Canadian Water Network

Watershed governance

A selection of case studies for informing integrated watershed management in the Muskoka River watershed.

January 2023 | Full report

Watershed governance: A selection of case studies for informing integrated watershed management in the Muskoka River watershed

Prepared for

Muskoka Watershed Council

Prepared by:

Canadian Water Network

January 2023

Acknowledgement:

This project has received funding support from the Government of Ontario. Such support does not indicate endorsement by the Government of Ontario of the contents of this material.

The authors wish to express a sincere thank you to Drs. Barbara Veale and Dan Shrubsole for their thoughtful review and comments.

Reference:

Hammond, V., & Cooke, S., (2023). Watershed governance: A selection of case studies for informing integrated watershed management in the Muskoka River watershed. Prepared for Muskoka Watershed Council by Canadian Water Network, Waterloo, ON.

Table of contents

List of Figures

List of Tables

List of Appendices

List of Acronyms

CRWR - Coquitlam River Watershed Roundtable
CRT - Community Round Table – Muskoka
CVRD – Cowichan Valley Regional District
CWB – Cowichan Watershed Board
CWN – Canadian Water Network
CWS – Cowichan Water Society
DFO – Department of Fisheries and Oceans (Federal, Canadian)
DMM – District Municipality of Muskoka
EPA – Environmental Protection Agency (US)
ERP - Elizabeth River Project
ENGO – Environmental Nongovernment Organization
FBC – Fraser Basin Council
FTE – Full-time equivalent
FLNRORD - Ministry of Forests Lands Natural Resource Operations and Rural Development (BC)
IWM – Integrated Water Management
JMSB – Joint Municipal Services Board
LTWC - Long Tom Watershed Council
MRA – Muskoka Ratepayers Association
MWAG – Muskoka Watershed Advisory Group
MWC – Muskoka Watershed Council
NGO – Non-government organization
OBWB – Okanagan Basin Water Board
OCA – Ontario Cottagers Association
ONA – Okanagan Nation Alliance
OPCC – Okanagan Pollution Control Council
OWEB - Oregon Watershed Enhancement Board
RAP – Remedial Action Plan
SSEA – Severn Sound Environmental Association
SSSPC - South Georgian Bay-Lake Simcoe Source Protection Committee
SFU – Simon Fraser University
SSIR – Stanford Social Innovation Review
TMDL – Total Maximum Daily Load
UBC – University of British Columbia
UBCO – University of British Columbia - Okanagan
USask – University of Saskatchewan
UVIC – University of Victoria
VDRC – Virginia Department of Recreation and Conservation
VWAC – Virginia Watershed Advisory Committee
WCQI – Water Conservation and Quality Improvement (grant program by OBWB)

Executive Summary

The Muskoka region is a rich, natural area of lakes, waterways, forests and wetlands that are vital to both the quality of life and the economy of the area (MWC, 2020). However, increasing tourism, cottage development, and climate change can significantly impact the communities and ecosystems in this region. As such, there is a need and desire for a more integrated and comprehensive approach to environmental management and land-use planning (MWC, 2020).

Integrated Watershed Management (IWM) is a more comprehensive planning approach and promotes the coordinated development and management of water, land and related resources within the hydrological boundaries of a watershed. The process of IWM strives to consider the local watershed's environmental, social and economic aspects for making land use planning decisions to ensure sustainable development. The Muskoka Watershed Council (MWC) embraces the notion of IWM to avoid these impacts to ensure a healthy Muskoka River watershed for future generations.

The Muskoka Watershed Council was formed in 2001 as a collaboration between the District Municipality of Muskoka and the watershed community. The MWC does not implement any regulations, nor is there long-term sustainable funding for the organization. Over its tenure, however, there has been growing recognition of the value that the MWC provides as an science based advisor for watershed decision making.

This study is partially in response to recommendation 1c of the Muskoka Watershed Advisory Group's recommendation to "undertake a study of different models for watershed-scale governance..." (MWAG, Witzel et al., 2020). Specifically, MWC expressed interest in community-based or 'bottom-up' watershed governance models. As a result, this report summarizes the following:

- A summary of the current context of governance and management of natural resources within the Muskoka River Watershed;
- Six case studies that best describe community-based watershed management; and
- A summary of opportunities and options for the MWC/CRT to consider as they develop an integrated approach to watershed management.

In the absence of an authority responsible for 'governing' all elements within a watershed in the Muskoka Region, communities that desire a 'watershed' or 'ecosystem' approach to planning are left to use more coordination and collaborative mechanisms to align agencies and decision makers toward a shared vision for the watershed. More formal arrangements (e.g., Memorandum of Understanding) or partnership agreements can also support the formalization of collective decision making for a watershed.

Several watershed organizations across North America were identified through a literature review, expert consultation, and key interviews. The six community-based watershed organizations were selected for this study and include two successful municipal service boards (Severn Sound Environmental Association, Ontario, Okanagan Basin Water Board, BC), a water board (Cowichan Watershed Board, BC), a roundtable (Coquitlam River Watershed Roundtable), a council (Long Tom Watershed Council, Oregan, US) and an environmental non-government organization (Elizabeth River Project (ERP), VA, US).

A synthesis of information through literature reviews and interviews for each watershed organization was organized into five categories: 1) Context; 2) Governance; 3) Social Infrastructure; 4) Funding; and 4) Adaptability and Future Challenges. Results present key learnings by considering common elements, strengths, weaknesses, successes, and challenges the organizations experienced. The case studies intend to provide valuable insights for establishing an appropriate governance structure to support IWM in Muskoka.

Key insights from the study are as follows:

- All watershed organizations seized an opportunity presented as a crisis in their community to organize actions in support of their watershed. Problems presented as river pollution, degraded salmon habitat, conflict among resource users, water quality issues (algal blooms) and water supply.
- All of them established a shared vision from which to align efforts, and many of them incorporated guiding principles for collaborating
- Each had a local leader or champion(s)
- In their way, each watershed organization created a continuous and adaptive process using collaboration frameworks
- All maintained integral documents such as a Watershed Plan, a Strategic Plan and a detailed Implementation/Business Plan to guide their work
- Each watershed organization fulfilled the role of convenor, facilitator and neutral integrator
- All recognized that sustainable funding was critical to advance collaborative work
- Each organization was recognized as a credible advisor, no regulatory authority
- Watershed organization staff acted as overall co-ordinators

Ultimately, the case studies did not reveal much difference in organizational structure. However, as Municipal Services Boards, the Okanagan Basin Water Board and the Severn Sound Environmental Association are unique in their ability to obtain a levy to ensure stable funding. Each organization had a director or watershed coordinator and executive, operation, and special project/advisory committees (See Figure ES1). All act in an advisory capacity with no regulatory authority. However, through establishing trust and reputation, they have become a recognized entity in planning and management decision making.

For all of the watershed organizations reviewed, a paid coordinator was considered essential as a convenor in keeping the collaborative process moving, particularly as a communication liaison and coordinating activities such as hosting and facilitating meetings, supporting the development of watershed, strategic and business plans etc. In some cases, organizations with several staff increased their capacity to take on projects and engage with the public. This capacity often reflects whether the Board of Directors was a “working board” or operated as a “governance” board.

Perhaps, most notably, differences among the watershed organizations were noted in their planning and implementation approaches, utilizing collaborative planning models such as collective impact, impact networking and conservation standards practice. These models provide a framework to establish a collective vision of the whole while integrating socioeconomic factors and leveraging all agencies' and organizations' unique strengths and contributions. Using one of these approaches, organizations addressed some common weaknesses in community-led (bottom-up) organizations (e.g., determining

the collective vision, lack of regulatory authority, mobilizing the community, and integrating natural, social and economic concerns).

All organizations cited future challenges that included sustainable funding and independence from government, increasing impacts and complexity associated with climate change and fluctuations in political will and agency/department staff turnover. British Columbia, in particular, is actively seeking alternative funding arrangements for "watershed security" by establishing an endowment that is not tied to the government. Meanwhile, Coquitlam is considering the results of a research paper conducted on their behalf, which examines future potential funding options.

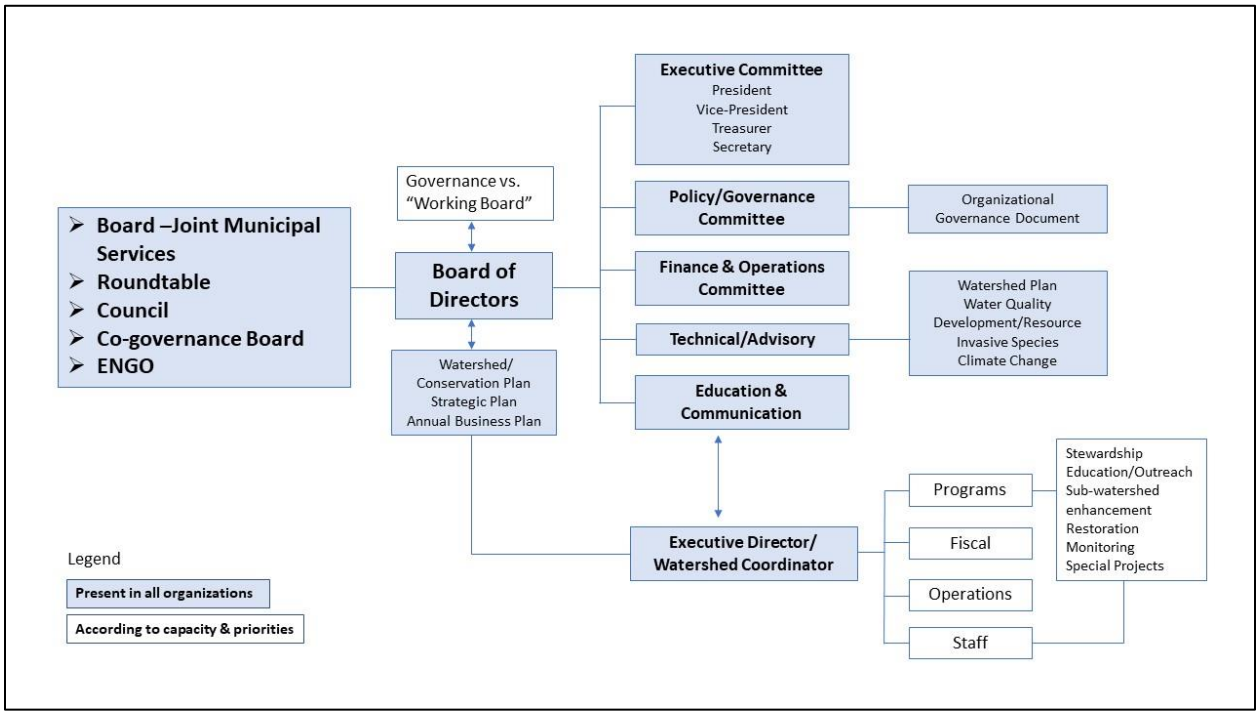

Figure ES1. A generalized organizational governance structure of a community-led organization.

During the research and analysis for this report, several opportunities to build upon or explore in Muskoka became apparent in furthering their development of a community-based governance model in support of more comprehensive watershed planning. Highlights include:

Knowledge Bank

- Numerous reports, including report cards, support the collective understanding of how the Muskoka River watershed works. Build on this information and knowledge
- The District Municipality of Muskoka oversaw the completion of 12 studies for the region; the information and knowledge from these studies represent a strong foundation for continuous learning

- The next steps might be to put the insights from all 12 studies together to understand how the watershed works and identify gaps for further study
- The Muskoka Region, including the DMM, has a broad range of expertise, but many activities are done voluntarily by MWC members. Therefore, relying on only volunteers will limit the speed with which actions are implemented.

Social Capital

- Muskoka Watershed Council has obtained the trust and recognition of their community and is recognized as a strong advocate for the watershed. Therefore, it has an opportunity to continue to build greater clarity and support in the community and create a public/citizen infrastructure/network.
- There are many organizations in the environmental space in the Muskoka region. Clarity of roles and responsibilities could help to focus the MWC further.

Partnerships & Strategic Alliances.

- Numerous community organizations in the Muskoka Region, but there may be an opportunity to clearly define mandates and align actions toward a shared vision and use each organization's strength to advance the health of the Muskoka River watershed,
- Partnering with larger conservation organizations may help build local capacity, and
- Connecting and working with academic researchers can build your collective knowledge of the watershed.

Funding

- Although all organizations actively seek funding, opportunities may include partnering with local charitable organizations for implementing actions,
- An opportunity may be to Investigate establishing a sister charitable organization for fundraising, and
- Establishing an endowment such as what watershed organizations in British Columbia are investigating

Framing Water or Watershed Security

- Framing and communicating watershed health and security as inextricably linked to the natural, social, health, and economic well-being of all citizens may advance the watershed approach to planning,
- Learning from watershed organizations in British Columbia, framing watershed health as a form of security – for social, health and economic prosperity may be an opportunity, and
- Recognizing the need for healthy watersheds to combat the effects of climate change, such as floods and wildfires, may also garner support for growing the capacity of the MWC

Economy

- In Muskoka, the environment is considered the economy – tourism, cottages, outdoor recreation –there may be value in creating more awareness that the health of the region or watersheds is the health of the economy, and

- Reframing the local economy as the 'watershed sector' may help identify, view, and account for the value to local businesses, jobs and tourism, etc., as it stresses its importance to the local economy.

Financial Sustainability.

- Continue to identify and secure, provincial, federal and municipal funding voluntarily through limited and term-based arrangements as a means to start capacity building,
- A municipal services board levy may offer a more long-term sustainable and equitable funding formula.

Role

- The most valued role of the community–led watershed organizations in the case studies was that of convenor and facilitator – an agency that created and supported a collaborative process. MWC could embrace the convenor role to bring together various agencies, partners, etc.
- MWC is already a valued advisor on watershed issues. Maintaining this role will be important

Message

- Consider a phrase or communications campaign that everyone can identify with and rally around (e.g., One Valley, One Water; Share the Resource, Share the Responsibility; Neighbours Working Together for a Healthy Community; The living river with a spirit; Our River Needs you, Do something beautiful).

Over the past 20 years, there has been a deliberate shift to collaborative governance of watersheds across Canada. As a result, watershed organizations are taking a leadership role in their communities to address local issues using a more comprehensive 'watershed approach' to planning. By nature, a more comprehensive approach will require a collaborative approach to bring key stakeholders to the table to identify local actions to address the issues.

It is essential to recognize that working toward IWM is challenging and elusive. The complexity and interaction of natural systems, human impact, climate change and overlapping jurisdictional boundaries are a few of the challenges. IWM is not a final goal to be achieved but rather an ongoing process requiring shared visions, collaboration and communication among many agencies, users and interests within the watershed. It takes time for relationships, trust and collaborative efforts to manifest. Since 2001, the MWC has built a strong foundation on the local knowledge base and social capital for pursuing IWM for the Muskoka. The next steps are to organize and align their assets (e.g., volunteers, relationships etc.), embrace a collaborative framework and pursue the development of a watershed plan with achievable actions in support of IWM.

Introduction

This report provides the Muskoka Watershed Council (MWC) and interested members of the Community Roundtable with a review of approaches used to implement community-based integrated watershed management (IWM). The intent is to

- summarize the current context of the governance and management of the natural resources (i.e., waters, lands and forests) within the Muskoka River watershed from existing reports and interviews with key knowledge holders,
- identify, review and compile case studies that best describe community-based integrated watershed management and capture the key elements of the governance approaches of their successes or challenges that could be applicable to or implemented in the Muskoka River watershed, and
- synthesize and present options for the MWC /CRT to consider as they continue to develop an integrated approach to watershed management for the Muskoka River watershed (chapter 3).

This study is partially in response to recommendation 1c of the Muskoka Watershed Advisory Group (MWAG, Witzel et al., 2020) Report to "undertake a study of different models for watershed-scale governance..." The report starts with a summary of the current watershed governance approach in the Muskoka River watershed and the desire to understand frameworks or models to implement community-led governance models for organizations wishing to implement IWM. The concept of governance and collaborative governance is highlighted along with the notion of top-down or bottom-up approaches for IWM planning.

The report then discusses the concept of IWM. It outlines the elements that underpin integrated watershed management, including managing natural resources at a watershed scale, governance and decision making, and the need for collaboration in the absence of a command-and-control (top-down) approach.

Six case studies are reviewed to highlight key elements that enabled their success. Case studies were selected based on insights from key advisors (Drs. D. Shrubsole and B. Veale) and a scan of the literature for community-led watershed management. Insights from the case studies are summarized, followed by a discussion highlighting the key elements required to move from the concept of IWM to implementation. A final summary is provided for the MWC to consider as they move toward a more integrated and holistic approach to watershed management.

Muskoka River Watershed

The Muskoka River watershed is located on the eastern side of Georgian Bay and is divided into three main drainage areas - the North Branch, South Branch and Lower Muskoka. The headwaters start on the western slopes of Algonquin Park and flows southwest to Lake Muskoka. The Lower Muskoka subwatershed covers approximately the western one-third of the watershed and receives inflow from the North and South Branches, Lakes Joseph and Rosseau. The combined flow passes through the Moon and Musquash Rivers and discharges into Georgian Bay. The Muskoka River drains about 5,100 square

kilometres (MWC, nd). For a more detailed description of the watershed, see Sale et al., (2020) and Cragg, (2020).

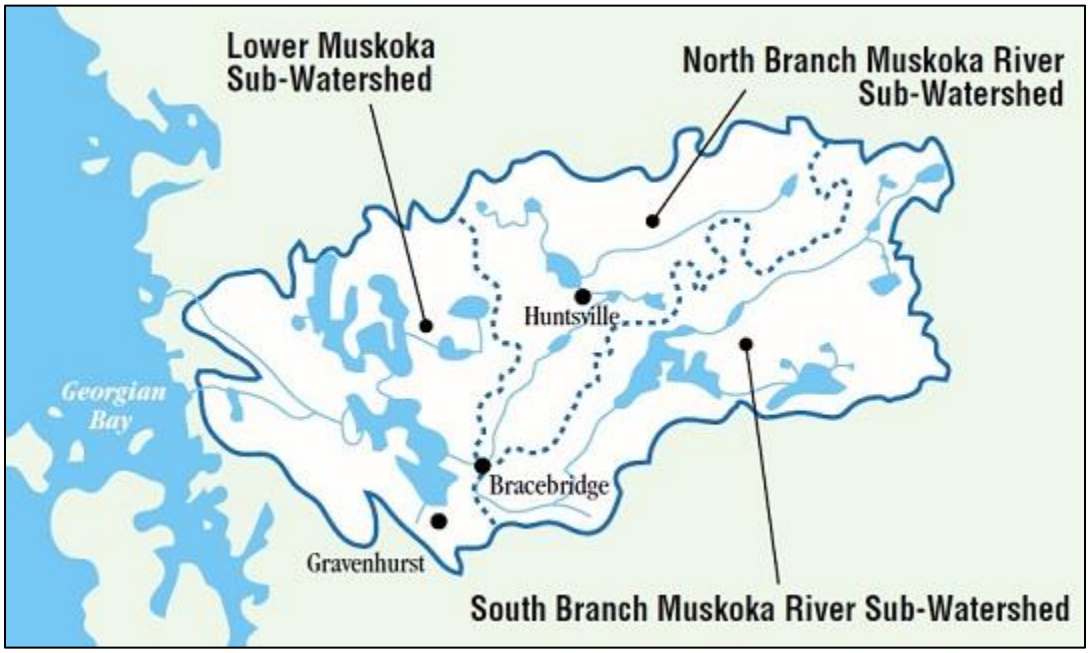

Figure 1. Muskoka River Watershed (MWC, nd).

Watershed governance in the Muskoka River watershed

Witzel et al. (2020) point out that watershed governance in Muskoka is not an issue of a lack of governance but rather one of too many governors. The current decision-making approach is fragmented and distributed among lower and upper-tier municipalities and the provincial government. First Nations and the federal government also play a role in the Region. They emphasize that no one body provides comprehensive oversight or leadership for the watershed.

The natural environment in Muskoka underpins its economic vitality. Many permanent residents and seasonal homeowners in the region value the environment deeply to live, work and play. Given the perceived 'pristine' condition of the environment in the Muskoka area, the general public may lack understanding of watershed issues except for flooding. Recent flood events experienced in 2019 have brought the fragmented approach to the management of the environment to the forefront.

