeing and Ethical Space in governance systems and relationships, as outlined in its vision statement emphasizing shared responsibility for a healthy environment and conservation efforts. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)

Portions of the Biosphere have conservation designations such as protected areas, and conservation zones, contributing to the safeguarding of its natural features and biodiversity. Shaped by natural processes like erosion and geological formations, the Biosphere's dynamic landscape contributes to the creation of diverse habitats and plays a role in maintaining the overall ecological balance. Therefore, conserving the Biosphere and its UNESCO designation is crucial for preserving the rich tapestry of life it supports and ensuring the continued functioning of ecosystems in the region. Efforts directed towards protecting and managing this area over the last 50 years contribute not only to local biodiversity but also align with the broader goal of global conservation and sustainable ecosystem management within natural law, as agreed upon

in early treaties between Indigenous Peoples and European newcomers, setting the table for all other settlers.

3. “Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale”. (Including examples or learning experiences from putting sustainable development into practice).

The Biosphere serves as a valuable opportunity to explore and showcase sustainable development approaches on a regional scale through various activities. Its diverse ecosystems provide a living laboratory for highlighting sustainable practices, particularly in biodiversity conservation. For example, the Walker Living Campus at Woodend Conservation Area, situated on the Niagara Escarpment in Niagara-on-the-Lake, is a collaborative initiative between the NPCA and the DSBN and offers an innovative nature-based, living laboratory for students, emphasizing exploration and independent outdoor play. This sustainable learning environment focuses on environmental studies and provides an advanced outdoor education experience for over 39,000 students.

Demonstrating responsible land use, habitat conservation, and restoration efforts contributes to the overall ecological health of the Biosphere, while presenting a model for sustainable tourism and recreation, emphasizing low-impact practices, eco-friendly infrastructure, and community engagement. For example, the Beaver Valley Sustainable Tourism Strategy and action plan were crafted to achieve key objectives: comprehending the tourism

context in the Beaver Valley Corridor, obtaining diverse input from partners, identifying strengths and challenges, and collaboratively creating a long-term sustainable tourism strategy with confirmed actions for the future.

Integrating cultural and historical elements into sustainable development plans recognizes the importance of preserving the Biosphere’s cultural heritage, promoting sustainable agriculture, supporting local artisans, and incorporating traditional ecological knowledge. With multiple jurisdictions and partners, the Biosphere offers an opportunity to demonstrate collaborative co-governance models underpinned in Ethical Space and Two-Eyed Seeing, engaging local communities, Indigenous groups, and governmental bodies in decision-making for inclusive, sustainable development. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)

Serving as an educational hub, the Biosphere facilitates research initiatives and the sharing of resources, promoting innovative solutions applicable to the broader Region. It also showcases sustainable resource management, emphasizing the balance between human needs and ecological integrity in water, soil, and forest management. Additionally, the Biosphere highlights sustainable infrastructure development, including green buildings, and energy-efficient technologies, such as the Brock University Co-generation facility and the Joyce Centre for Partnership & Innovation at Mohawk College. This serves as an inspirational demonstration that can guide similar initiatives in the Biosphere. By leveraging



At the northeastern extremity of the Saugeen/Bruce Peninsula, the Cabot Head Lighthouse guided ships for over 100 years.

these initiatives, the Biosphere promotes and showcases sustainable development approaches that consider environmental, social, and economic considerations. The lessons learned and successes demonstrated can serve as valuable insights, informing and inspiring similar initiatives on a broader scale.

4. “Have an appropriate size to serve the three functions of biosphere reserves”.

The Biosphere, at 194,555 hectares, with its extensive and varied geographical features, is an ideal size to fulfill the three functions of Biosphere Regions. In terms of the conservation function, the Biosphere’s geographic reach accommodates diverse ecosystems, landscapes, and habitats, fostering biodiversity by providing environments for numerous plant and animal species. This size is crucial for maintaining ecological balance and preserving natural processes. For the development function, and in the context of sustainable development, the significant expanse of the Biosphere allows for a diversity of economic projects while ensuring socio-cultural and ecological sustainability. This function encompasses responsible land use planning, such as seen with the Greenbelt and the Commission’s responsibility to administer the Niagara Escarpment Plan (2017), to the integrate human activities with the natural environment. The large reach of Biosphere’s reach helps facilitates the logistical support functions, including environmental education, skills training, research, and monitoring. An example is the Language Nest curriculum, a community-based program designed for the Chippewas of Nawash Unceded First Nation. Its objective is to promote holistic well-being and prevent ill health by delivering community-based projects that teach Anishaabemowin.

All of the above elements are essential for addressing conservation and sustainable development issues at local, regional, national, and global levels. The Biosphere’s size appropriately facilitates the three functions required by providing cultural diversity, shared through Ethical Space for comprehensive conservation efforts, sustainable development practices, and the necessary logistical support for integrated environmental and adaptive management approaches. (See Section L and 2.3.5 for further details on Ethical Space.)

5. Appropriate zonation to serve the three functions.

The Biosphere fulfills its mandate and required functions through appropriate zonation, involving recognized distinct areas tailored to specific purposes. This includes

the designation of legally constituted core areas devoted to long-term protection, aligning with the conservation objectives of the Biosphere, and ensuring a size (66,163 hectares) sufficient to meet these objectives. A surrounding buffer zone (114,488 hectares) exists, where only activities compatible with conservation objectives are permitted. Beyond this zone, is an outer transition area (13,905 hectares) established to promote and develop sustainable resource management practices. This strategic zoning framework aims to harmonize conservation, compatible activities, and sustainable resource management throughout the Biosphere.

6. “Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and the carrying out of the functions of a biosphere reserve”.

Organizational arrangements for the Biosphere ensure the active involvement and participation of various rights holders, partners, and stakeholders. This includes Indigenous governance, engaging through Ethical Space and Two-Eyed Seeing to involve a diverse range of network participants in the design and implementation of the functions associated with the Biosphere. This approach seeks to foster inclusivity, collaboration, and shared decision-making, recognizing the importance of Indigenous Knowledge Systems, that are several millennia in their development, and western science in the management and conservation efforts related to the Biosphere. The Network will continue to engage through its co-governance structure, programs, grants, collaborations, and partnerships, locally, regionally, nationally, and internationally. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)

The Niagara Escarpment Planning and Development Act established a planning process to ensure that the Niagara Escarpment area would be protected. From this emerged the Niagara Escarpment Plan (NEP), which serves as a framework of objectives and policies to strike a balance between development, protection and the enjoyment of this important landform feature and the resources it supports.

When the NEP is updated, comprehensive and extensive consultation is conducted by the government. For the last update, the Province held 12 open houses and 6 technical briefings across the region for members of the public, Indigenous Peoples and community partners

and businesses to input to and proposed changes. The Commission itself hosted two additional public information sessions in Mulmur Township and Owen Sound in September 2016, to respond to the significant interest in the proposed changes to the NEP in the northern NEP Area.

7. Mechanisms for implementation:

a) Mechanisms to manage human use and activities

Human activities are managed and regulated by local, regional, provincial, or national bodies, depending on zone and activities. A comprehensive and integrated planning framework exists to manage growth, direct infrastructure investments and promote economic prosperity, while protecting and conserving the valuable natural heritage of the Biosphere.

In addition, the co-governance framework of the Biosphere aligns with Item 135 of the draft Technical Guidelines for Biosphere Reserves 317 and includes:

i) a “staff/management team”: Plenty Canada currently administers the Network, as decided by the Transitional Leadership Committee, to meet UNESCO criteria for the Biosphere Region. They manage Network activities, staff, and funding from Environment and Climate Change

Canada, supporting the research and establishment of new conservation measures. The funded project, ‘Qualifying UNESCO buffer zones as Conservation Measures within the Niagara Escarpment Biosphere, Ontario,’ spans from 2021-22 to 2023-24, with a two year extension favourably pending.