However, given the deep value of the natural resources in the Muskoka River watershed and the desire for integrated management, knowledge and understanding of the environmental issues represent a mechanism to coalesce support to develop a shared sense of the importance of managing the natural resources of the area. Shared learning is an important activity to grow understanding across the area. Witzel et al. (2020) highlighted the increased incidence, severity and risk of flooding, erosion and siltation, existing and emerging threats to water quality, and existing and emerging threats to biodiversity and natural habitat. For this study, we interviewed Muskoka Watershed Council members who highlighted flooding, lake and river quality, forest health and a changing climate as critical concerns

for the watershed. These environmental issues will drive the work required to integrate the planning approaches toward a shared vision for the Muskoka River watershed.

Witzel et al. (2020) also highlight the lack of coordination/collaboration, consistency, leadership (i.e., quarterback), clear communication, tools and information, and expertise to deal with watershed-based issues. These are critical elements required for achieving an integrated or watershed approach to managing the natural resources of the Muskoka River watershed. In addition, transparency, knowledge sharing, and trust building are also critical elements that must be part of a collaborative governance approach in support of integrated planning.

Box 1 - Watershed approach | Integrated Watershed Management | Ecosystem Approach

A watershed approach is a concept that implies the geographical unit for land and water planning. Veale (2010) points out that a ***watershed approach*** borrows from the ecosystem approach and is also closely aligned with sustainability and good governance principles. In addition, this approach (1) embraces principles that have an express focus on the watershed and collaborative decision-making processes, (2) supports a 'bottom-up' or 'grassroots' approach, and (3) tends to be more strategic and reduced in scope, more action-oriented, and more adaptive than the traditional 'top-down' approach (Born and Genskow 1999).

Integrated Watershed Management (IWM) is considered to be a subset or derivative of ***Integrated Water Resources Management*** (IWRM), which implies implementation at a watershed scale (Veale 2010)

An ***ecosystem approach*** is defined by the Convention on Biological Diversity COP 5 as a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

Federal and provincial governments

Federal government responsibilities relate to several specific matters, including national parks, First Nations reserves, and other federal lands; fish and fish habitat; navigable waters; and waters that flow across provincial/territorial boundaries and the international boundary between Canada and the United States (Simms and de Loë, 2010).

Federal and Provincial governments in Canada have water-related responsibilities under Canada's constitution (Saunders and Wenig, 2006). Generally, water bodies within a province are governed by provincial governments.

The Provincial government oversees an overarching framework for the management of water and natural resources management through legislation, regulations and agreements. There are several ministries that 'touch' many of the elements considered to be part of an integrated approach to watershed management. However, much of the local planning, implementation and management is delegated to municipalities.

In the case of the Muskoka River watershed, the provincial and federal governments do have a role to play. However, they tend to be site-specific, issue-specific or regarding specific legislation requiring compliance (e.g., Environmental Protection Act).

Municipal governments

Although municipalities have specific water-related responsibilities under provincial statutes, they do not have constitutionally-defined authority (Simms and de Loë, 2010).

As described in the Muskoka River Water Management Plan (2006, amended 2019), the Muskoka River watershed crosses three districts, one county, 13 geographic townships and Algonquin Park. About 75% of the watershed is in the District Municipality of Muskoka. About 15% of the watershed is within the District of Nippissing (Algonquin Park) and contains the headwaters of the Muskoka River's North Branch and South Branch. Consequently, many municipal actors could be involved in making decisions impacting the Muskoka River watershed.

The District Municipality of Muskoka (DMM) has taken on a coordinating role for their lower-tier municipalities, but a mechanism is needed to onboard those municipalities that are part of the watershed yet beyond the DMM's borders.

This report does not provide an exhaustive review of the land-use, decision-making process within the municipalities of the Muskoka River watershed, as this is done elsewhere, e.g., Existing Conditions Land Use Policy Review (Meridian Planning, 2022). However, it is evident that the District Municipality of Muskoka currently takes a leadership role in matters associated with the Muskoka River, mainly because greater than 75% of the watershed lies within the municipality. The DMM has staff who provide in-kind support for the MWC and other watershed-related planning initiatives and undertakes a coordinating role for their six lower-tier municipalities. It is recognized that a mechanism is needed to onboard those municipalities that are part of the watershed yet beyond the DMM's boundaries.

Muskoka Watershed Council

The Muskoka Heritage Foundation and the District Municipality of Muskoka (DMM), created the Muskoka Watershed Council in 2001. It existed as an unincorporated body until 2019 when it was incorporated as a not-for-profit in Ontario. It is not a regulatory or enforcement agency. Still, it provides evidence-based advice and recommendations to municipal governments, decision-makers, managers and the general public on ways to protect and restore the resources of the area’s watersheds (DMM, 2003).

The purpose of the Council is to share resources, identify environmental issues, help address watershed management issues, provide a framework for coordination and cooperation among key interests and report on the watershed's health regularly.

Since the conception of the MWC, there has been growing recognition of the value that the MWC provides to the watershed. Since the beginning, two municipalities outside the DMM (Seguin and Algonquin Highlands) have been represented on the MWC. More recently, in pursuit of IWM, the MWC board members have expressed a desire for more coordination and collaboration among all

municipalities within the Muskoka River watershed. This illustrates a desire to realize more outcomes based on **collective actions** toward a common goal.

The following highlights the initial terms and conditions outlined in the "Operating Procedures" (MWC 2003, amended 2016):

> The Muskoka Watershed Council's (MWC) mission is to champion watershed health.
>
> The DMM provides part-time staff resources, and the Council comprises members of the community-at-large, together with elected appointees from each area municipality (DMM, 2003).
>
> MWC is an advisory body and not a regulatory or enforcement agency. It provides evidence-based (or science-based) recommendations to decision-makers, such as municipal governments and the general public, on protecting and restoring the resources of the area's watersheds.
>
> MWC was formed to share resources, help address watershed management issues, provide a framework for coordination and cooperation among key interests, and report on the watershed's health regularly.
>
> MWC undertakes many outreach and stewardship programs and citizen science to foster education on environmental management.
>
> MWC strives to provide a framework for coordination and cooperation and prefers to use consensus as its decision-making process.
>
> MWC represents key interests and stakeholders across Muskoka's watersheds, ensuring a comprehensive look at watershed issues. MWC members also regularly communicate with other groups and individuals, forming a broader network of watershed stakeholders.
>
> Community representation is from a broad range of communities of interest across the watershed.
>
> Decision making by the Council is through consensus building; however, the MWC remains an advisory body to established decision-making bodies and communities of interest.

The Muskoka Watershed Council was formed in 2001 as a collaboration between the District Municipality of Muskoka and the watershed community. There are no regulations to implement or funding for the organization. The Council acts as a voluntary policy adviser and currently receives only project-specific funding if available. The DMM provides staff in-kind to support watershed-based initiatives (K. Trimble pers. comm.). A small annual operations budget of $6,000 is provided by the DMM in addition to the in-kind support. Occasionally, other municipalities provide nominal funds to support specific projects like the production of watershed report cards.

The Muskoka Watershed Council gained not-for-profit status (K. Trimble, pers. comm.) in 2019 and continues to act in an advisory capacity to local municipalities concerning Official Plans. Its current mission remains to champion watershed health (Muskoka Watershed Council, n.d.). Interviews with key members of the MWC shared that their advisory role and the work they have completed is well received and appreciated by the local municipalities and interested stakeholders.

The Muskoka Watershed Council has 29 active members, including eight who are appointed from municipal councils. Members commit to a two-year renewable term. It has a nine-member Board of Directors. Most of the work is don't through subcommittee which generally include Board members as participants (Muskoka Watershed Council, n.d.).

In addition to the Muskoka Watershed Council, there are many other organizations and initiatives undertaking environmental and conservation activities. The following highlights some of these initiatives and organizations:

Projects and initiatives relevant to the MWC

Over the last four years, two initiatives were initiated that directly relate to the interests of the MWC. These include the Muskoka Watershed Advisory Group and the Community Roundtable.

Muskoka Watershed Advisory Group

In 2018, the Province of Ontario announced the creation of the *Muskoka Watershed Conservation and Management Initiative* to identify risks and issues facing the Muskoka region (Witzel et al., 2020).

The Muskoka Watershed Advisory Group (MWAG) was established in 2019 as an advisory group to the Minister of Environment Conservation and Parks. Their role was to advise the Ministry regarding the important local issues in the Muskoka region and the types of projects that could help address the issues. A key recommendation was the need for IWM in the Muskoka River watershed.

For all intent and purpose, this Advisory Group has fulfilled its terms of reference and is no longer active. A number of its members were also active in the Muskoka Watershed Council and remain so.

Community Roundtable

The Community Roundtable (CRT), is a project recommended by MWAG as a forum for representatives of all sectors in the Muskoka River watershed to share perspectives, knowledge and experience to recommend a design for Integrated Watershed Management (IWM).

The CRT was formed by MWC, at the request of the DMM in 2021, to support the initiative "Making Waves: Integrated Watershed Management," as a mechanism to consult with a broader community to provide feedback to the DMM on 12 technical projects funded by the province. The CRT was also seen as a means for monitoring the implementation of IWM.

Approximately 25 people sit at the CRT. They include MWC members, representatives from municipalities with lands within the Muskoka River watershed, and members drawn from various business interests, organizations, and communities across the watershed (Integrated Watershed Management, Muskoka Watershed Council, n.d.)

Currently, the CRT has drafted a vision, mission, goals and interim objectives and a membership model (Integrated Watershed Management, Muskoka Watershed Council, n.d.).

The CRT is not a legally binding entity, (e.g., not-for-profit), but rather an initiative recommended by the DMM and hosted by the MWC.

Other Players influencing decision making in the Muskoka River watershed

Many other organized players in the Muskoka area have various mandates and undertake multiple activities supporting a healthy Muskoka Region. A few include:

Friends of the Muskoka Watershed is a charitable organization that engages Muskoka residents in citizen science projects, ASHMuskoka and road salt. Funding is through memberships, grants and donations.

Land Trusts - Muskoka Conservancy is a charitable organization whose mission is conservation, education, stewardship and land securement to safeguard natural areas in the Muskoka region. The **Georgian Bay Land Trust** is a similar organization with a different geographical area, serving the Georgian Bay archipelago.

Muskoka Community Land Trust is a community-led, non-profit organization which acquires and holds such lands as agricultural, civic and community housing land for the benefit of Muskoka.

The Federation of Ontario Cottagers Association (FOCA), is quite active in the Muskoka area and there are several **Cottage or Lake Associations,** such as the Muskoka Lakes Association, whose work focuses on relevant local issues such as water quality, responsible government and fair taxation, responsible land use, and other important issues in Muskoka. Some Lake Associations also comment on or develop lake Plans.

Waterpower producers – partnership with MNRF on the Muskoka River Water Management Plan.

Property Associations such as the Muskoka Bay Property Owners Association and the Muskoka Ratepayers Association (Township of Muskoka Lakes).

Environmental NGOs such as Algonquin Ecowatch or Friends of Algonquin Park.

Academic researchers are pipelines for local science and technical knowledge in support of decision making. Currently, there is the Dorset Environmental Science Centre. A collaborative established to leverage research funding through Canadian Water Network from 2012-15 saw many researchers from the universities of Trent, York, Nipissing, Carleton and Waterloo, alongside Ministry of Environment staff, evaluate cumulative effects in the Muskoka Watershed (Eimers, 2016).

Georgian Bay Biosphere Reserve (GBBR) is a non-profit registered Canadian charity governed by a Board of Directors with an administrative office located in Parry Sound, Ontario, Canada whose mission is to “nurture a balance between humans and nature in the Georgian Bay Biosphere region.” (Our organization, Georgian Bay Biosphere Reserve, n.d.).

Further, as part of the Community Roundtable, several sectors were identified as having some connection to the Muskoka River watershed. Table 1 lists these sectors.

Since 2019, there has been growing interest for representation on the Muskoka Watershed Council from municipalities that are outside the DMM to ensure consistency of land use decisions in support of a

'watershed approach' to managing the highly valued resources of the area. This illustrates a desire to realize more outcomes based on aligning actions to achieve a common or shared goal.

Table 1. Important sectors in the Muskoka River watershed as identified by members of the Community Round Table.

- Forestry
- Algonquin Park
- Rural/agricultural community
- Tourism Recreation (sledding, paddling, hiking)
- Lake Associations
- Construction – infrastructure
- Construction – home & cottage
- Real Estate
- Waterpower producers
- Municipal/provincial Indigenous
- General Community
- Development
- Environment (Friends of the Muskoka River, Muskoka Conservancy, Georgian Bay Biosphere Reserve, tech specialists)
- Chambers of Commerce/general business

The concept of watershed governance

Governance refers to the processes that are established or in place to make decisions. The decisions are generally matched to political boundaries such as a municipality or Province.

Watershed governance can be described as the processes in place to make decisions within the geographic scale of a catchment or watershed. A watershed is an area delineated by topography where all precipitation drains to one point or outlet. Watersheds can be as small as a few farm fields, as large as trans-provincial (McKenzie River) or national (e.g., Great Lakes). Many generally perceive governance to be the role of governments (Sims and de Loë, 2010). Still, it is inherently challenging when considering the scale of watersheds, as governance mechanisms generally do not conform to geographic boundaries and instead follow political boundaries.

Watershed governance is complex and challenging as it attempts to bring together social (e.g., uses and values of the natural resources), environmental (e.g., water, forests etc.) and economic (e.g., jobs and employment) elements within a decision-making process and framework. Due to its complexity and the wide range of actors involved, watershed governance is collaborative and focused on the issues relevant to the watershed. Because of this complexity, there are only a few organizations world-wide with complete authority over water and natural resources within the scale of a watershed (Murray-Darling River Basin, governed by the federal government but through legislation enabled a coordinating body for overseeing water allocation issues (Eberhard et al., 2017).

In the absence of an authority responsible for 'governing' all elements within a watershed, communities that desire a *watershed or ecosystem approach* to planning are left to use more coordination and collaborative mechanisms to align agencies and decision-makers toward a common vision for the watershed. More formal arrangements (e.g., Memorandum of Understanding) or partnership agreements can also support the formalization of collective decision making for a watershed.

The concept of collaborative governance

Collaborative governance is decision making and management that engages people constructively across the boundaries of public agencies, levels of government, and the public to carry out a public purpose that could not otherwise be accomplished (Emerson et al., 2011). More simply, collaborative governance is a process where partners representing different interests make decisions together, share resources and strategically align to solve problems (Weaver, 2021). The most important element of collaborative governance is the *people process* and the mechanisms to build and maintain key relationships and trust among influencers and decision-makers.

Implementing collaborative governance requires a people-centric approach with a balance between established processes and a product or outcome (adapted from Weaver, 2021). An initiative should be defined enough so that those involved know the overall organizing structure, their roles and responsibilities and what they are accountable for in the initiative. People should also know how they contribute to achieving the shared outcomes, how decisions are made, and the overarching goals of the initiative. Equally as important is a firm understanding of the relationships, connections, and trust between partners (Weaver, 2021).

Collaboration among various 'actors' or organizations is not a new concept. There are many collaboration frameworks, such as co-management, multi-sectoral arrangements, partnerships or networks, as highlighted in Emerson et al. (2011), Biddle (2011) and Imperial (2005). Community-led collaborative efforts are often described as "bottom-up" in that it involves local stakeholders coming together to address problems of local interest (Koontz and Newig, 2014). This contrasts with top-down approaches where an overarching agency with ‘experts’ is responsible for all resource management decisions.

Collaborative approaches to addressing environmental problems are becoming more common (Koontz and Newig, 2014). Simms and de Loë (2010) share that a command-and-control or top-down approach is/has changed in Canada. Even in 2010, they remark that there has been a clear shift toward new approaches to governing water(sheds) that includes the use of multi-sector, collaborative approaches that bring together many actors to share information and resources and work together on common problems or toward common goals. Collaborative efforts are often described as “bottom-up” or community-led in that they engage stakeholders in a local area to address problems of local interest (Koontz and Newig, 2014).

Most of the community-led collaborative approaches attempt to accomplish a shared sense of ownership of the work required to implement actions to create the desired change. For instance, a communications campaign used in collaborative water management planning for the Grand River watershed in the early 1990s was "*share the resource; share the responsibility*" (Veale and Cooke, 2016). This campaign (and branding) exemplified the philosophy that everyone sharing the resource of the watershed should be part of the cooperative effort to conserve, interpret and enhance river-related heritage resources. By sharing the responsibility over multiple organizations and agencies, there is a sense of shared sense of ownership or buy-in to help solve problems that no one organization can do alone.

Governance arrangements, or how various actors organize themselves to undertake collective action, depend on the local context and those participating in the collaboration. As Eberhard et al. (2017) point

out, networks (or collaboratives) can be governed by the members themselves (participant governed), coordinated through a single participating member (lead organization governed), or led by an entity specifically created to support a collaborative approach (network administrative governed). Regardless, someone or a group will need to support the activities in support of collaboration.

Sharing responsibility means sharing the decision making. Collaborative governance is the processes and structures of decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and the public, private and civic spheres to carry out a public purpose that could not otherwise be accomplished (Emerson et al., 2011). It is often used interchangeably with terms such as "co-management" or "partnerships," where diverse actors work together or cooperate under different degrees of formality and power-sharing (Simms and de Loë, 2010). Co-management, partnerships or collaborative governance provides the mechanism to address environmental problems by acknowledging the interrelationships of ecological systems and the institutions that govern those systems (Imperial, 2005; Simms and de Loë, 2010). Fundamentally, it is a process that brings people together to engage in consensus-oriented decision making.

One of the biggest challenges in successful watershed management is building processes that are collaborative yet streamlined to match stakeholder capacity and sustain interest and enthusiasm over the long term (Veale and Cooke, 2017). Also, managing collaborative processes requires professional skills, such as good interpersonal, negotiation and facilitation skills to resolve disputes, broker agreements and build consensus. Political acuity is necessary to avoid conflicts, and finally, leadership and persuasion skills were also identified as essential skills to coalesce participants toward common goals (Imperial & Hennessey, 2000). Consequently, developing an umbrella organization (e.g., watershed council, basin organization etc.), that supports a collaborative watershed planning decision-making process that is inclusive, yet focused on achieving shared goals, can be challenging. For community-led approaches, the local context (e.g., actors and watershed issues) drives who is at the table and the focus of the planning.

The concept of integrated watershed management

There are many definitions of integrated watershed management. One that many scholars reference is by the Global Water Partnership (2000). They defined *Integrated Watershed Management* (IWM), as a process which promotes the coordinated development and management of water, land and related resources to maximize the resultant economic and social welfare, paving the way toward sustainable development equitably, without compromising the sustainability of vital ecosystems. Many interchange the term Integrated Water Resources Management (IWRM) with IWM. More simply, it is the protection and restoration of water and land resources within a watershed to sustain human well-being (B. Veale, pers. comm.).

Implementing IWM requires the coordination or 'linking of' environmental, social and economic decisions and activities through an inclusive decision-making process to manage the protection, conservation, restoration and enhancement of aquatic and terrestrial ecosystem features, functions and linkages (CCME, 2016). For some time, academics have debated whether it is a way to deal with complex, multi-agency, multi-sector, 'wicked' challenges. Mitchell (2009), emphasizes that IWM is a *means to an end* and that it is important to have a clear vision of the desired end state for a catchment or river basin.

Integrated watershed management is not a panacea to solve all natural resource management problems but rather a collaborative process to continuously improve a watershed's health over time. Watson et al., 2019, cautioned that the globalization of IWRM as an idea or ambition is that various major international organizations have produced guidelines or a recipe. This can create a false impression that IWM/IWRM is a relatively straightforward approach that can be applied and transferred in a blueprint and sequential fashion. Although likely helpful to the practitioner, guidelines might assist to help 'guide' the elements needed to undertake IWM; however, local context (e.g., socio-political, environmental, economic) is critical to developing mechanisms that support collaboration among the local actors and organizations. These mechanisms should consider the relationships among multiple actors, the cross-scale nature of decision making, efforts to improve coordination, and capacities for resolving problems (Watson et al., 2019).

There are several challenges identified for implementing IWM or IWRM. The following highlights some of the challenges of IWM as identified by Veale (2010), Butterworth et al., (2010), Dietz et al., (2003) and Sherman et al., (2018):

1. IWM is too idealistic, the concept is vague, people have a hard time understanding it and thus, it is routinely dismissed as jargon
2. Local context is required to inform the process and therefore a top-down driven approach will not have sufficient buy-in and that IWM is not people-centred enough
3. Institutional arrangements are too rigid, and staff tend to “stick to their lane”
4. Top-down approaches give little regard for the capacity needed at the local level (i.e., watershed organization) to support the ‘integration’ or collaboration
5. Investments and efforts in IWM typically do not build on existing administrative and institutional arrangements
6. IWM is applied at inappropriate scales without sufficient data to understand the overriding resource issues
7. The scale at which policy making takes place is mismatched with the scale at which implementation occurs
8. Participation strategies fail to consider the inequities in stakeholder information, lack of integration by private land interests and municipalities, power, and influence, resulting in tokenism, patronization, or disenfranchisement of certain citizens (e.g., minorities, financially disadvantaged), and developing comprehensive approaches to participation takes considerable time, and
9. IWM fails to recognize water politics as a reality

These challenges do not preclude using the notion of IWM, just that these challenges should be considered when designing appropriate governance, collaboration and engagement processes. Moving from concept to implementation is the real challenge for organizations desiring a watershed or ecosystem.