ii) a “management committee” — a Board of Directors that, as outlined in the Network’s bylaws, ensures that all communities, and thus all levels of local government (Indigenous, municipal, regional), are represented. This body has decision-making power and closely coordinates with the staff/management team.

iii) several “advisory boards” — the Biosphere has several avenues for consultation, including partners such as the Commission, CAs, Conservation Groups, the research network, Elders, Knowledge Keepers, and community members who provide input on the Biosphere’s co-governance and Network activities.

b) Management policy or plan

The Network dream and vision statement reflects Indigenous and non-Indigenous perspectives and commitments to shared responsibilities to the continuity



The “chi-cheemaun” or “big canoe” at Cape Croker Park, Neyaashiinigmiing First Nation.

of life, while working towards protecting the land, water, air, and spirit of G'chi Bimadinaa (Niagara Escarpment in Anishinaabemowin, The Great Cliff That Runs Along). The Network Board adopted this vision statement at the recent 2023 AGM, accepting the commitment to work towards the goal of building and connecting networks of partners across the Niagara Escarpment to share successes and support good practices of conservation that support a low-carbon, diverse, sustainable, resilient, and just future for all. The Network as a collective network understands the importance of iterative processes in its strategic planning; sustaining the fire of the Biosphere together is vital to future planning for the next 5-10 years, and thereby continuing to engage partners in strategic planning will be the priority of the Network in the coming months.

c) Authority or mechanism to implement this policy or plan

Between 2019 and 2022, the administration and governance of the Biosphere transitioned from the Niagara Escarpment Commission to the non-governmental organization, the Niagara Escarpment Biosphere Network. This shift aimed to better connect the Biosphere community. Since its 2022 incorporation, the Niagara Escarpment Biosphere Network has established itself as the central administrative authority. The Niagara Escarpment Biosphere Network represents a collaboration between Indigenous and non-Indigenous communities, emphasizing equal respect for Indigenous knowledge systems and western science. Embracing the concept of Ethical Space and employing Two-Eyed Seeing, the partnership seeks cross-cultural collaboration for restorative actions in ecological integrity, biodiversity, sustainability, and climate change. The ultimate goal is to benefit future generations while maintaining the Biosphere designation. (See Section L and 2.3.5 for further details on Ethical Space and Two-Eyed Seeing.)

d) Programmes for research, monitoring, education, and training

As detailed in this document, the Biosphere has an established research network, works to promote collaboration through the Network in terms of monitoring, education, and skills training, while helping to support these activities in other organizations. Education stands out as a top priority among the Biosphere's objectives, focusing on engaging the public and building awareness of ecology and environmental issues along the Niagara Escarpment. To advance Biosphere goals, prioritized efforts involve public engagement on conservation and sustainable development. The strategy includes forming

partnerships with communities to educate both the public and broader community on these important initiatives. The Network's communication plan, incorporating diverse knowledge systems such as Indigenous traditional Knowledge and western knowledge through the philosophy of Two-Eyed Seeing, serves to broaden sources of biological knowledge and ecological insights. Tailoring messages to diverse audiences and utilizing appropriate channels, the organization aims to build robust relationships, enhance its reputation, and achieve strategic objectives. Regular assessment and adaptation of the plan ensure continuous relevance and effectiveness.

Does the biosphere reserve have cooperative activities with other biosphere reserves (exchanges of information and staff, joint programmes, etc.)?

I. At the national level:

The Network's administrative partner, Plenty Canada, has had experience collaborating with Biospheres across Canada through work with CBRA. The CBRA Indigenous Circle was established through a special gathering of Indigenous Peoples whose traditional territories host Canada's Biospheres, in February 2018. This gathering included Larry McDermott, Executive Director of Plenty Canada and current Network board member, and Tim Johnson, Plenty Canada Senior Advisor, and current Network board member, both acting at the time as Biosphere delegates. The CBRA Indigenous Statement: "Making a Promise" was developed and declared, expressing the Indigenous delegates' unanimous interest in being a part of the Indigenous Circle, which would have "direct participation as partners in the processes, programming, and governance of the organization, and the resources required to ensure full participation, which includes planning, implementation, monitoring, and evaluation" (Indigenous Circle 2018). In fall 2018, the CBRA Board of Directors and the Indigenous Circle came together again, and working in Ethical Space, a collective vision was communicated—a vision with the intent to guide the CBRA in its work to address national and global issues by supporting sustainable development, biodiversity conservation, climate change adaptation, and social justice (Canadian Biosphere Reserves Association 2018).