Butterworth et al., (2010) suggest that IWRM implementation tends to start from the idea that there is a need for one super-agency to be responsible for all decisions and actions which is reflective of a top-down approach for natural resources planning and implementation. With only a few exceptions, a super-agency approach does not exist and therefore, IWRM is more about finding ways to coordinate and address coordination challenges. They continue to suggest that while embracing IWRM as a

principle, practitioners should focus on the more local level, as opposed to the river basin or larger scale, seeking integration *within* sectors as opposed to establishing intersectoral mechanisms and building upon existing institutions and participation mechanisms as opposed to establishing new multi-sectoral institutions. In other words, start small and focused using the local context of the natural resource issues and decision-makers and iterate to include more elements of IWM and actors over time.

Implementing IWM is challenging and requires patience, perseverance and leadership; it also requires a long-term institutional commitment from all partners (Veale and Cooke, 2016). It is a process supported by a neutral integrator, or umbrella organization, for bringing the local watershed's environmental, social and economic aspects together to ensure consistency and inform decision making on behalf of the watershed. Finally, it requires a collaborative watershed governance process.

The following section reviews six watershed organizations from Canada and the United States, demonstrating a community-led watershed approach to local natural resource issues. These case studies will provide insight into what has worked for their geographic area, given the local geopolitical context of natural resource issues and the key decision-makers in their regions. For each case study, the local context will be summarized along with the watershed organization's structure and governance approach. We will examine the social infrastructure, such as human capacity, trust, cooperation and collaboration and the financial capacity of each organization. Each case study will finish by considering adaptability, limitations and future challenges.

Introduction References

Biddle, J. (2011). Does collaborative governance lead to environmental improvements? The critical elements affecting watershed partnerships' capacity to achieve their goals. [Unpublished doctoral dissertation]. George Mason University, Virginia, USA.

Born, S.M., & Genskow, K.D. (1999). Exploring the Watershed Approach: Critical Dimensions of State-Local Partnerships: The Four Corners Watershed Innovators Initiative River Network. 61 pp. https://dpla.wisc.edu/wp-content/uploads/sites/1021/2017/06/watersheds4corners-1999.pdf

Butterworth, J., Warner, J., Moriarty, P., Smits, S., & Batchelor, C. (2010). Finding practical approaches to Integrated Water Resources Management. Water Alternatives 3(1): 68-8

Canadian Council of Ministers of the Environment (CCME). (2016). Summary of integrated watershed management approaches across Canada. PN 1559 ISBN 978-1-77202-034-2 PDF

Dietz, T., Ostrom, E., & Stern, P. C. (2003). The Struggle to Govern the Commons. Science, 302(5652), 1907–1912. https://doi.org/10.1126/science.1091015

Eberhard, R., Margerum, R., Vella, K., Mayere, S., & Taylor, B. (2017). The Practice of Water Policy Governance Networks: An International Comparative Case Study Analysis. Society & Natural Resources, 30(4), 453–470. https://doi.org/10.1080/08941920.2016.1272728

Eimers, C. (2016). Cumulative effects assessment and monitoring in the Muskoka Watershed. Report for Canadian Water Network, Waterloo, Ontario. 11p. https://cwn-rce.ca/wp-content/uploads/2013/12/CWN-EN-Muskoka-2016-Web.pdf

Emerson, K., Nabatchi, T., & Balogh, S. (2011). An Integrative Framework for Collaborative Governance. Journal of Public Administration Research and Theory, 22(1), 1–29. https://doi.org/10.1093/jopart/mur011

Georgian Bay Biosphere Reserve. (n.d.) *Our organization.* https://www.gbbr.ca/our-organization/

Global Water Partnership Technical Advisory Committee. (2000). Integrated water resources management. TAC Background Papers no. 4. Stockholm: Global Water Partnership.

Imperial, M.T., & Hennessey, T. (2000). Environmental Governance in Watersheds: The Role of Collaboration. Prepared for presentation at the 8th Biennial Conference of the International Association for the Study of Common Property (IASCP) May 31 – June 3, 2000, Bloomington, IN

Imperial, M. T. (2005). Using Collaboration as a Governance Strategy: Lessons From Six Watershed Management Programs. Administration & Society, 37(3), 281–320.

Koontz, T. M., & Newig, J. (2014). From Planning to Implementation: Top-Down and Bottom-Up Approaches for Collaborative Watershed Management. The Policy Studies Journal, 42(3): 416-442.

Mitchell, B. (2009). IWRM In Practice: Lessons From Canadian Experiences. Journal of Contemporary Water Research & Education, 135(1), 51–55. https://doi.org/10.1111/j.1936-704x.2006.mp135001006.x

Muskoka River Water Management Plan. Final Plan Report (amended December 2019). Prepared by the Ministry of Natural Resources, Ontario Power Generation, Orillia Power, Bracebridge Generation, and Algonquin Power. http://www.muskokawaterweb.ca/water-101/water-quantity/mrwmp

Muskoka Watershed Council (n.d.) Council and Committees. https://www.muskokawatershed.org/about-us/council-committees/

Muskoka Watershed Council. (n.d.) *Integrated Watershed Management* https://www.muskokawamdtershed.org/programs/integrated-watershed-management/

Muskoka Watershed Council (n.d.) Mission and Objectives. https://www.muskokawatershed.org/about-us/mission/

Muskoka Watershed Council. n.d. Muskoka Watershed Council. https://www.muskokawatershed.org/about-us/council-committees/muskoka-watershed-council/

Muskoka Watershed Council (n.d.) Muskoka Watershed River. https://www.muskokawatershed.org/watersheds/muskoka-river-watershed/

Muskoka Watershed Council. (n.d.) Operating Procedures. https://www.muskokawatershed.org/wp-content/uploads/OperatingProcedures-Oct2016-2.pdf

Sale, P., Trimble, K., Lammers, R., Doyle, C., Ross, G., Yan, N., & Arney, P. (2020). The Case for Integrated Watershed Management in Muskoka. A Report from the Muskoka Watershed Council. Muskoka Watershed Council, Muskoka, Canada, 25 pages.

Saunders, J. O. & Wenig, M. (2006). Whose water? Canadian water management and the challenges of jurisdictional fragmentation. In Eau Canada: The Future of Canada's Water, ed. K. Bakker, 119-141. Vancouver: University of British Columbia Press.

Sherman, K., Whittam, R., & Cayley, J. (2018). Severn Sound Remedial Action Plan: The friendly little monster. Aquatic Ecosystem Health & Management 21 (4): 387–397. doi: https://doi.org/10.1080/14634988.2018.1528819

Simms, G. & de Loë, R.C. (2010). Challenges for Water Governance in Canada: A Discussion Paper. Governance for Source Water Protection in Canada Report No. 2. Waterloo, ON: Water Policy and Governance Group

The District Municipality of Muskoka. (2003, as amended in 2016). Operating Procedures. Prepared for the Muskoka Watershed Council. https://www.muskokawatershed.org/wp-content/uploads/OperatingProcedures-Oct2016-2.pdf

The District Municipality of Muskoka. (2018). 2017 Second Home Study. https://muskoka.civicweb.net/document/31559/

The District Municipality of Muskoka. (2019). Muskoka. Let Us Show You Why. https://www.muskoka.on.ca/en/finance-and-administration/resources/Documents/DMM-Economic-Development-Profile---Website-File-Size.pdf

Veale, B. (2010). Assessing the influence and effectiveness of watershed report cards on watershed management: A study of watershed organizations in Canada. (unpublished doctoral dissertation). Waterloo: University of Waterloo, Department of Geography.

Veale, B., & Cooke, S. (2016). Implementing integrated water management: illustrations from the Grand River watershed. International Journal of Water Resources Development, 1–18. https://doi.org/10.1080/07900627.2016.1217503

Watson, N., Shrubsole, D., & Mitchel, B. (2019) Governance Arrangements for Integrated Water Resources Management in Ontario, Canada, and Oregon, USA: Evolution and Lessons. *Water* 11(4):663. https://doi.org/10.3390/w11040663

Weaver, L. (2021). Solving the puzzle of collaborative governance. Tamarack Institute, Waterloo, ON 7p. https://www.tamarackcommunity.ca/library/solving-the-puzzle-of-collaborative-governance?hsLang=en-us

Witzel, M., Smith, D., Arney, P., Beaucage, J., Cayley, J., Cragg, C., Miller, J., Trimble, K., & Yan, N. (2020). Report of the Muskoka Watershed Advisory Group (MWAG): Interim advice and recommendations to address priority environmental issues in the Muskoka River watershed. Report prepared for The Honourable Jeff Yurek, Minister of the Environment, Conservation and Parks.

Community-led organizations in watershed management – A selection of case studies

Getting Started – Research

To fully understand the context and current needs for IWM in Muskoka, several interviews were conducted with local representatives, including members of the Muskoka Watershed Council (MWC), Community Round Table (CRT), District of Muskoka (DMM) staff, local councillors and lake association residents (Appendix A). In addition, researchers attended various meetings held by the MWC and CRT. Key documents were sourced on the MWC website or shared directly by council members.

A recent publication, "Integrated Water Management in Canada: The Experience of Watershed Agencies" (Shrubsole et al., eds., 2018), was used as a foundational starting point for this investigation, as it provided a compendium of IWM in Canadian watershed agencies. Further, Dan Shrubsole (Associate Dean and Professor of Geography and Environment, Western) and Barbara Veale (Senior Director, Watershed Strategies and Climate Change at Conservation Halton), both editors on this publication, were contacted to ask, where in their experience, leading examples in IWM in *community-led watershed organizations* might be located. The response was British Columbia and Quebec.

Further, an online web search and academic literature search revealed several case study possibilities, primarily in British Columbia and the United States (Appendix B). Inquiry interviews were held with people working in water resources management in British Columbia (both within and outside government), for their guidance in community-driven watershed management organizations that are at the forefront. Contact was made with Quebec as well to source key documents, although due to the language barrier and staff availability, an interview was not possible.

Certainly, there are many examples of IMW internationally. In particular, New Zealand and Australia provide exemplars. However, these were excluded from this review for several reasons: significant differences in government structures, enabling legislation and ultimately, much exists already in the literature to consult if desired.

Community-led organizations – Selection and considerations

There are many types of river basin organizations and a range of top-down, bottom-up, or some combination of frameworks that exist: advisory committees, authorities, commissions, councils, roundtables, etc. (Appendix C). Types of community-led watershed organizations relevant to this review are listed in Table 2 and are compiled primarily from Hooper (2005) and Coquitlam River Watershed Roundtable (2010).

With a focus on community-led organizations, the case studies selected are shown in Table 3. While there may be differences in watershed size, characteristics and drivers, the cases represent the closest approximation of conditions, particularly surrounding the need and desire for local and community-driven watershed management. One exception is the Elizabeth River Project. This watershed is atypical to those being considered. However, its strength as a model of *Collective Impact* is worth consideration. *Collective impact* describes an intentional way of collaborating or working together and sharing

information for the purpose of solving complex problems (Kania & Kramer, 2011). Examples excluded from the study were deemed too different in federal, provincial/state government structure and legislation; topography (e.g., mountainous, coastline); the size of the watershed (i.e., too large/small); population (e.g., too sparse or too heavily populated); etc. (Appendix B). Through careful consideration, the selected cases represent different arrangements in structure, governance, community engagement and funding to offer insights.

Table 2. Types of community lead watershed organizations and their descriptions from Hooper (2005)

Governance Structure	Description
Council	A watershed council is a grass-roots organization dedicated to helping local communities to identify natural resource issues in their local area and to implement voluntary, collaborative solutions to issues. Councils may include government representatives and may be legislated.
Board	A Board may be similar to commissions and in an advisory/education, monitoring or regulatory role in fulfilling agreements. At times, they may develop or enforce policies outlined by government;
Municipal Services Board	A Municipal Services Board is a local multi-municipal body that manages and delivers services such as a library, transportation, police services, board of health, across many municipalities.
Roundtable	A Roundtable is similar to advisory committees, but are typically broader in focus, looking at opportunities for collaboration across various sectors or groups
Partnership	A partnership may be a limited number of entities working together towards a shared objective(s) with join investment of resources.
Umbrella	An umbrella organization helps coordinate various groups with related goals.
Coalition	Often temporary, like-minded groups that build an alliance around a specific purpose.
ENGO	environmental non-government organization. May operate locally or internationally in environmental issues. As non-government entities, they can receive funds from private donors, corporations and other institutions. Unlike environmental movements, ENGOs have constitutions that state the rules of how power gets distributed among the membership. Not typically watershed-based but can be - in this case (and others).
Hybrid	A combination of any of the above attributes

A series of semi-structured interviews were conducted with key contacts for the selected case studies (Appendix D).A standard list of general questions was posed to each interviewee (Appendix D), along with ample opportunity to speak freely to offer their insights and salient points.

Table 3. Watershed Case Studies – Characteristics

Watershed/ Organization	Size	Drivers	Gov	NGO/ NFP	Other Notable Characteristics
Coquitlam River Watershed Roundtable British Columbia	261 km^2 (lower basin)	Historical resource & industry (gravel, logging, mining) Water quality, salmon population Rate of urban development		Yes	Est. 2011 (after 4-yr public consultation) Community driven
Cowichan Watershed Board Vancouver Island, BC	932 km^2	Water supply & quality Salmon population, flooding Deforestation, logging	Yes G2G		(CWB) jointly established in 2010 by Department of Fisheries and Oceans, Ministry of Environment, CVRD, and Cowichan Tribes, & support of the Living Rivers Trust Fund, and Catalyst Paper. Co-governance (G2G)
Okanagan Basin Water Board Okanagan Valley, BC	8,000 km^2 (200 km long)	Water scarcity, point source pollution, flooding, invasive species, climate change	Yes Mun ic		Legislation enables (Municipal) 3 regional, 12 municipal 6-7 First Nation reserves
Severn Sound Environmental Association Severn, ON	1,000 km^2	Water quality	Yes Mun ic		Legislation enables (Municipal) 6 main watersheds, including bays & inlets Small- to medium-sized urban centers 1/3 watershed is agricultural land use
Elizabeth River Project Virginia, US	647.5 km^2	Water pollution, industry, urbanization, climate change & sea rise, oyster population		Yes	*Uses collective impact, environmental equity. Citizen-driven.*
Long Tom Watershed Council Oregon, US	1,060 km^2 (92 km long)	Response to Oregon Plan for Salmon & Watersheds Water quality, drought and flooding, urbanization		Yes	State legislation enables creation, but community-led (33% of budget to community engagement). Considers social infrastructure. Agriculture & private forest land, reserves Urban & small towns, recreation on reservoir
Muskoka - Reference	5,100 km^2 (120 km long)	Flooding, shoreline development, water quality, climate change, invasive species		Yes	1 District 13/14 lower-tier municipalities

Each case study is presented under five categories of consideration:

1) Context
   - Watershed Profile (biophysical, land use, drivers)

- Larger Government Context (provincial/state)
- History of the Organization

2) Organizational Structure and Governance
   - Organization Description
   - Structure and Governance (boards, committees, etc.)
   - Planning, Programs and Partnerships

3) Social Infrastructure/Public Engagement
   - Trust and Cooperation
   - Social Infrastructure, Community Involvement and Leadership

4) Finances and Financing
   - Current Arrangements (sources, budget, etc.)
   - Challenges, Vulnerabilities and Future Financing

5) Adaptability of the Organization
   - Strengths and Limits
   - Future Challenges (climate change, shifting values, priorities, maturity)

Case study results present key learnings by considering strengths, weaknesses, similarities, differences, challenges and successes in community-led watershed management. A summary follows highlighting key elements from the case studies that enabled community-led collaboration. Finally, some potential opportunities for community-led IWM in Muskoka are presented for consideration.

Case Studies - British Columbia

Larger Government Context - Water Governance in BC

Canadian water management varies from province to province, often driven by ecological, economic and social circumstances (Bakker, 2006). In British Columbia, water management responsibilities are divided among all orders of government, including federal, provincial, regional, municipal, First Nations, and at times, crown corporations, NGOs and the private sector. Hunter et al. (2014), note legislation associated with water in at least seven federal and 12 provincial acts, as well as local government powers delegated by the province.

BC's primary law on water management is the Water Sustainability Act (gov.bc.ca, 2017). It opens a framework for plans and local governance; however, the province has put little to no funding here (Tull, 2022b). The Act followed the previous Water Protection Act, which required modernization to reflect changing water demands from increased growth in the BC population and economy (Melnychuck et al., 2017).

There is a trend toward the province sharing or devolving responsibilities to municipal and regional governments with a shift in emphasis on public participation and community-based approaches to planning and management (Nowlan & Bakker, 2007). However, in much of the province, unresolved treaties and debates on First Nations land and water rights challenge the legitimacy of BC water management decisions (Melnychuk et al., 2017).

The Declaration of the Rights of Indigenous People Act in BC (2019), establishes the UN declaration as a provincial framework. This has enabled Indigenous-led watershed plans and co-management arrangements. For example, the Nicola Nations have a Memorandum of Understanding with the province for a freshwater initiative to develop a Nicola watershed plan (a tributary of the Fraser). In 2010, the Cowichan Tribes and the Cowichan Valley Regional District (CVRD) entered into the first co-management agreement in the province for a Watershed Board. Recently, they signed an additional agreement for co-management and the creation of a water sustainability plan in the adjacent Koksilah watershed (CWB, 2021).

The application of different regulations in different areas continues to create a patchwork of water management through organizations with variability in mandates, structures, public participation and financing across the province (Nowlan & Orr, 2010). As a result, watershed or basin organizations range from voluntary to legally enabled and from citizen-based to top-down government-coordinated, as well as First Nation - government (G2G) - or a blend of approaches.

In 2021, due to both the pandemic and the effects of climate change felt in BC, several provincial funding opportunities were created. For example, as part of its $10 billion COVID-19 economic recovery plan, BC provided $27 million for watershed conservation and restoration projects in communities across the province, as part of both a jobs and economic stimulation package and to restore and prepare watershed communities (bcwatersheds.ca).