II. At the regional level:

For other examples of the Biosphere's work to collaborate amongst other Biospheres, refer to 6.4 for information on Brock University UNESCO Research Chair and 6.6 for other examples e.g., Amazing Places, Brand and Story Toolkit, Ethical Space Training, Day on the Hill, etc.

III. Through twinning and/or transboundary biosphere reserves:

There has been communication, in particular, with other Ontario-based biosphere's including Frontenac Arch in south-eastern Ontario at the intersection of terrestrial and riverine ecosystems along the Saint Lawrence River, and the Georgian Bay Biosphere situated within Anishinaabek territory along the eastern coast of Georgian Bay stretching from Port Severn to the French River.

IV. Within the World Network:

The UNESCO Chair on Community Sustainability: From Local to Global led by Network Board Member Liette Vasseur, focuses on advancing sustainability science and its practical application in society. Collaborating internationally, Vasseur works with the Network and Biosphere regions worldwide, broadening the Network's reach and impact. Her outreach efforts integrate conservation, ecosystem management, community engagement, and sustainable development. Vasseur's Biosphere involvement extends beyond her Chair position, including contributions to the development and review of various Biosphere regions. She has authored a guide on

assessing ecosystem services, presented internationally, and evaluated the Biosphere Reserves Institute in Germany in 2023. Internationally, she collaborates on research with the University of the Amazonian State, focusing on biodiversity conservation, sustainable development, and climate change, particularly concerning Indigenous Peoples and Biosphere Reserves, resulting in publications.

The Biosphere participated in the "Brand and Story Toolkit Project", by UNESCO Euro-MAB, that was aimed to create a core brand for World Biospheres to help Biospheres communicate and market their Biosphere locally and helped present the pilot at the 4th World Congress of Biospheres in 2015. This resulted in a new guideline for all Biospheres to use.

Plenty Canada is working with Indigenous Peoples in Biospheres elsewhere in the world. Executive Director Larry McDermott was asked to speak in the final plenary at the World Biosphere Congress in Lima, Peru in 2016 about the role of Indigenous Knowledge Systems in achieving UN Sustainable Development Goals and Biospheres in general. He has also contributed to article 8J Indigenous Facility of the Convention on Biological Diversity. In September 2023,



A warm June sunrise at Hope Bay, long known to Anishinaabe peoples as Nochemoweniing, or "Place of Healing". At the dawn of this new millennium, we know that the future of this area will ultimately depend on how coming generations connect their own well-being to a truly remarkable place - the place we know as the Niagara Escarpment.

Larry McDermott and Jose Barreiro, International Programs Manager of the Americas, Plenty Canada, met with the Canadian Ambassador to Cuba and a Regional Director to UNESCO.

Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat:

The lack of engagement with Indigenous Peoples in effective governance processes from 2017 to early 2019 resulted in a delay of the successes achieved from 2020 to the present. One of the key challenges is establishing trust with Indigenous Peoples of the Biosphere, and a significant obstacle is the often overlooked necessity to develop co-governance capacity in Ethical Space by both rights holders and stakeholders in all Canadian Biospheres. (See Section L and 2.3.5 for further details on Ethical Space.) The evaluation of the Biosphere’s management and coordination under the Commission occurred during the most recent periodic review. Suggestions from the MAB ICC led to consultations for a new Biosphere leader deeply connected to the community. The formation of the Network, shaped by candid discussions and education on genuine engagement with Indigenous Peoples, reflects the voices of both Indigenous and non-Indigenous communities and partners across the Biosphere. This collaborative effort has evolved into a “network of networks”, as an example of appropriate next steps towards effective and efficient co-governance measures.