Coquitlam River Watershed Roundtable

Context

Watershed Profile – Coquitlam River

The Coquitlam River is a tributary of the Fraser River in British Columbia. The watershed is split into two sections, the upper (193 km^2) and lower (60 km^2) Coquitlam River watershed. Its source is Disappointment Lake, in the Coast Mountains near Indian Arm. From there, it flows south into Coquitlam Lake, a reservoir behind the Coquitlam Dam. The river continues past the dam, south to the lower mainland until it reaches the Fraser River between Coquitlam and Port Coquitlam (north-east portion of metro Vancouver) Figure 2

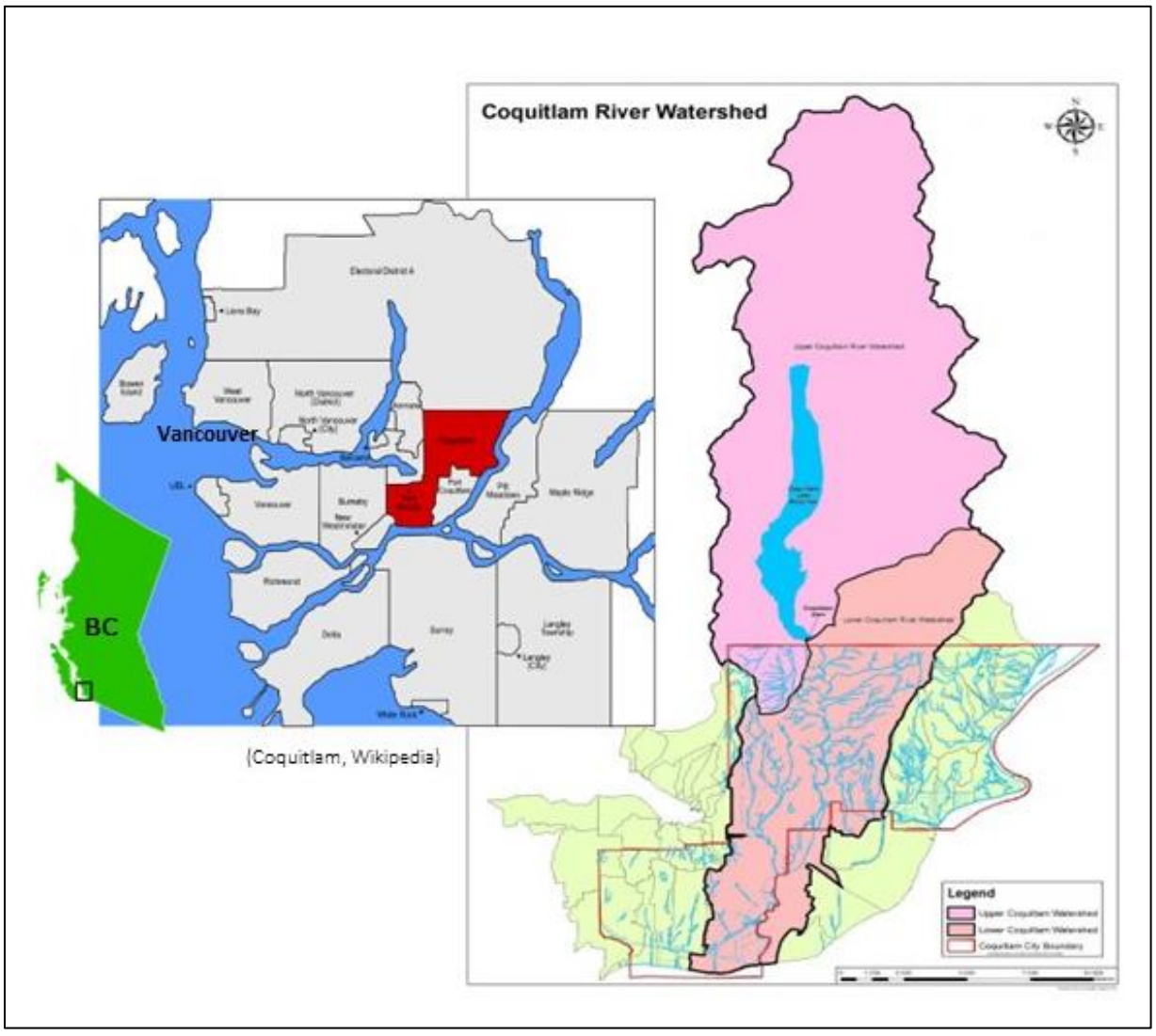

Figure 2. Coquitlam River Watershed, CRWR

Located on the coast, the area experiences an oceanic climate with mild temperatures and high precipitation; warm, dry summers; and cool, wet winters. The area is rich in land and water resources and cultural heritage features. Approximately 30 tributaries are located along the river with oxbow lakes, wetlands and side channels. The riparian vegetation includes evergreens such as, Coastal Western Hemlock, Western Red Cedar and deciduous black cottonwoods, providing excellent habitat to a diversity of species. The river and its tributaries are home to 24 different species of fish, five of which are salmon and a critical part of the ecosystem. The river's name comes from the Kwikwetlem First Nation whose ancestral lands and people date back 10,000 years. The word Kʷikʷəƛ̓əm translates to "red fish up the river." Salmon have always been integral to their survival and culture.

Human activity has significantly impacted the Coquitlam River for over a century. In 1904, the first dam was built to provide water supply. By 1914, dams were creating hydropower for growing communities on the mainland. The dams cut off spawning and rearing habitat for salmon in the upper part of the river, bringing the sockeye salmon populations to near extinction.

During the 1950s, industrial activity and urbanization altered the natural features of the watershed. Gravel extraction often removed gravel directly from the river, destroying pink and chum salmon spawning beds, until this practice was banned in 1965. Commercial logging affected forest cover habitat and caused riverbanks to become unstable during heavy precipitation events (coquitlamriverwatershed.ca/history). Both these resource industries continue to be important sectors in the economy with ongoing impacts to the river. Other key sectors include manufacturing, retail, airport and port services, professional services and tourism (coquitlam.ca).

Currently, one of the most important pressures in the lower watershed is urbanization. Mainly a suburban area, Coquitlam is the sixth-largest city in the province, with a population of 148,625 (Coquitlam River Watershed Roundtable, CRWR, 2022). Over 75% of lands in the lower watershed are fully developed. By 2040, population growth is expected to rise 73% to 224,000 in Coquitlam and 47.5% or 85,000 people in Port Coquitlam (CRWR 2018).

Both the climate, with high annual precipitation and its position on the mountain have created a long history of flooding in the area. A significant and increasing portion of the watershed drainage is carried in a storm sewer system (CRWR, 2022), with implications for adequate water levels for fish habitat and the potential for future flooding in urban areas.

History of The Coquitlam River Watershed Roundtable

For many years, the stewardship community, aggregate industry and governments were at an impasse over the state of health of the Coquitlam River for salmon, while still advancing urban development and resource and water extraction (coquitlamriverwatershed.ca). In 2007, Fisheries and Oceans Canada recognized that dialogue was needed to resolve ongoing conflicts among the many sectors and groups in the watershed. A small amount of funding was provided to the City of Coquitlam to organize a process that would bring stakeholders together. It was agreed that a community engagement process to develop a common vision for the watershed would enhance communications between diverse sectors (coquitlamriverwatershed.ca)

An advisory committee was formed and endorsed by the Cities of Coquitlam, Port Coquitlam, Aggregate Advisory Committee and Kwikwetlem First Nation. From 2007 to 2011, a multi-phased research project

took place that aimed to identify watershed interests and shared mission, determine current roles and responsibilities in the watershed and develop an accountability framework.

During the process, visions began being translated into the first steps to forming a Coquitlam River Watershed Strategy. These steps included four phases: (1) Background and Research; (2) Community Engagement and Visioning; (3) Governance Structure and Development; and (4) Implementation (participedia.net/case/4580). While there were numerous entities involved in the process, it was primarily the City of Coquitlam and the Kwikwetlem First Nation, who agreed to lead the planning phases of the watershed plan from Phase 1 in 2007 to Phase 4 in 2011.

A Project Team was formed to research and review the history of environmental activities that took place in the Coquitlam River Watershed. The members of the Project Team included the City of Coquitlam, Kwikwetlem First Nation, Watershed Watch, and Fisheries and Oceans Canada. After the team had concluded its research, a consultant (JR Environmental), was hired to compile findings in "The Story of the Coquitlam River Watershed Past, Present and Future." This document highlighted all essential information needed for planning, including a list of all stakeholders and applicable jurisdictions and roles in the watershed. Above all, this initial research phase set out recommendations for Phase II of the Coquitlam River Watershed Strategy, which outlined how public participation would take shape throughout the planning process (CRWR).

In Phase 2 and 3 of the Coquitlam River Watershed Strategy, public engagement sessions were held in order to ensure the wider community's values and perspectives were captured. CRW Strategy workshops varied from 45-65 individuals including representatives from local, regional, provincial, federal and First Nations governments, as well as individuals from conservation and recreation groups, local business and real estate development industry, and local residents.

Facilitated workshops offered spaces where a wide range of perspectives were shared and deliberated. Several participants gave presentations to provide background information, scientific data, and perspectives of the group or community that they represented. Above all, participation was sought to inform the design of the watershed plan, the structure of the permanent planning entity (i.e., the Roundtable), and for broader-scale visions and values to lead the process moving forward. Thus, in alignment with the Open Standards Framework, the participants were actively shaping the structural and procedural foundations of the Coquitlam River Watershed's future planning activities.

Specific workshop topics included, creative and collaborative planning processes; review of possible governance structures such as coalitions, roundtables, societies, councils, etc.; drafting mission statements and values; and examining the current problems, brainstorming solutions and considering practical limitations. Processes and documents helped to set the foundation for facilitating collaborative resolution to problems, informing and educating the public and supporting conservation through an integrated watershed management plan.

Some discussions were difficult and went on for years, but what all could finally agree on, was the desire for a healthy river for fish and people. At the same time, there needed to be recognition that the Coquitlam River is a 'working river.' The inclusion of First Nations at the table was essential (Birch 2022).

In 2012, the Roundtable received funding from the Real Estate Foundation of British Columbia, Metro Vancouver and the Bullitt Foundation, through the Watershed Watch Salmon Society, to begin its

watershed management planning process (CRWR, 2015). The CRWR used the funding to hire consultants with expertise in watershed planning and the Open Standards for the Practice of Conservation. As a result, the initial four partners established the Coquitlam River Watershed Roundtable (CRWR, 2015). Over the years, other partners have joined.

Organizational Structure and Governance – Coquitlam River

Organization Description

The CRWR deals with concerns in the lower watershed only. The Upper Coquitlam watershed is protected for drinking water under a 1,000-year lease to BC Hydro. The area has strict regulations and protections to keep it in the most pristine condition possible. However, water being held and controlled there, even though outside the watershed, still has an impact. Therefore, it is important that BC Hydro is at the table to discuss issues in the Lower watershed (Birch, 2022).

The CRWR coordinates and implements activities which promote the long-term sustainability of the Coquitlam River watershed. Types of activities undertaken include coordinating monitoring efforts; contributing to the preparation of a watershed plan; sponsoring education and community events; or working toward a consensus on issues that affect the watershed (CRWR, 2012). The Mission statement is "to preserve and enhance the health of the Coquitlam River Watershed through collaboration, education and advisory action (CRWR, 2022)."

The CRWR has no authority, and it does not advocate any particular position or align with interest groups. It acts as a consultative coordinator. Roundtable participants come from all sectors of interest in the watershed including governments, non-government organizations, the private sector and individuals. The Roundtable has an integral role in informing, educating and conducting outreach so that everyone concerned is at the table. Participation in the CRWR is voluntary and open to anyone with an interest in the Coquitlam River watershed and supports the CRWR's mission, values and guiding principles (CRWR 2016, Birch 2022). Of note, is the engagement and participation of the Kwikwetlem First Nation.

Coquitlam Structure and Governance

The Coquitlam River Watershed Roundtable is directed by Operational Guidelines and Core Committee Terms of Reference (CRWR, 2012, rev. 2021). The CRWR is assisted by a Core Committee comprised of sector representatives, including one or two designates as indicated:

- Municipal Government (City of Coquitlam, 2); (City of Port Coquitlam, 2)
- First Nations (Kwikwetlem, 2)
- Regional Government (Metro Vancouver, 1)
- Federal Government (Department of Fisheries and Oceans, 1)
- Provincial Government (BC Ministry of Energy, Mines and Natural Gas/Ministry of Environment/Ministry of Forests, Lands and Natural Resource Operations, 1)
- Utilities (BC Hydro, 1)
- Aggregate Industry (1)
- Real Estate Development (1)
- Outdoor Recreation (1)
- Stewardship (3)

- Education (1)
- Arts and Culture (1)

The Core Committee acts as the Roundtable's administrative body or executive (Figure 3Figure 3). Approximately five to six sub-committees are tasked with the operations of the Roundtable and discussing watershed issues. Eighteen members form the Core Committee, and as resources permit, one staff is hired as a Roundtable Coordinator. Currently, there is a part-time support/liaison staff as well. The Core Committee is accountable to the Roundtable, and any business that requires formal approval is brought to the entire Roundtable (CRWR 2016).

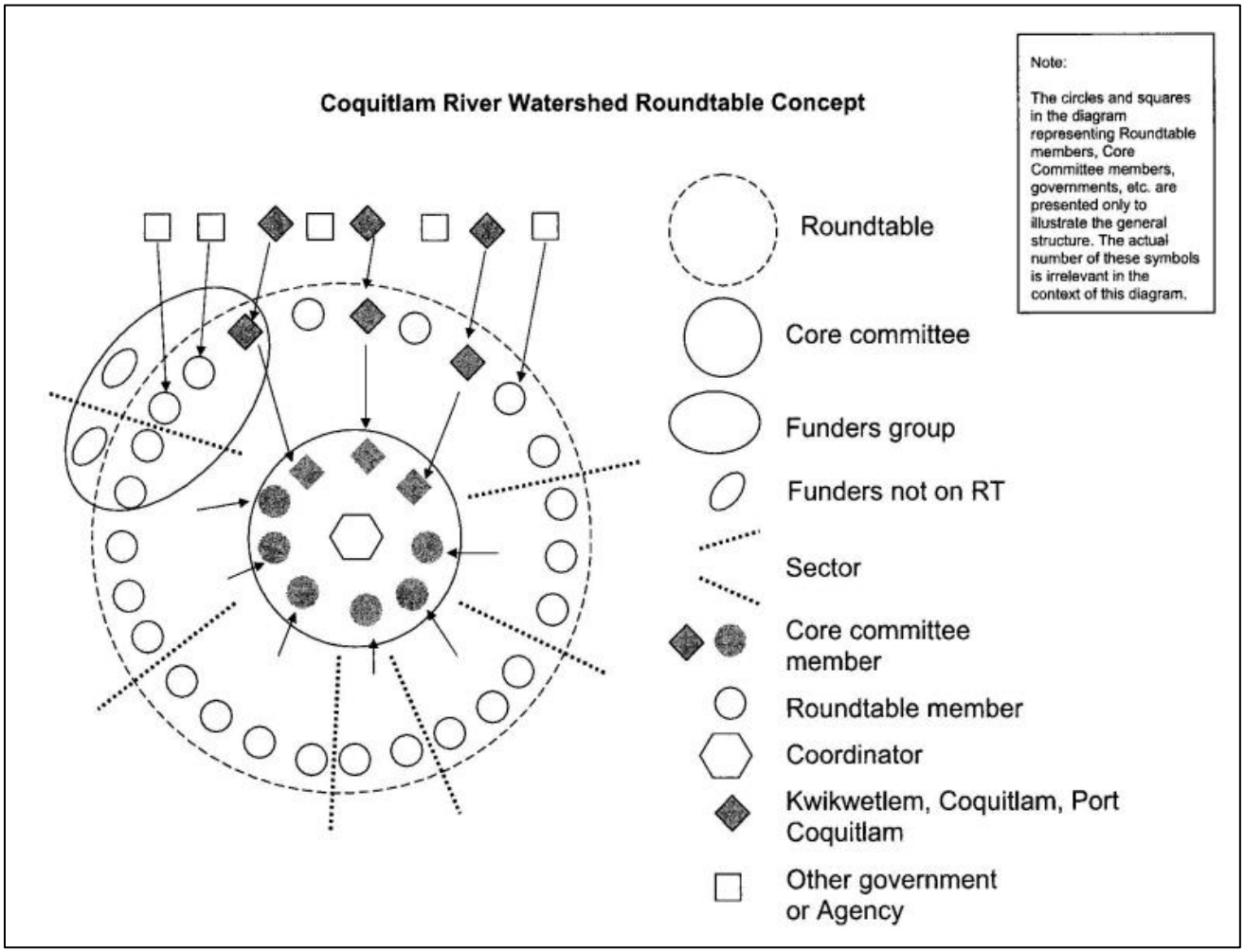

Figure 3. Coquitlam River Watershed Roundtable Structure, (Fraser Basin Council (FBC), 2016).

Individual sectors are responsible for selecting designates and alternates to represent their interests on the Core Committee. The entire group discusses issues and shares concerns from differing perspectives. All points made are documented, including First Nations views. Minutes of meetings are posted publicly, and copies are presented to the city as a matter of public record in the comments collected from the Roundtable. The provincial representative seat is currently empty, citing a lack of staff resources.

In November 2020, the Coquitlam River Watershed Society was incorporated under the BC Societies Act. As a society (non-profit), the Roundtable has additional opportunities to access external grants, other funding opportunities and benefits available to organizations with society status. Under this change, the multi-sector Roundtable Core Committee would serve as the administrative body to support the Coquitlam River Watershed Society, operating as the Coquitlam River Watershed Roundtable ("The Roundtable"). The members of the Core Committee were designated as the new society's Directors and would be guided by the Roundtable's Mission Statement, Common Vision, Values and Guiding Principles. Roundtable Terms of Reference and Society Bylaws were subsequently reviewed and updated in January 2021.

Planning, Programs and Partnerships

Between 2012 and 2015, over 60 partners in the municipal, provincial, regional, federal and First Nations governments, aggregate industry, arts and culture, education, outdoor recreation, real estate development sectors and stewardship groups worked together to create a watershed plan (CRWR 2015). Detailed action plans were drafted for three key watershed pressures: 1) Stormwater; 2) Invasive Species; and 3) Development, along with implementation support and resources. Funding was used to bring in experts from Simon Fraser University, the University of Victoria and the University of British Columbia.

Notably, in developing the plan, the Roundtable chose the concept referred to as the "Open Standards for the Practice of Conservation," which follows a five-step adaptive management cycle that seeks to integrate both ecological and human well-being concepts into the watershed planning process. The Open Standards were developed by the Conservation Measure Partnership (CMP) (a consortium of international conservation organizations with a mission to advance the practice of conservation by developing and testing tools to guide best practices in adaptive and results-based management). It has been widely adopted by resource management agencies and conservation groups.

Whenever the Roundtable feels it lacks adequate knowledge, outside experts are brought in (e.g., a lawyer to review low-impact development guidelines). The Roundtable commissioned a report by the University of Victoria's Environmental Law Centre on "Reducing Water Extraction and Increasing Environmental Flow in the Coquitlam River," to be reviewed by the Core Committee on how best to liaison and implement recommendations with governments.

From the outset, the Kwikwetlem First Nation has been a co-founder and active member of the CRWR. The Roundtable recognizes the long history of Indigenous peoples in the watershed. Over the years, the Kwikwetlem First Nation has partnered in joint initiatives with Fisheries and Oceans Canada (DFO), BC Hydro, Metro Vancouver, and the Cities of Coquitlam and Port Coquitlam in restoring sockeye salmon to the Coquitlam Reservoir. Their participation on the Roundtable is essential. One of the outstanding challenges is how to integrate traditional knowledge into watershed planning and management.

Social Infrastructure/Public Engagement

Trust and Cooperation

The Coquitlam River watershed is characterized by a variety of natural, rural-agricultural, urban and industrial landscapes as well as cultural, heritage, recreation and natural resource values such as the habitat and spawning of salmon (FBC, 2016). As a result, there is a complex plethora of interests, stakeholders and levels of government all active in the area. Competing mandates and interests led to a lack of communication and a feeling of mistrust. Establishment of the CRWR was a lengthy and sometimes contentious process. Perseverance and willingness of individuals to continue a dialogue and the openness of individuals to sit at the table and engage in difficult conversations was crucial to the founding of the Roundtable. Continually returning to areas of common ground or agreement was ultimately the path forward.

Over time, the CRWR has become a trusted organization. It is valued by the municipal government and other resource departments, as it acts as an intermediary step, rather than developers, aggregates, etc., lobbying directly to the mayor or provincial representative. The Roundtable is a respected voice in reviewing various plans such as climate action, planning committee reports and development proposals. As an external body with no regulatory power or advocacy role, they remain an open, consultative forum.

Social Infrastructure, Community Involvement and Leadership

As a facilitator of open consultation, the CRWR does not carry out any direct programming. However, they partner with various organizations for education, outreach and community events. The CRWR hosted meetings and webinars during the year on topics such as stormwater management and conducting outreach to individual homeowners. The installation of rain gardens engaged volunteers from geographical communities and interest groups. River and riparian area clean-ups were held in coordination with various community groups and local businesses. A partnership with post-secondary institutions is producing a report to identify low-impact development strategies, including relevant provincial building codes, local policies and bylaws. Yet, opportunities for direct public involvement are limited.

The CRWR communicates to the public through a regular quarterly “Backgrounder” (although the content is limited, primarily reiterating the Mission and Guiding Principles). There are a few hundred E-news subscribers. Annual reports offer a year of review and consideration of financials. Conservation and strategic plans and action plans can be found on the website. Occasional learning opportunities and public meetings are held throughout the year. CRWR has an active social media presence on various platforms, as well as you tube links to short information and demonstration topics. A Community Television/Community Content channel features a series on “Hidden Gems in the Coquitlam River Watershed,” depicting lesser-known areas and encouraging visitation and stewardship.

It is imperative that the Roundtable has a champion (or champions), who live, work or have some influence in the watershed, to keep the process moving and relevant. Appointments are typically for three years, so there is a turnover of Roundtable Members of the Core Committee.

Finances and Financing

Current Arrangements

From the outset, funding the CRWR was a challenge. Participants were reluctant to offer substantive financial support. However, the local governments donated in-kind support through a staff member, office space, photocopying etc. It soon became apparent that the people receiving the most benefit were not contributing. Yet, municipal meetings were running smoother, BC Hydro was providing 50% of the drinking water, tying them to regional concerns, and water drawdowns were impacting the flow levels, temperature and water quality for fish (Birch, 2022). Eventually, funding was sourced from regional and local governments, First Nations, and various donations.