Main objectives of the Biosphere Reserve:

Describe the main objectives of the biosphere reserve integrating the three functions and the sustainable development objectives for the coming years.

The Biosphere designation was influenced by the vision to reconcile a balance between preservation, conservation, and sustainable development within the Escarpment. This remains the goal of the Biosphere. The Network’s vision statement directly addresses the shared responsibility, for all of those who work, live, and play on the Biosphere, “For all to live in a healthy environment in the lands connected by the Niagara Escarpment where we work together to conserve and protect the land, water and air for diverse resilient ecosystems and the sustainability of our communities.” The Network is underpinned by the need to create and achieve safe Ethical Spaces for Indigenous voices to be heard and to lead the conversation. This resulted in the creation of “Sustaining the Fire of the Network Together”, a record of the Co-Governance

principles that guide the organization to be an inclusive and successful Biosphere organization. (See Section L and 2.3.5 for further details on Ethical Space.)

The main objective of the Biosphere integrates the three functions of conservation, logistical support, and sustainable development. These objectives are designed to harmonize and maintain ecological health, environmental protection, community engagement, and holistic sustainability. In broad terms, the conservation objectives emphasize the preservation, protection, and conservation of diverse ecosystems, landscapes, and habitats, aiming to contribute to biodiversity and maintain ecological integrity through responsible land use and management. The logistical support objectives involve establishing and maintaining resources to support various initiatives, fostering collaboration among rights holders, stakeholders, and partners, while providing logistical assistance for addressing conservation and sustainable development challenges at different levels. The sustainable development objectives focus on promoting practices in harmony with natural law. Economic development and environmental conservation incorporate responsible land use planning and facilitate sustainable resource management in designated areas. Collectively, these objectives align with the overarching goal of achieving a harmonious and sustainable relationship between human activities and the natural environment within the Biosphere.

9. SUPPORTING DOCUMENTS

[List of the annexes submitted with periodic review report.]

(1) Updated location and zonation map with coordinates

[Provide the biosphere reserve's standard geographical coordinates (all projected under WGS 84). Provide a map on a topographic layer of the precise location and delimitation of the three zones of the biosphere reserve (Map(s) shall be provided in both paper and electronic copies). Shapefiles (also in WGS 84 projection system) used to produce the map must also be attached to the electronic copy of the form. If applicable, also provide a link to access this map on the internet (e.g. Google map, website...)]

(2) Updated vegetation map or land cover map

[A vegetation map or land cover map showing the principal habitats and land cover types of the biosphere reserve should be provided, if available.]

(3) Updated list of legal documents

(If possible with English, French or Spanish synthesis of its contents and a translation of its most relevant provisions)

[If applicable update the principal legal documents since the nomination of the biosphere reserve and provide a copy of these documents.]

(4) Updated list of land use and management/cooperation plans

[List existing land use and management/cooperation plans (with dates and reference numbers) for the administrative area(s) included within the biosphere reserve. Provide a copy of these documents. It is recommended to produce an English, French or Spanish synthesis of its contents and a translation of its most relevant provisions.]

(5) Updated species list (to be annexed)

[Provide a list of important species occurring within the proposed biosphere reserve, including common names, wherever possible.]

(6) Updated list of main bibliographic references (to be annexed)

[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve.]

(7) Further supporting documents.

Annex Table of Contents:

Annex I: Academic Citations

Annex II: Municipalities in NEB + Other Legislation, Entities, and Their World Effect Within

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Annex IV: Bruce Trail Land Securement Status

Annex V: Escarpment Biosphere Conservancy Land Securement Summary

Annex VI: Network Communication Plan

Annex VII: Network's Sustaining the Fire Together, Co-Governance Principles

Annex VIII: The NEPOSS Highlights of Achievements from 2012-2023

Annex IX: Commission's Engagement, Education, and Outreach Highlights 2013-2023

Annex X: References

10. ADDRESSES

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