The CRWR currently operates on one of the smallest budgets of any roundtable organization in British Columbia (CRWR, 2021) (Figure 4). In 2021, the Roundtable received $128,000 and carried over $35,434 from 2020 for a total of $164,215. Port Coquitlam provided $15,000, Coquitlam $35,000, Metro Vancouver $34,000 and Kwikwetlam First Nations $7,000 (CRWR, 2021).

The Roundtable's success relies heavily on the in-kind contributions of time, staff resources, venue and office supplies, totalling approximately $19,566 in off-setting operating expenditures. The primary expense of the Roundtable is the salary of a Roundtable Coordinator ($62,387), as well as Core Committee meetings, outreach event supplies, advertising and event insurance totalling cash expenditure of $99,422 with an overall total of $188,988 combined to account for in-kind contributions (CRWR, 2021).

Challenges, Vulnerabilities and Future Financing

Funding for the CRWR is an ongoing challenge. The year 2022, marks the 10th year anniversary of the Roundtable, and what the organization has been able to accomplish with such a small budget has been remarkable. In the coming year, funding agreements with the cities of Port Coquitlam and Metro Vancouver are due for renewal. Typically, funding agreements have a term of three years. While it is highly anticipated that funding partners will continue, it remains a source of vulnerability and fluctuation (e.g., funding in 2015-2016 dropped by approximately $60,000) (CRWR 2018).

In 2018, a report was completed investigating "Sustainable Funding Options for the CRWR." It clearly stated that,

> "Without a new finance model, the operations, credibility, and effectiveness of the CRWR are at risk. In the absence of a sustainable source of core funding, there is no financial security to maintain a Coordinator, which in turn jeopardizes the group's ability to apply for, receive, and leverage additional funds. If the CRWR continues to operate on a patchwork of short-term funding arrangements, it will lose any opportunity to lead long-range projects in the watershed, which would undermine the effectiveness of the group's work and its ability to provide key watershed services to its stakeholders (CRWR 2018)."

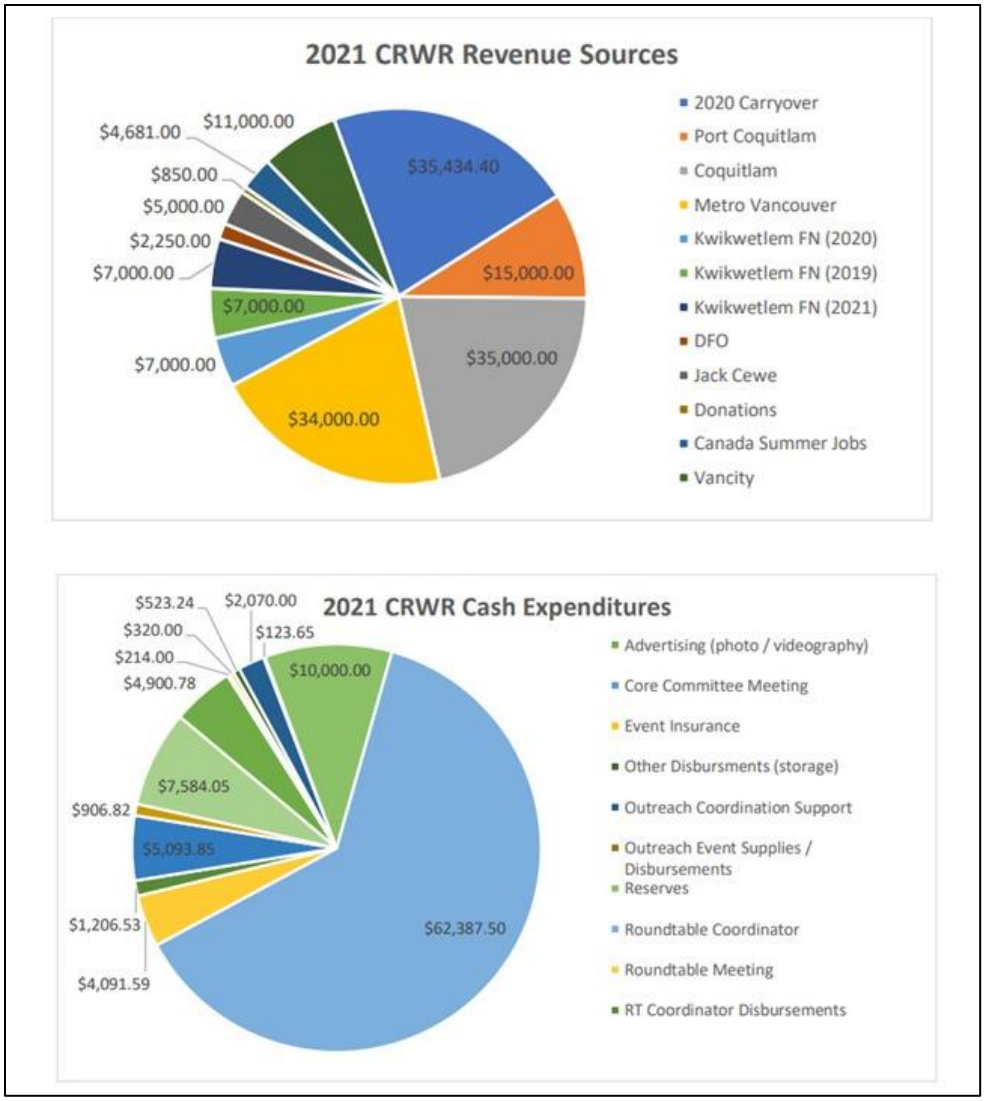

Figure 4. Coquitlam River Financials for 2021, CRWR.

From 2007 to 2017, grants and foundations were the primary funding sources. Since then, a larger share by local and regional governments has occurred. Securing sustainable long-term funding is key to enabling collaborative watershed governance initiatives. The report identified 13 funding mechanisms as having the potential to generate funds for a watershed group, including parcel tax (landowners), utility tax (utility corporations), royalty charges on pits and quarries, water extraction levy (regional government), endowment fund, grants, recreation fees and registering as a charity, etc., all with enabling legislation already in place. Suggested process steps are outlined, and consideration of a feasibility study may be warranted.

The CRWR will continue to seek a diversity of funding sources. Important discussions about cost allocation, financial structure, and delivery method of the new funding model will need to be developed (CRWR 2022).

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

The Coquitlam River Watershed Council now has a decade of experience behind them. In the view of one of the founders, key factors to their success are having champions to lead, agreeing to a common vision and maintaining ongoing dialogue and collaboration (Birch, 2022). One of the strengths of the CRWR is the inclusive representation which is open to all. Over time, mutual trust has evolved, which leads to open communication. The support and leadership of the City of Coquitlam contribute to legitimacy and ensure outcomes and actions are achievable within the planning process (Fielding, 2016).

A significant limitation of the organization is the lack of legislative authority. Other limitations include inconsistent participation by various government agencies (particularly at the provincial level), and a lack of a formal communications strategy. While the Conservation Standards model was comprehensive in developing the watershed plan, some thought the process was too complex and that there was an overall lack of capacity to deliver on some action items (Fielding, 2016). Yet the presence of a Conservation Strategy and implementation plan provides goals and a means to measure success.

The CRWR is tracking social media followers, e-news readers and participants at webinars and in-person events. Overall, there is a small, increasing trend, particularly in website users (approx. 1000). However, with a combined population of 156,000 in Coquitlam and Port Coquitlam, numbers for other social media platforms are negligible, ranging from 20 – 300 people, with one notable exception (5,000) for the Upper Coquitlam River Park video (CRWR 2021). Community Roundtable meetings/webinars tend to be fairly well-attended, with 117 in total. It brings to question the desire for and/or role of greater public visibility and engagement in supporting the Roundtable's work.

Future Challenges

In the last few years, British Columbia has experienced increasingly severe consequences of climate change through flooding, drought and wildfires, which have taken a severe toll on several communities, including the lower mainland. Trends in urban growth, resource extraction and drinking water needs will continue to affect the Lower Coquitlam River. As water levels drop, the effects on spawning grounds and water temperatures will continue to impact salmon populations.

As a non-regulatory agency, the CRWR relies on the voluntary participation of stakeholders and actions. Perhaps climate change will necessitate continued collaboration through the Roundtable. However, at the federal and provincial levels, governments are increasingly reluctant to deliver local services, sometimes pointing to limited funding, staff time and resources. Like other community-led initiatives, the question of how to finance watershed organizations is paramount.

The CRWR needs a sustainable funding model to ensure its longevity. While still vulnerable to changes in government, staff and priorities, a formalized structure and long-term agreement would assist in creating some stability for the organization. Further, greater potential exists for the Roundtable if there is a more robust budget in place.

Coquitlam References:

Birch, M. (2022). Semi-structured Interview & Conversation with Margaret Birch, Co-founder of CRWR, Support & Liaison – CRWR, and former Coquitlam employee, with S. Cooke and V. Hammond, report authors.

Coquitlam River Watershed Roundtable. (2022a). Addressing Climate Change Through Engagement: 2021 Annual Report.

Coquitlam River Watershed Roundtable. (2022b). Backgrounder: Summer 2022. (Newsletter)

Coquitlam River Watershed Roundtable. (2018). Sustainable Funding Options: Recommendations for the Coquitlam River Watershed Roundtable.

Coquitlam River Watershed Roundtable. (2016). Coquitlam River Watershed Roundtable Operational Guidelines and Core Committee Terms of Reference.

Coquitlam River Watershed Roundtable. (2015). Lower Coquitlam Watershed Plan. Final Draft Version: 1.0.

Coquitlam River Watershed Roundtable. (2012). Backgrounder: Summer 2012. (Newsletter)

Fielding, G. (2016). Evaluating the Coquitlam River Watershed Roundtable Planning Process and the Open Standards for the Practice of Conservation Framework. MA Thesis, School of Environmental Management, Simon Fraser University.

Fraser Basin Council (FBC) (2016). Guidance for Collaborative Watershed Governance in BC: Discussion Paper.

Online:

www.coquitlamriver.ca
www.coquitlam.ca
www.participedia.net/case/4580

Cowichan Watershed Board

Context

Watershed Profile – Cowichan Valley

The Cowichan watershed is in the eastern slopes of southern Vancouver Island, between Victoria and Nanaimo (Figure 5). It spans over 1,000 km^2 and is surrounded on three sides by mountainous areas. At the west end, headwaters drain to form Cowichan Lake stretching 32 km in length. The lake feeds the Cowichan River, which flows east approximately 50 km before emptying into the Strait of Georgia, separating Vancouver Island from the mainland (Hunter et al., 2014). The Cowichan River has both provincial and federal designations as a Heritage River for its natural and cultural significance.

The watershed is an area of contrast with mountainous areas receiving over 4,500 mm of annual precipitation and Lake Cowichan 2,000 mm, while the warm and dry lowlands receive less than 1,000 mm (vancouverisland.com/regions-and-towns; Hunter et al., 2014). Coastal rainforest and old-growth Douglas Fir and Western Cedar give way to a dry, Mediterranean climate from west to east (Pike et al., 2017). The area is known for its beauty, salmon runs and cultural significance (Hunter et al., 2014). From time immemorial, the Cowichan Tribes have called the basin their home, with communities and winter villages on the Cowichan River, Koksilah River and Cowichan Bay (Hunter et al., 2014). The Cowichan Tribes are BC's largest First Nations band and continue to live in the Cowichan area both on and off reserves.

On the Coast, Duncan is the largest center in the watershed, with approximately 5,000 people and acts as a service center for the entire Coquitlam Valley Regional District of 50,000 (duncan.ca). Between the mountains, some of the best agricultural lands on the coast support hobby farms, organic growers and wineries. Tourism is an important sector with visitors seeking culinary, cultural and scenic experiences and all types of outdoor recreation such as hiking, kayaking, sport fishing, etc.

Since colonialism, the Cowichan Basin has experienced a history of fishing, logging, mining and farming. Early land surveys revealed substantial mineral wealth and lucrative forestry potential. By 1912, the railway arrived, which opened the area. Thus, various lumber companies sprang up over the decades, purchasing large swaths of land for harvest. Many of the neighbouring communities started as camps or industry towns (kaatzastationmuseum.ca/history). Up until the mid-60s, dredging was performed as a flood control measure in the lower river floodplain near Duncan. The most significant alteration of the river was the installation of a weir at the outlet of Cowichan Lake. It allowed for the ability to hold water to augment summer flows (Pike et al., 2017).

As population and development increase, so does the rate of change in the watershed. Fisheries, forestry, agriculture, recreation and tourism, industry and cultural uses all compete for water in the basin. As of 2015, more than 530 licences had been issued to divert water from streams and lakes and more than 1,300 wells have been drilled to pump water from the aquifers (FBC, 2016). Pulp and paper mills are the largest water users.

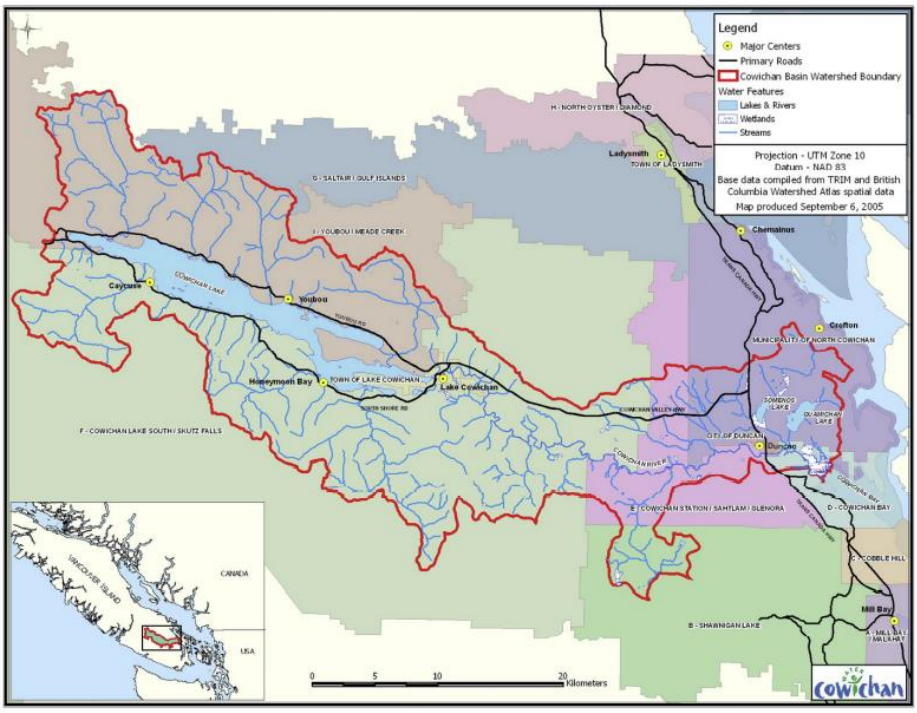

Figure 5. Cowichan River basin (Westland Resource Group Inc., 2007)

The depletion of old-growth and mature forests places increased pressure on water resources, riparian habitat and the natural hydrology of the region. Climate change is exacerbating both the high spring runoffs and severe drought conditions. In 2019, for the first time ever, Cowichan Lake water storage was completely depleted by August, requiring electric pumps to maintain minimal water river flows for fish. Farmers have been restricted from irrigating crops for the past two years, including a legal Fish Protection Order from the province (CWB, 2021).

History of The Cowichan Watershed Board

During the 1990s, concerns about declining water flow in the Cowichan River during summer and fall were growing. In 2003, a significant drought placed severe ecological and economic pressures on the region as spawning Chinook Salmon had to be trucked upstream. That year, the Cowichan Stewardship Roundtable was formed, recognizing that Cowichan Valley residents must share information and work together to address watershed concerns. See Figure 6, which illustrates the evolution of the Cowichan Watershed Board over time.

Shortly thereafter, the development of a Cowichan Water Management Plan was commissioned by Cowichan Valley Regional District (CVRD), Cowichan Tribes, provincial resource ministries, Fisheries and Oceans Canada and the local pulp and paper mill. A public planning process was carried out for the next few years, and by 2007, the plan was complete. Eighty-nine objectives were identified, and leadership for each was assigned. However, no funding was available, and no governing body had the mandate to coordinate between the various organizations with overlapping jurisdictions. Further, Indigenous leadership and participation were lacking (cowichanwatershedboard.ca).

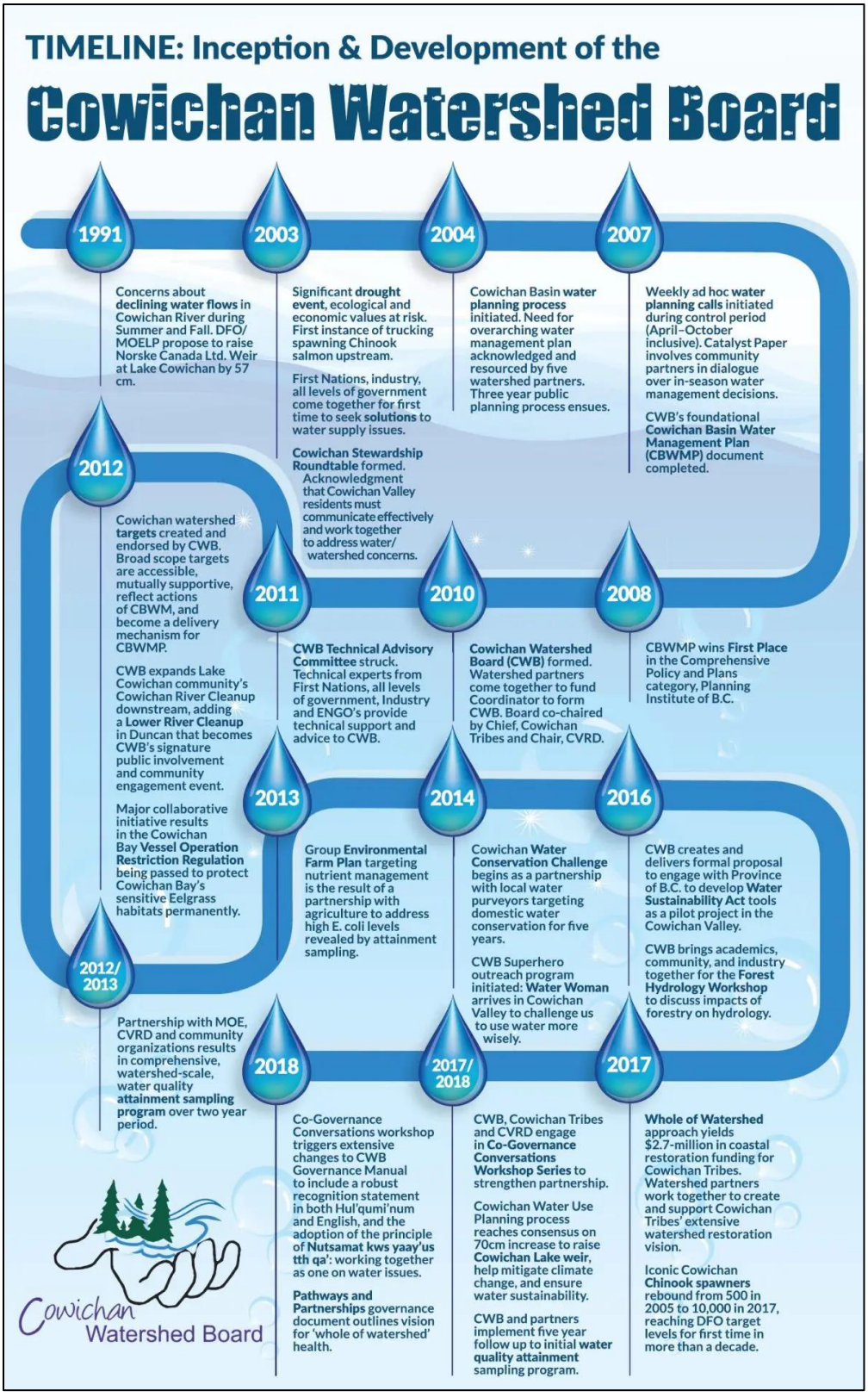

Figure 6. Evolution of the Cowichan Water Board from 1991 to 2018 (cowichanwatershedboard.ca).

In 2010, the sitting Cowichan Tribes Chief and the CVRD Chair came together and with the support of various partners, created the Cowichan Water Board (CWB). The governance structure was anchored by an equal partnership of the two governments and co-chaired by the leaders of each (CWB, 2020). The Living Water Trust Fund and other partners funded a co-ordinator.

A Technical Advisory Committee was formed in 2011 with various experts, First Nations, all levels of government, industry, academics and ENGOs to provide technical support and advice to the Board. Further, the Cowichan Watershed Society was established in 2014, as a non-profit society to provide financial and administrative support for the work of the Cowichan Watershed Board.

Work continued with the CWB through many coordinated plans and projects with various partners. By 2017, the spawning Cowichan Chinook rebounded from 500 – 10,000, reaching DFO targets for the first time in more than a decade (cowichanwatershedboard.ca). From 2017-2018, co-governance workshops were held and extensive changes were made to the CWB governance manual, along with a revised vision for the whole of the watershed health. Recognition statements were formed in both Hul-qumi'num and English, including the adoption of the principle – Nutsamat kws yaay'us - working together as one on water issues.

Organizational Structure and Governance – Cowichan Watershed Board

Organization Description

The CWB is a local governance entity created to improve collaborative management and decision making to protect and enhance the health of the watershed. Key to the CWB's mandate is providing leadership for water management guided by the Cowichan Teaching: Muks 'uw'slhilhukw'tul – which roughly translates to "We are all inter-connected (CWB, 2018)."

Members of the Board include representatives from Cowichan Tribes, Cowichan Valley Regional District, local municipalities, and federal and provincial governments.

Some of the roles played by the CWB are:

- Guiding and coordinating the implementation of the Cowichan Basin Water Management Plan
- Engaging local stakeholders in water management decisions
- Advising senior and local governments, including First Nations
- Gathering information and monitoring the health of the watershed, and
- Developing public outreach and extension tools to enhance watershed thinking and to increase understanding of science, stewardship and management activities

The CWB has no legislative or regulatory authority, instead, it supports wise water management practices in an advisory capacity. Federal and provincial partnership grants support projects related to priorities and targets in the watershed, led by CWB, CVRD and many smaller organizations (CWB, 2020). Since its inception, the CWB has played a critical and collaborative leadership role in watershed sustainability in the region. The Board has a strong record of planning and implementing technical work, creating a culture of water conservation, promoting science-based learning and implementing respectful, community-based solutions.

Cowichan Structure and Governance

The Cowichan Watershed Board is recognized as a unique and successful model between a First Nation and Regional Government, one of the first in the province of BC. A shared interest in working together to restore watershed health in the face of an ecological and cultural crisis provided the catalyst (CWB, 2021). Further, it demonstrated a commitment to moving toward reconciliation through recognition of territory, the inclusion of traditional knowledge and culture and an Indigenous voice in decision making (cowichanwatershedboard.ca).

The CWB consists of up to 14 members appointed as follows:

- Three members from the CVRD, including one member who will serve as Co-Chair of the Board;
- Three members from the chief and councillors of Cowichan Tribes, including one member who will serve as Co-Chair;
- One or two members recommended by the federal government;
- One or two members recommended by the provincial government; and
- Up to six members-at-large jointly appointed by CRVD and Cowichan Tribes to provide specific local knowledge. At least half of the at-large appointments are required to be publicly elected representatives of CVRD, Cowichan Tribes or local municipalities (CWB, 2018).

The Technical Advisory Committee assists the work of the CWB, made up of four working groups:

- Fish and flows sustainability;
- Communications, Conservation/Watershed IQ;
- Estuarine health and water quality; and
- Riparian (FBC, 2016).

These working groups are aligned with the targets of the Cowichan Basin Water Management Plan. Figure 7 provides an illustration of the organizational structure of the CWB.

The Cowichan Watershed Society is governed by a Board of Directors, a sub-set of the current Cowichan Watershed Board membership. All CWB members are invited to the Society Board but not all accept the additional responsibility; approximately half of the CWB members currently serve on the Society Board (cowichanwatershedboard.ca). Society Directors include both elected representatives from Cowichan Tribes and local governments, as well as appointees with watershed expertise.

A part-time Coordinator is employed by the Cowichan Watershed Society and is responsible for convening and communicating with stakeholders and acting as an essential liaison between the Cowichan Watershed Board and the Technical Advisory Committee. In addition, the Society provides additional contract staff as needed. In the 2021 Business Plan, four positions are noted: Executive Director & Lead for Salmon, Science and Partnerships; Project Coordinator & Lead Communications and Engagement; Forest Ecologist & Lead for Targets Review; and Bookkeeper & Financial Systems Support. Currently, positions are filled by near, semi- or retired individuals with a wealth of experience and backgrounds (CWB, 2021). A schematic of the Organizational Structure for the Cowichan Watershed Board follows.

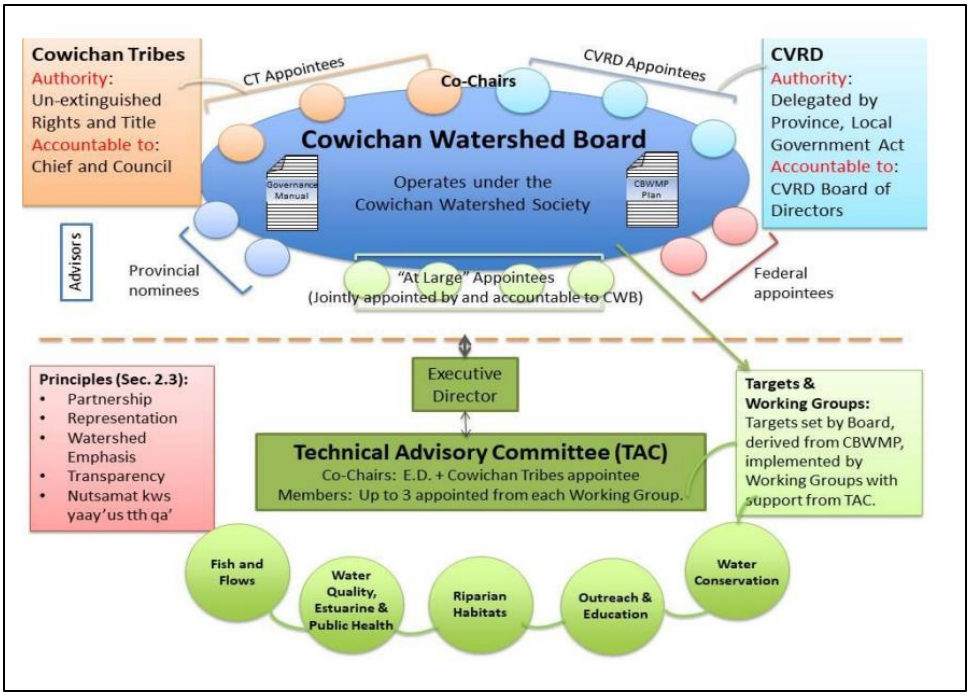

Figure 7. Organizational Structure of the Cowichan Watershed Board (Cowichan Water Board Governance Manual, Version 3, 2018)

Planning, Programs and Partnerships

Following the 2003 drought and leading up to the formal establishment of the CWB, water management in the Cowichan Valley has been guided by a Watershed Management Plan, including implementation strategies and areas of responsibility. Further, the CWB provides an Annual Business Plan which identifies key areas of focus for the upcoming year, broader goals and milestones for the next five years and the financial plan to achieve improvements (CWB, 2021). Throughout the year, working groups review progress on targets and update anticipated targets for the following year.

Several further governance documents have been developed by the CWB, through public consultation, subcommittees and partnerships. In particular, "Pathways and Partners" provides a framework for collaborative water management and reconciliation in the watershed as co-governance by CRVD and Cowichan Tribes continues to move forward (CWB, 2018).

Following the announcement in February 2020, of a government-to-government agreement (G2G), between the Cowichan Nation and the Province of BC for further co-governance, the Cowichan Nation conducted a 16-month scoping process with the province to examine decision making and the long-term agreement for the collaborative management and governance of the Koksilah watershed (adjacent to and empties with the Cowichan River into Cowichan Bay) (CWB, 2021). A report was produced in 2021.

In any given year, the CWB is engaged in numerous projects with various partners and funding arrangements. With different natural resources present and the location along the coastline, numerous jurisdictional agencies are involved and provide funding through grant programs. For example, the aging weir no longer has the capability or reliability to support various water uses. Through a grant from Canada and BC under the Clean Water and Wastewater Program, as well as Catalyst Paper (main

employer and water user in the area), funding was provided to develop a water use and sustainability plan for the future. Examining future needs, supply and storage options is essential for the region (cowichanlakeweir.ca).

Other partnerships and funding grants center on water quality, conservation and climate change, fish flows, monitoring of salmon and steelhead populations, etc. Often, various ministries or federal department provide expertise. In addition, partnerships with the University of Victoria (UVIC), provide research and fieldwork support.

Social Infrastructure/Public Engagement

Trust and Cooperation

People in the Cowichan basin have been modelling collaborative approaches to stewardship since the 70s, when local citizens came together to protect the Cowichan estuary. High levels of engagement have continued to present day, as evidenced by the role of First Nations and the presence of many progressive stewardship and conservation groups.

In addition, the designation of the Cowichan River as a Heritage River in the mid 90s, helped set the tone for "a model of watershed cooperation among a wide variety of stakeholders to meet multiple resource use objectives (cowichanstewardship.com)." So, while the crisis of the 2003 drought may have created a window of opportunity for the creation of the Watershed Board, many networks of local groups and partners and a prevailing philosophy of stewardship was already in existence. Through the reliance on science and traditional knowledge, the CWB has built legitimacy in their work and reputation. They are a trusted entity in the watershed that fills in leadership gaps and governance vacuums while focussing on local issues and solutions where the greatest impact is realized.

Social Infrastructure, Community Involvement and Leadership

The building and nurturing of respectful relationships with the community of partners and stakeholders in the Cowichan is a priority of the CWB. As Cowichan Elders have often said, "We all live here together, we have to work together for the watershed (Hunter et. al., 2014).

The CWB's approach to community engagement is threefold:

Enabling Others. The Board does not view itself as the doer, rather it offers a way to facilitate local groups taking action, such as letters of support or small amounts of funding, if possible

Encouraging Learning and Participation. Working with partners presents opportunities for the community to learn about the watershed. Annual river clean-ups, watershed tours, a monthly speaking series and in collaboration with the Cowichan Land Trust, watershed learning experiences for elementary students are all regular community activities

Respect and Dialogue. Rather than marginalizing groups or seeking regulatory action, the first response by the CWB is to assemble facts and engage in dialogue. Often, situations that could have resulted in conflict are transformed in cooperative problem-solving (Hunter et. al., 2014).

The CWB is transparent in its actions with latest news postings, Board minutes, reports and governance documents readily available on their website. They host a Roving River Reporter Outreach program where information, interviews and presentations are posted for viewing. The CWB introduced a Coast-Salish designed chinook mascot as a tool to express and embody hope for the watershed. The “Big Dancing Fish” helps to animate watershed friends and audiences, and shares some of their stories on social media, including Facebook, You Tube and Instagram.

Finances and Financing

Current Arrangements

When the CWB was established, it took over a year and a half to access project funding. In hindsight, the lack of funding resulted in some benefits, as it allowed the technical committee time to develop a detailed understanding of the issues affecting the watershed, build relationships and establish priorities (Hunter et. al., 2014). The presence of a common understanding and a solid organizational foundation better positioned them to set clear, attainable targets and seek financial support for project implementation. At the time, the Cowichan Watershed Society was established to streamline financial management, expand fund-raising opportunities and seek charitable status.

Today, the CWB continues to operate on a very modest budget of approximately $203,000. Since 2014, the operating budget has remained at approximately $70,000: Fifty-thousand dollars coming from the CVRD and $20,000 from the Cowichan Tribes. This provides just enough support for a part-time coordinator, administrative support and communications. It seems current funding is barely adequate to maintain the work of the Board.

In 2020, approximately $130,000 was received in grants with BC Water Funders and Eco Action each contributing $30,000 - $32,000, followed BC freshwater legacy and BC government at around $20,000 each. These monies were directed at fish and flow programs, water conservation and climate change projects, water quality testing and engagement and outreach tools (CWB, 2020).

At the same time, over $30 million dollars in federal and provincial partnership grants are currently supporting projects directly related to priorities and targets in the Cowichan watershed. Further funding of $24 million dollars towards the replacement of the weir, restoration of riparian function and flood mitigation work in the estuary, was awarded to the Cowichan Tribes by the Government of Canada for projects developed in partnership with the CVRD (CWB, 2020). A one-million-dollar grant from BC Salmon Restoration and Innovation Fund will be administered over a three-year period by the Cowichan Tribes to study the population abundance rates for salmon in areas of the river and tributaries where no data currently exists. In 2020, the Cowichan Watershed Society received $500,000 from the covid-recovery initiative for habitat mapping and environmental and Indigenous flow studies.

Challenges, Vulnerabilities and Future Finance

Through partnerships and co-governance with First Nations, the CWB can access both large and small provincial and federal funding grants toward watershed projects and targets. Further, as a Heritage River, small funds and protections are in place. With the number of different water users, natural resources, multi-jurisdictional agencies, conservation organizations and First Nations in the watershed, a varied pool of funding resources is available. At the same time, access to federal and provincial funds is often contingent on political and economic priorities. The reliance on these sources alone can become

"opportunistic" funding that in the absence of clear planning, implementation and business plans, can begin to steer projects and priorities within a watershed. As an example, in the 2021 Business Plan, projects aimed at climate action and awareness were deferred, pending funding sources.

In terms of operating funds for the CWB, there appears to be no increase in monies received from the CVRD or Cowichan Tribes in the last eight years and no expected increase forecast until 2024, with $10,000 more from CVRD and $5,000 more from the Cowichan Tribes (CWB, 2021). In part, the rural and small community make-up of the watershed limits the population and community capacity for funding from both the CRVD or Cowichan Tribes. However, it is not clear if the present funding will be adequate to support operations of the CWB moving into the future. Most notably, it impacts the ability to source and keep experienced staff for extended periods and maintains a heavy reliance on government funding grants. It is beyond the scope of this project, but further investigation into the Cowichan Watershed Society may reveal some alternative, charitable funding sources or potential.

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

Over the years, the building and maintaining of relationships and partners, in particular, the full co-governance partnership with Cowichan Tribes, has been core to the CWB. Providing leadership at the local level where decisions have the greatest impact has been one of the keys to their success. The year 2020, marked the tenth anniversary of the CWB. Initiatives worked on for more than a decade to secure a healthier watershed are finally coming together and having an impact (CWB, 2021).

As the first co-governance arrangement with a First Nation, the CWB and the Cowichan Tribes have dedicated much time and effort into public consultation and discussions on collaboration, governance and decision making, as reflected in the documents produced. In addition, the continual monitoring and updating of watershed and strategic plan goals and targets are integrated into an Annual Business Plan such that progress and readjusting goals is ongoing.

The presence of multiple agencies and mandates can cause interjurisdictional conflicts and overlap. The CWB has no regulatory authority, rather it relies on the willingness of community, business and industry partners to collaborate and act. As pressures continue to increase on the water resource, and greater impacts from climate change are experienced, difficult decisions and trade-offs will be required. The role of the CWB in collaborative leadership may be more important than ever.

Future Challenges – Cowichan

Most of the watershed is privately managed forest lands, governed by the Private Managed Forest Land Act. As a result, primary resource management responsibilities are in the hands forest companies. Local and Indigenous governments have limited opportunity to participate in or influence decision making for these lands (CWB, 2018). The CWB has provided a submission to the Private Managed Forests Lands Review Program, province of BC. Concerns remain about the impact of forest operations along the river and throughout the watershed.

It is unclear how funding from the CVRD and Cowichan Tribes has been established or calculated and whether or not this funding is secure from year-to-year. Hence, the long-term sustainability in funding to support the CWB may be tenuous.

Cowichan References:

Cowichan Tribes & Province BC. (2021). Water Sustainability Plan: Scoping Project. https://www.koksilahwater.ca/_files/ugd/deeaf5_5b4e7b696483444bb6d1b954d388667a.pdf

Cowichan Watershed Board. (2021). Business Plan Update.

Cowichan Watershed Board (2020). Annual Report – 2020. https://cowichanwatershedboard.ca/wp-content/uploads/2021/03/CWB_2020_AnnualReport_FINAL-DRAFT.pdf

Cowichan Watershed Board (2018a). Pathways and Partnerships: A Framework for Collaboration and Reconciliation in the Cowichan Watershed. https://cowichanwatershedboard.ca/wp-content/uploads/2019/08/CWB_PathwaysAndPartnerships_Final_web.pdf

Cowichan Watershed Board (2018b). Governance Manual, version 3, September 24, 2018. https://cowichanwatershedboard.ca/wp-content/uploads/2019/08/CWB-Gov-Manual-Version3-Sept-24-2018.pdf

Hunter, R., Brandes, O.M., Moore, M-L, & Brandes, L. (2014) The Cowichan Watershed Board: An Evolution of Collaborative Watershed Governance. Polis Project on Ecological Governance: watersustainabilityproject.

Melnychuk, N. and de Loe, R. (2020). Legitimacy assessment throughout the life of collaborative water governance. *Environmental Policy and Governance, 30: 14-28.*

Pike, R., Young, E., Goetz, J., Spittlehouse, D. (2017). Cowichan River: A Summary of Historical Disturbances, Water Use Pressures and Streamflow Trends. *Water Science Series, 2017 (05). Province of British Columbia.*

Westland Resource Group (2007) Cowichan Basin Water Management Plan https://www.cvrd.ca/DocumentCenter/View/105373/Cowichan-Basin-Water-Management-Plan-2007

Online:

www.bcwatersheds.ca
www.cowichanwatershedboard.ca
www.cowichanstewardship.ca
www.cowichanlakeweir.ca
www.kaatzastationsmuseum.ca/history
www.vancouverisland.com/regions-and-towns

Okanagan Basin Water Board

Context

Watershed Profile – Okanagan Basin

The Okanagan Basin is a narrow valley, approximately 200 km long (covering 8,000 km^2), in south-central British Columbia. It is a semi-arid area located in the interior plateau of the province between the Coast and Southern Rocky Mountain ranges. The Okanagan River flows from the northern reaches southward, draining six main lakes and crossing the international boundary into the US, as a tributary to the Columbia River (Melnychuk et al., 2017) (Figure 8).

The hydrology of the basin is influenced by snowpack and subsequent spring run-off from the high areas, while the Coastal Mountains provide a rain-shadow enhancing the semi-arid characteristics of the valley (Jatel, 2013). The Okanagan area typically receives less than 30 mm of rain annually in a precipitation gradient decreasing from north to south (Melnychuk et al., 2017). The valley floors support sparse grassland and shrub vegetation while the highlands receive enough rainfall to support forest and subalpine vegetation. The main features of the basin are Okanagan Lake and five smaller lakes which are heavily regulated with dams at each outlet.

The basin has been home to the Okanagan (Syilx) First Nations people since time immemorial, spanning 69,000 km^2 in southern British Columbia and into Washington State. Currently, the Syilx form eight member communities which are represented by the Okanagan Nation Alliance (ONA) (Melnychuk et al., 2017). While the Okanagan bands have not negotiated treaties with the province of BC, they play a significant role in water management, particularly concerning fisheries.

The Okanagan Basin is a major horticultural and agricultural center in British Columbia. Fruit orchards have gradually been replaced by vineyards making the area one of the top-producing wine regions. Early resource industry started with mining and has since shifted to forestry in the higher areas. Today, the main economy is retirement and commercial-based tourism, particularly for activities such as boating, watersports, wine tasting, local markets, hiking and biking (britishcolumbia.com). In fact, the fastest-growing industries are real estate, tourism accommodations and retirement-driven development.

Water resources in the basin are under increasing stress with rapid population growth and land use change. Areas of the basin are heavily regulated for urban water supply in addition to horticulture and other activities. Major issues center on water scarcity, pollution and invasive species, particularly the effects on fisheries. Climate change exacerbates these issues through increased weather variability and extremes. Agricultural irrigation accounts for 55% of the water use. Water scarcity results from both the natural dryness of the valley and a rapidly-growing human population with residential water demands and high daily use (two-three times the Canadian average of litres per person) (Melnychuk et al., 2017; cbc.ca, 2021). How climate change will affect water resources is an issue of utmost importance for the region.

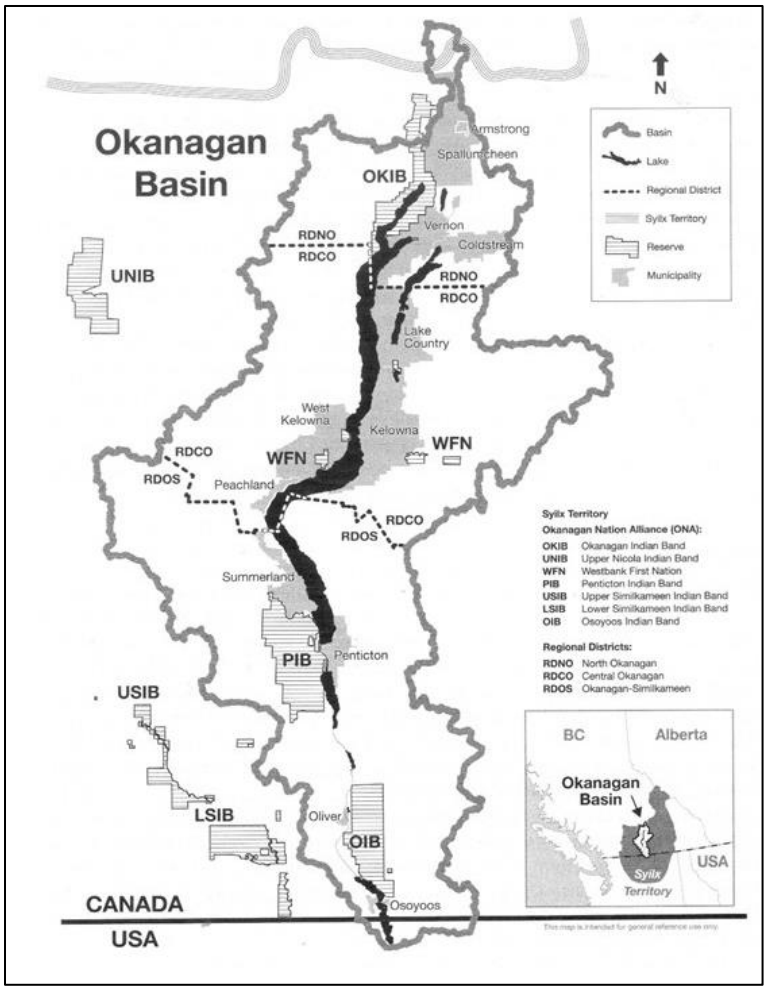

Figure 8. The Okanagan Basin, (Melnychuk et al., 2017).

History of The Okanagan Basin Water Board

In the early to mid-60s, water pollution in the Okanagan Valley became a serious concern. Poorly-treated sewage being discharged into the lakes and odorous algae blooms were spoiling public beaches and began to affect tourism, public health and enjoyment of the lakeshores (FBC, 2016). In 1965, the Okanagan Pollution Control Council was established by local government to address issues. Water pollution affected all valley residents and taking a whole-watershed perspective was at the leading edge of environmental science (obwb.ca). The Council gave advice on development proposals and lobbied senior government for action to protect valley lakes, in particular funding for wastewater treatment. The Council included representatives from 10 major Okanagan municipalities but lacked any legal authority or structure to make meaningful changes.

Water quality was only one of the many water concerns in the Basin. From the early days of wide-scale orcharding, water supply had been a limiting factor for growth and development. Other issues such as

the need to protect fish-bearing streams and limiting construction in flood prone areas also called for a watershed approach (obwb.ca). Recognizing the need for an inter-regional mechanism to collaborate, local governments and the province agreed to create an Okanagan Basin Water Board.

In 1969, the OBWB was established under the Municipalities Enabling and Validating Act and the Council was disbanded. Elected officials from the regional districts would be supported by a technical committee for water resource management. Through Supplementary Letters Patent legislation, the OBWB was given taxation authority to support projects and responsibilities for approving pollution discharge permits. The mandate provided was to promote shared water interests of Okanagan communities (FBC, 2016; Warwick Sears, 2022).

Shortly after their formation, the OBWB became a local partner on the Okanagan Basin Study, a federal-provincial initiative signed in 1969, aimed at improving all aspects of water management. In 1974, the study was complete with recommendations for water quality, supply and land use. Some recommendations (e.g., valley-wide floodplain zoning and recreational boating regulations) required regional districts and the province to delegate authority to the OBWB, which they were reluctant to do (FBC, 2016). Instead, the OBWB focused efforts on funding for upgrading sewage treatment and Eurasian watermilfoil control. In partnership with the province, these initiatives are ongoing and have proven successful.

Due to a dramatic expansion of the watershed's population, along with a study on the impacts of climate change on water supply, and a subsequent drought in 2003 (that created tensions between farmers and fisheries regulators), public concerns grew about the long-term sustainability of the water in the Okanagan Basin (FBC, 2016; obwb.ca). It was time to revisit and refresh the Board's original mandate in finding collaborative decisions. Thus, in 2006, the OBWB instituted an Okanagan Water Stewardship Council to provide technical advice from a range of experts. In addition, the Board added three Director positions to include representatives from the Okanagan First Nations, the Water Supply Association of BC and the Watershed Stewardship Council. In order to support research and raise awareness about water issues in the Okanagan Basin, the Board established the Water Conservation and Quality Improvement Grant Program (WCQI), (obwb.ca).

Organizational Structure and Governance – Okanagan Basin Water Board

Organization Description

The OBWB is a unique form of a collaborative governance organization that bridges three regional governments, 12 municipalities and several Okanagan First Nations reserves to coordinate water stewardship in the entire basin across six sub-watersheds. Its vision is for clean and healthy water in perpetuity, meeting the needs of residents and agriculture while supporting wildlife and natural areas – now and in the future (OBWB, 2016).

As an agency, the OBWB has many roles focusing on water concerns that affect the basin as a whole. It is a means to pool and direct funds to water activities through the coordination of projects, funders, communities, governments, universities and citizens. From the Governance Manual, the mandate of the OBWB is to provide leadership for sustainable water management to protect and enhance the quality of life and environment in the Okanagan Basin (OBWB, 2016). The Okanagan Basin Water Board promotes best water management practices through science, information, grants and other incentives. As every

resident in the Basin contributes financially to the OBWB, the focus is on projects and programs that benefit the Okanagan watershed as a whole (FBC, 2016).

The OBWB was legislated under the Municipalities Enabling and Validating Act, and by Supplementary Letters patent to the Okanagan Regional Districts, it has taxation powers to support actions. However, the OBWB is not a regulatory agency and does not enact or enforce any laws.

Okanagan Structure and Governance

The OBWB has twelve directors: Nine of the twelve are elected officials appointed by the three Okanagan regional districts (Okanagan-Similkameen, Central Okanagan, North Okanagan), which appoint three members each. The remaining three seats are dedicated to the Okanagan Nation Alliance, the Water Supply Association of BC and the Okanagan Water Stewardship Council (Figure 9). All directors vote and participate in all decision making except financial matters when only regional district directors can vote (FBC, 2016). An important distinction of the OBWB from other cases considered is that renumeration is paid to directors at the rate provided for meeting attendance by participating regional districts (OBWB, 2016).

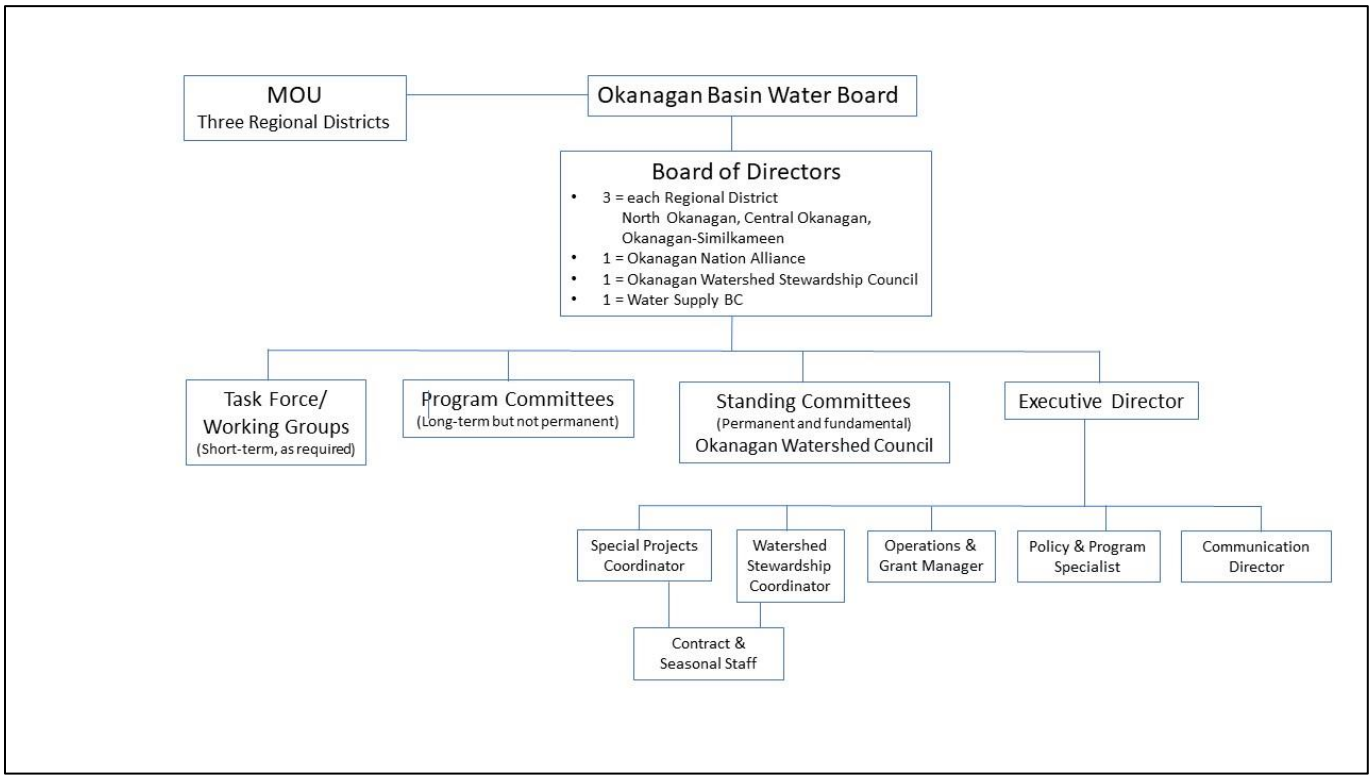

Figure 9. Generalized organizational structure of the Okanagan Basin Water Board (chart compiled from governance documents and Board of Directors meeting minutes)

The Watershed Stewardship Council is a broad-based advisory body to the OBWB and a communication liaison to water stakeholder communities throughout the Okanagan. Approximately 28 organizations belong including Regional Districts, Ministries of Agriculture & Agri-Food, Forests, BC Wildlife, BC Fruit Growers, Urban Development Institute and Environment Canada. To date, not a lot of businesses

participate, although some economic interests are represented in agriculture and fruit growers (Warwick Sears, 2022). It is a disparate group but they come tougher to learn from different perspectives and find common areas of agreement concerning the Basin. (Warwick Sears, 2022). In addition, the Council develops programs that contribute to the local knowledge base and provide stewardship tools for the watershed community.

At various times, program committees are in place for long periods to address OBWB business and programs. Similarly, task forces are struck when necessary to address specific issues in the short-term and then dissolved thereafter, upon completion of duties (FBC, 2016).

Currently, seven full-time staff run OBWB programs:

- Executive Director;
- Deputy Administrator;
- Operations and Grant Manager (part-time);
- Communications Director;
- Watershed Stewardship Director;
- Project and Planning Manager (open); and typically,
- Two or three Eurasian Watermilfoil Control Crew (obwb.ca; Warwick Sears, 2022).

Planning, Programs and Partnerships

Providing water leadership does not mean the OBWB assumes all basin water management responsibilities. Federal and provincial agencies, First Nations, regional districts, municipalities, irrigations districts, research institutes and non-government stewardship and advocacy organizations all play a role (Melnychuk et. al., 2017). The OBWB acts as a convenor to bring together local levels of government and other involved stakeholders to find collective solutions to water resource concerns. The direction of responsibilities is informed by the Okanagan Water Stewardship Council as a technical advisory group to the OBWB (Melnychuk et al., 2017; Warwick Sears, 2022).

For the first few decades of the OBWB, their services were mostly limited to watermilfoil control and the administration of a grant program to fund sewage infrastructure improvements. When the OBWB mandate was revisited in 2006, it recognized that addressing more complex water issues required a multi-faceted approach (Melnychuk et al., 2017). Since then, the OBWB has expanded their role into education, awareness, advocacy, water modelling and data collection and monitoring.

The work of the OBWB focuses on three broad program areas; 1) Collaborative Water Management; 2) Water Quality; and 3) Aquatic Weeds. Collaborative Water Management Program connects the dots between the people, the information, the policies and the plans we need to protect water in the Okanagan (obwb.ca). Program components include the Water Stewardship Council, Communication & Outreach, Water Science & Research and the Water Conservation & Quality Improvement (WCQI) grant program.

Water pollution was a driving factor for establishing the OBWB and continues to be an ongoing priority. Water quality issues in the basin can be challenging because many small pollution contributions can add up to larger problems. Source protection efforts fall into three categories: upper watersheds around lakes and streams on crown land; agricultural areas; and developed areas or stormwater management. Healthy riparian areas along streams and lakeshores, reducing sediment, runoff and chemical hazards

are integral in maintaining water quality. Three grant programs support various community projects: Water Conservation & Quality Improvement, Sewage Facilities Assistance and OBWB funding partnerships, such as research conducted by the University of British Columbia – Okanagan (UBCO), on emerging contaminates (obwb.ca).

The OBWB has been responsible for Eurasian watermilfoil control in the Okanagan Basin since the 1970s. After many years of experimenting with different methods, the OBWB now focuses on harvesting in the summer and rototilling the root system on shallow portions of the lake floor in the fall and winter (obwb.ca).

Various plans guide water management in the Okanagan Basin such as the historic 1974 water basin study, a current watershed plan, strategic plan, wetland action plan, etc. In addition, numerous reports and partnership projects throughout the watershed with provincial, regional and local governments and UBCO inform further actions such as:

- recent floodplain mapping following high water levels in 2017 and 2018
- report on flood policy and planning tools
- agricultural water supply communities project
- groundwater monitoring
- lake evaporation study
- hydrologic modelling
- water supply and demand (groundwater, stream flows, water use).

Social Infrastructure/Public Engagement

Trust and Cooperation

The OBWB works hard to maintain their role as a “trusted voice (Warwick Sears, 2022).” It is often considered an expert on issues, receiving contact from both media and residents throughout the watershed. At times, some groups may push for the Board to take a more active stance on issues but this typically stems from a lack of understanding of the OBWB mandate and role (Warwick Sears, 2022). Instead, the OBWB takes on an information and investigative role by applying for grants, researching and studying problems and communicating the results or recommendations suggested. Key to existing trust in the OBWB is the ability to remain a neutral integrator vs taking on any advocacy role on behalf of specific interest groups. In this manner, the Board maintains a healthy relationship with all vs alienating certain sectors or local government. Thus, it is better positioned to deal with complex and interjurisdictional issues (Warwick Sears, 2022).

Social Infrastructure, Community Involvement and Leadership

An important component in public trust is an effective communication strategy and transparency in actions. The OBWB posts all meeting minutes, decisions, actions and news releases on their website, including key research reports, annual reports, and strategic plans, along with links to partners, projects and sources of further information. The other piece is effective public outreach and use of social media tools aimed at helping the public understand water issues and encouraging collaboration and participation (obwb.ca).

Waterwise is the Water Board's outreach and education program. It aims to increase understanding of the connectivity of water including upstream, downstream, natural and human interactions. Education guides were developed for both the public and outdoor education programs which are aligned with BC education curriculum guidelines (obwb.ca; OBWB, 2022). As watershed issues arise, various campaigns are launched including pledges and competitions to conserve individual water use and actions to eliminate transfer of mussels to waterways. An AquaAction program hosts a seed funding competition for western provinces, to submit team project proposals addressing water issues for communities in the Okanagan. In 2021, $45,000 was awarded to teams from the UBCO and the University of Saskatchewan (USask), for mobile water filtrations systems, use of hydraulic systems in preventing cistern contamination and wastewater treatment to remove pharmaceuticals. Hosting of science forums and various education workshops further complement initiatives by the OBWB.

During the pandemic, the use of social media took on a more important role in communication. Website visits for community education programs rose 22% - 214% in 2021, representing 16,000-21,000 visitors with over half as first-time visitors (OBWB, 2022). This may also reflect the urgency of recent flooding in 2019 and severe drought in 2021.

Overall, the OBWB is really driving community education and partnerships, as well as resident participation.

Finances and Financing

Current Arrangements

Integrated Water Management at a basin level requires adequate, reliable and sustained financing (Melnychuk et al., 2017). Without consistent funding, long-term strategic planning and multi-year projects are nearly impossible. The OBWB was mandated under BCs Municipalities Enabling and Validating Act and granted the power of taxation through supplementary letters patent to the three Okanagan regional districts. With annual property tax assessments, local-based funding allows for attention to local issues without being beholden to senior government priorities or budget fluctuations from external sources (Melnychuk et al., 2017).

In 2022, revenue for OBWB was $4,818,136 with $3,635,327 (or 75.4%), received in levies from member Regional Districts. Contributions from North Okanagan were $646,724 (17.7%), Central Okanagan at $2,263,718 (62%) and Similkameen at $724,885 (19.9%) (OBWB, 2022) (Table 4). These numbers reflect the importance of levies in supporting the OBWB. A further $1,140,709 (23.6%) was received as grants, including provincial transfer payments and over $100,000 from in-kind services for the AquaHacking (Action) campaign, as well as office space at the municipal offices in Kelowna. As a quasi-government organization, there are seldom any donations as a source of revenue.

Table 4. Okanagan Basin Water Board financials, 2022 (OBWB).

Okanagan Basin Water Board
Statement of Financial Operations

For the year ended March 31	2022 Actual	2022 Budget	2021 Actual
Revenue (Note 10)			
Levies from member Regional Districts (Note 5)	$ 3,635,327	$ 3,635,326	$ 3,451,929
Grants	1,140,709	-	265,808
Interest and other income	20,403	9,400	15,094
Other income	22,376	-	-
	4,818,815	3,644,726	3,732,831
Expenses (Note 10)			
Aquatic weed control	778,869	809,100	670,962
Sewerage facilities assistance	1,314,702	1,314,476	1,330,077
Water management	2,314,565	1,701,950	1,940,204
	4,408,136	3,825,526	3,941,243
Annual (Deficit) Surplus (Note 10)	410,678	(180,800)	(208,412)
Accumulated Surplus, beginning of year	3,224,753	3,224,753	3,433,165
Accumulated Surplus, end of year	$ 3,635,431	$ 3,043,953	$ 3,224,753

Expenses incurred for water management were $2,314,565 (50%), sewerage facilities assistance at $1,314,702 (30%) and aquatic weed control at $778,869 (17.7%), totalling $4,408,136 (OBWB, 2022). In the first two expense categories, the OBWB administers grants under the Water Conservation and Quality Improvement Grant Program (WQCI) and infrastructure grants to upgrade sewage treatment plants and help communities move from individual septic systems to community sewers, matching provincial dollars (Melnychuk et al., 2017).

Challenges, Vulnerabilities and Future Financing

The power to pool local dollars and in-kind services to protect, maintain and restore the Okanagan Basin make the OBWB unique in the province of BC. It helps to address shared problems that would have been too costly for one jurisdiction. The base funding is not always adequate for all the work required in the basin and the OBWB regularly establishes funding agreements with senior governments for water science and policy. Similarly, partnerships with several post-secondary institutions provide research and data without incurring costs, as the academic research typically has funding in place (Melnychuk et al., 2017; OBWB, 2022).

The financial model of the OBWB could be considered a strength in its ability to consistently and effectively deliver its programs (Melnychuk et al., 2017). With funding through municipalities, no provincial money is received other than grants. As such, there are no strings attached to the province (Warwick Sears, 2022).

Following severe flooding in 2017, federal funding was available to local governments, but the OBWB was ineligible to apply. However, the member-District municipalities applied and were able to share funds with the OBWB (Warwick Sears, 2022). Ineligibility for some federal and provincial funding aimed at local government could be considered a weakness, particularly if it extends into other areas such as employment programs to enable seasonal or contract staff.

A legislated ceiling on the tax rate permitted by the OBWB ($0.036 per $1000 assessment), along with inflation and the desire of municipalities to keep tax increases at a minimum creates an area of limitation in funding. Any further increases in formulas must be agreed to by the electorate (Melnychuk et al., 2017).

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

Although not self-identified as an IWM entity, the OBWB demonstrates many components of IWM such as, basin management that considers economic, social and environmental factors; collaborating with a range of water stakeholders in planning and decision making; and an ecosystem approach that considers land-water, surface-groundwater, and upstream-downstream interactions (Melnychuk et al., 2017; obwb.ca). The OBWB is instrumental in leading, connecting, funding and facilitating basin-wide water management.

Apart from the value and accomplishments of the OBWB, challenges still exist. According to Melnychuk et al*.,* (2017), IWM challenges are both organizational and conceptual. From an organizational perspective, questions exist surrounding the limitations in engagement and decision making with the Okanagan Nation Alliance, due to unresolved rights, title claims and lack of capacity.

Conceptual limits of OBWB centre on water management capacity. Despite powers of taxation by OBWB, water management in the Okanagan is still carried out primarily by the province.

The OBWB exercises no direct authority, control or management responsibility over water levels, licensing or groundwater. Over the years, numerous proposals have been made promoting increased powers by the OBWB to include basin-wide management policies, licenses for water users, control of aquifers and institute water pricing (Nowlan and Bakker, 2007). However, governments have been reluctant to release control and it would require a shift in political norms and frameworks (FBC, 2016; Melnychuk *et al.*, 2017). Ultimately, greater formal authority is not a guarantee of influence or effectiveness and the OBWB views the ability to bring people to the table and gain trust as invaluable. In other words, “you might say our weakness is our strength (Warwick Sears, 2022).”

The OBWB makes working conditions, salary and benefits a priority in keeping staff over long periods of time. As a result, the OBWB has a long-term institutional knowledge and memory that extends across jurisdictions and geographical areas (Warwick Sears, 2022). It provides consistency and stability among agencies and residents.

Future Challenges

Continuing IWM in the Okanagan requires ongoing collaboration and adaptive management to mediate tensions among different human interests and environmental needs. Issues such as food security, residential development and the restoration of sockeye salmon runs all have water requirements and are long-term concerns (Melnychuk et al., 2017).

The Okanagan basin is one of the driest in Canada and climate change is exacerbating drought conditions. Demands for water and at times, conflicts over water will require ongoing communication and collaboration with the public and involved partners, to deal with inevitable trade-offs in the future. For instance, if licensing for irrigation is granted in certain areas, what will that mean for other areas in

the watershed. Unless the rate of residential water use is abated, further water scarcity is inevitable with increasing population and development in the Okanagan Basin (cbc.ca, 2021).

At the same time, climate change is causing flooding with extreme weather events. If water is released from the lakes in anticipation of flooding and it doesn't occur, then it is difficult for the lakes to return to normal water levels in preparation for drought (cbc.ca/listen/live-radio/1-63-the-current; 2021).

Similar to the other case studies considered, changes in policies, governments and priorities create future challenges. As an example, BC's recent Water Sustainability Act introduces groundwater licensing which has implications for the OBWB and water management, as it may put pressure on surrounding water sources already stressed.

In 2022, the BC government released a Watershed Security Strategy and Fund Discussion Paper. It focuses on efforts inside and outside of government to ensure water and watersheds are respected and valued for all they provide by securing sustainable funding for watershed management (engage.gov.bc.ca/govtogetherbc/consultation). Reconciliation with Indigenous peoples is foundational to this work. However, the OBWB is an entity of its own. Thus, while interested in developing terms of water governance and water security funding for activities in watersheds, the OBWB model, as part of the municipal districts, is unique and doesn't apply to other areas. Further, it is unclear whether there will be much impact on water source protection or any push for legislative changes. In the meantime, OBWB will continue focusing on local needs (Warwick Sears, 2022).

A further challenge includes labour shortages creating a lack of capacity in organizations, particularly government agencies, municipalities and First Nations Alliance. For example, after the flooding in 2017, provincial money was allocated toward floodplain mapping. That information hasn't been fully integrated into local by-laws due to frequent changeovers in staff and lack of momentum. In a move to make government smaller, civil servants were slashed and typically, provincial staff are paid less than municipal. As a result, there always seem to be a changeover in provincial staff and people are often lacking technical backgrounds or understanding of the watershed (Warwick Sears, 2022).

References Okanagan:

Cbc.ca/listen/live-radio/1-63-the-current; 2021. The Current – Sept. 21/22. Interview with BC cherry growers and Corrine Jackson, Communications Director with OBWB about drought in the Okanagan Valley.

Fraser Basin Council (FBC). (2016). Guidance for Collaborative Watershed Governance in BC: Discussion Paper (June 30, 2016). (Includes Cowichan, Okanagan, etc.)

Melnychuk, N., Jatel, N. & Warwick Sears, A. L. (2017). Integrated water resource management and British Columbia's Okanagan Basin Board. *International Journal of Water Resources Development, 33(3): 408-425.* In *Integrated Water Management in Canada: The experience of watershed agencies.* Shrubsole, D., Walters, D., Veale, B, & Mitchell, B.(eds.) Routledge, New York.

Nowland, L. and Bakker, K. (2010) Brief on BC Water Act Reform. Vancouver: Watershed Watch Salmon Society.

Nowland, L. and Bakker, K. (2007). Delegating Water Governance: Issues and Challenges in the BC Context. University of British Columbia Program on Water Governance.

Okanagan Basin Water Board (2022). Reviewing Connections: Annual Report 2022
Okanagan Basin Water Board. (2021). Waves of Change: Annual Report 2021.
Okanagan Basin Water Board. (2016) Governance Manual.
Okanagan Basin Water Board https://www.obwb.ca/overview/collaborative-water-management/
South Okanagan-Similkameen Conservation Program. (2017) Local Conservation Funds in British Columbia: A Guide for Local Governments and Community Organizations. (2nd ed.) Pentiction, BC.
Warwick Sears, A. (2022). Semi-structured Interview and Conversation with Anna Warwick Sears, Executive Director, OBWB, with S. Cooke and V. Hammond, report authors.

Online:
www.obwb.ca

Outlook for Watershed Management in BC

British Columbia is feeling the impact of climate change. During a five-month period in 2021, BC experienced a historic heat dome, severe droughts and devastating forest fires, followed by unprecedented flooding at the 100-year and 500-year flood levels. People lost their homes, drinking water was contaminated, farms were submerged, businesses were ruined, salmon runs were washed away, and wildlife habitats were destroyed (BC Water Legacy & ReFresh Water Lab, 2021; Tull, 2022a). The estimated cost of recovering from flood damage was over $9- billion and for firefighting, more than $500 million (Tull, 2022a).

In 2022, the BC government released a Watershed Security Strategy and Fund Discussion Paper. This came in response to increasing pressure on BC watersheds throughout the province. Framing the need for funding as "Water Security"' is being led primarily by BC water legacy. It envisions creating a fund, co-developed with First Nations, community groups and various partners, independent of government. It needs to be sustainable and at a scale that can make a difference (Tull, 2022a). The aim is to establish an endowment which would grow over time. The BC Watershed Security Coalition has identified at least $75 million annually is needed across the province.

The need to continue building public awareness (e.g., through campaign materials) in framing watershed security is essential to people, the economy and the environment (Tull, 2022b). Watershed security is paramount.

References BC:

Environmental Law Centre, University of Victoria (2017). Legal Basis for Enabling Watershed Authorities in BC. Prepared for the Okanagan Basin Water Board. Researcher, Alex McArdle.

Fraser Basin Council (2016). Guidance for Collaborative Watershed Governance in BC: Discussion Paper (June 30, 2016). (includes current examples, case studies – Cowichan, Okanagan, etc.)

Hunter, R., Brandes, O.M., Moore, M-L, & Brandes, L. (2014) The Cowichan Watershed Board: An Evolution of Collaborative Watershed Governance. Polis Project on Ecological Governance: watersustainabilityproject.

Nowland, L. and Bakker, K. (2010) Brief on BC Water Act Reform. Vancouver: Watershed Watch Salmon Society.

Nowland, L. and Bakker, K. (2007). Delegating Water Governance: Issues and Challenges in the BC Context. University of British Columbia Program on Water Governance.

Pisani, J. (2021) Organizational Arrangements for Watershed Governance on Vancouver Island: A Focus on Regional Roles and Relationships. MA Thesis, Faculty of Social and Applied Sciences, Royal Roads University, Victoria, BC. (includes case studies)

Tull, C. (2022a). BC's Unprecedented weather disasters require bold investment in watershed security. The Globe and Mail, OP ED, May 13, 2022. Toronto.

Tull, C. (2022b). Conversation with Coree Tull, Director, Government Relations and Engagement, BC Freshwater Legacy with S. Cooke and V. Hammond, report authors.

Online:
www.bcwaterlegacy.ca

Case Study – Ontario

The Province of Ontario has a world-renowned approach to integrated water resources management. The Conservation Authorities Act was established in 1946, to enable partnerships between the province and municipalities to undertake necessary activities supporting natural resources conservation and water management. Currently, there are 36 watershed-based non-profit organizations located, for the most part, in the southern part of the province where most of the population resides. This area is threatened by significant population growth, development and habitat loss. For a more in-depth analysis of Conservation Authorities, their benefits and challenges, see Mitchell et al. (2014) and Watson et al. (2019).

Notwithstanding the Conservation Authority model for watershed-based management of natural resources, there are other models in Ontario. Two examples in Ontario include the Severn Sound Environmental Association near Midland and the Bonnechere River Watershed Project near Renfrew, both as non-profit organizations. A deeper analysis of the Severn Sound Environmental Association follows.

Severn Sound Environmental Association, Ontario Canada

Larger Government Context

In Canada, roles and responsibilities are mandated by federal and provincial legislation and are shared among many government agencies and departments and municipalities.

The constitutional responsibility for water and natural resources lies with the province of Ontario, notwithstanding binational waters such as the Great Lakes. In Ontario, water and, by extension, watershed management are embedded within the Ministries of the Environment, Conservation and Parks, and Natural Resources and Forestry; however, other ministries do play a part in water management, including the Ministry of Agriculture, Food and Rural Affairs and the Ministry of Municipal Affairs and Housing through the Provincial Policy Statement. The management of natural resources and water tends to be siloed and continues to be fragmented in the province.

Ontario's Conservation Authorities (CA), play an important integrative role with municipalities and the province. There are only a few non-Conservation Authority watershed management organizations in Ontario, including the Severn Sound Environmental Association, a joint service board and the Bonnechere River Watershed Project.

Watershed management in Ontario has a deep history embedded in the creation of Conservation Authorities in 1946, through the Conservation Authorities Act. There are 36 CAs, most (31) in southern Ontario, with only five located in northern Ontario. Six principles guided the creation of Conservation Authorities: (Mitchell et al., 2014):

- A watershed is the geographical management unit
- Local initiatives so that local issues are addressed
- Provincial-municipal partnerships to share the costs
- A healthy environment supports a healthy economy
- Cooperation, coordination and collaboration are central to how work gets done

- Comprehensive viewpoint to facilitate integration

Watershed Profile

Severn Sound is a group of bays covering an area of approximately 130 km² located in southeastern Georgian Bay. The immediate watershed of the Sound covers an area of roughly 1000 km² with 20 subwatersheds, with the North, Wye and Coldwater subwatersheds being the largest. Severn Sound watershed is one of four watersheds, including the Lake Simcoe, Nottawasaga Valley and the Black-Severn River watersheds (Figure 10). There are seven major tributaries and four major inland lakes including Farlain Lake, Little Lake (Midland), Orr Lake and Bass Lake.

The watershed is predominantly (52%) forested with woodlands and wetlands, while agricultural activities are the second largest land use at 32% of the total land cover (South Georgian Bay-Lake Simcoe Source Protection Committee (SSSPC) 2015). Major wetlands include Tiny Marsh, Wye Marsh and Matchedash Bay.

The Severn Sound watershed encompasses a combination of small urban and rural areas with a permanent population of roughly 110,000 and a seasonal population of 300,000. There are three larger urban areas: the City of Orillia, the Towns of Midland and Penetanguishene. Smaller communities include Victoria Harbour, Port McNicoll, Elmvale, Coldwater, Hillsdale, Perkinsfield, Wyevale, Horseshoe Valley, Warminster, Orr Lake, Honey Harbour, and Port Severn (SSSPC 2015). The area includes First Nation and Métis communities, National and Provincial parks.

Municipal sewage plants serve nine small urban areas. There are numerous residences on private septic systems. Municipal water supplies include thirty-two groundwater systems and two surface water systems. The rural areas that have suitable soils are mainly agricultural (SSEA, n.d). The economy of the Severn Sound largely depends on tourism, agriculture, manufacturing and recreation (Sherman et al., 2018).

History of SSEA

Severn Sound Area of Concern (SSAOC) was listed mainly due to eutrophication and habitat loss resulting in fish community changes. As a result, the Federal and Provincial governments initiated a Remedial Action Plan (RAP), for Severn Sound. At the start of the RAP in 1986, the AOC included 19 lower and upper-tier municipalities (Sherman et al., 2018). Following a municipal amalgamation in 1997, the AOC watershed included eight lower-tier and two upper-tier municipalities.

Severn Sound RAP had a very strong collaborating team of government scientists and management staff. They shared data and information on the environmental issues presented in Severn Sound, including localized pollution, eutrophication, fish and wildlife community (biodiversity) and habitat loss (Sherman et al., 2018). The common goal was to remediate the Severn Sound cost-effectively using an ecosystem approach. Some consider an ecosystem approach as like, but not identical to integrated watershed management (Veale, 2011)

Sherman et al. (2018) noted that at the beginning of the collaboration in support of the RAP, the local municipalities in the area were not comfortable with the idea of a 'watershed,' and they were only vaguely familiar with the concept of assimilative capacity. Further, the "ecosystem approach" was lost to them as jargon. Consequently, communicating to the public took time and effort to explain the science.

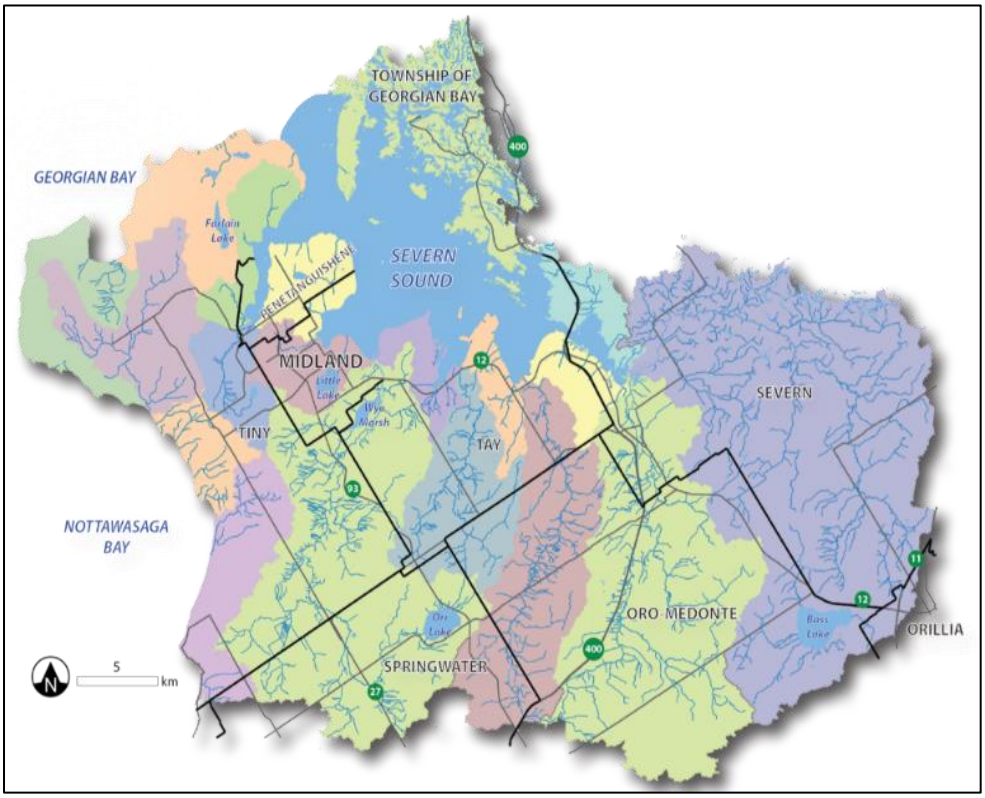

Figure 10. Severn Sound Watershed (SSEA n.d.)

In addition to strong collaboration among the scientists, the SSAOC had strong public engagement through the Wye Marsh Wildlife Centre, a community-based Education Centre. The Wye Marsh Centre Executive Director brought together community stakeholders, including municipalities, landowners, farmers and other interest groups, to establish a Public Advisory Committee (Sherman et al., 2018). The scientists and managers learned that encouraging meaningful public participation meant taking time and spending resources on informing the public and facilitating public input (Sherman et al., 2018). The public involvement program in the SSAOC became a driving force for community-based water use goals and objectives and obtaining consensus and commitments for remedial action, representing a significant shift from 'top down' to community-led and locally driven (Sherman et al. 2018).

The Severn Sound Environmental Association, a non-government organization, was founded as a partnership (non-legal entity) in 1997, through an agreement between federal, provincial and municipal partners to support the completion of the Severn Sound Remedial Action Plan (SSRAP) and to provide a local, community-based environmental office in the Severn Sound watershed (SSEA, n.d.).

In 2003, the Severn Sound Watershed was delisted from the International Joint Commission's list of Great Lakes Areas of Concern because it reached its goal of improving the water quality of Severn Sound (SSEA, 2009). As a result of delisting, both the Federal and Provincial governments started to step back from the collaboration.

Strong local leaders shared their concern about losing their progress in improving Severn Sound water quality. They leveraged the strong relationships among the municipalities and laid the groundwork for a simple partnership agreement to continue the monitoring and reporting requirements for delisting (Sherman et al., 2018). By 2009, the partnership agreement matured into a Joint Municipal Services Board under the Ontario Municipal Act (see Box 2).

Box 2 Municipal Services Board

The Ontario Municipal Act, 2001, two or more municipalities may enter into an agreement to create a Joint Municipal Services Board (section 202) or Municipal Services Corporation (section 203) for the purpose of undertaking activities or services collectively authorized by the municipalities (Henry, 2020).

Although the initial drivers to creating a community-led initiative were water quality and habitat loss, it also built a keen sense of place and a sense of ownership over the issues and corresponding solutions. Ultimately, the AOC and RAP process enabled local collaboration among people who developed a vested interest in the outcomes (Sherman et al., 2018).

Today, there is a strong recognition that the economy of this area depends on clean, safe water and healthy natural heritage and green space. The local community strongly recognizes that tourism depends on the clean waters of Georgian Bay.

Organizational Structure and Governance

In 2009, the Severn Sound Environmental Association transitioned from a broader collaboration/ partnership that included the federal and provincial governments to one that is a Joint Municipal Services Board (JMSB) under the Ontario Municipal Act. Under this Act (e.g., Section 202), a group of municipalities can create a partnership for various shared services. Using this legislative instrument, local Municipal leaders who wanted to maintain the progress achieved under the RAP transitioned the SSEA from a simple partnership to a JMSB (Cayley, 2022). Through the formation of the MJSB, the SSEA became a legal entity serving the local area (SSEA 2009). The current Agreement does not need to be renewed, and it lays out the core bylaws and operations of the Association for:

- Supporting the Municipalities in the management of their environmental activities,
- To continue to coordinate the Long-Term Sustainability Plan and
- To assume the duties and responsibilities assigned to the Severn Sound Protection Authority according to the Clean Water Act

A Letter of Agreement to create a JMSB was finalized in 2009 among nine municipalities (e.g., SSEA 2009). In 2016, one municipality withdrew their participation. Consequently, the SSEA currently consists of eight partnering municipalities (e.g., Midland, Penetanguishene, Tiny, Tay, Springwater, Oro-Medonte, Georgian Bay, and Severn). The Agreement outlines the following:

- Cooperation to address water quality issues in the Severn Sound area of Georgian Bay
- Support and implement a Long-Term Sustainability Plan intended to provide a vision for the social, economic and environmental health of the region

- Dependent on continued coordination of environmental services, including monitoring, consultation and project management
- Ensures cost-effective and efficient delivery of activities
- Recognition of the need for municipalities to work together
- Acknowledge SSEA's role in the Clean Water Act
- SSEA's Strategic Plan to guide its mission and priorities to respond to the environmental issues and concerns that are common to the municipalities.
- SSEA Business plan to outline the costs of operation and the proportion of the cost to be paid by each municipality through a funding formula based on the number of properties and their assessed values.
- The need for municipal bylaws to enable the MJSB
- Composition and procedures of the Board
- The activities of the Executive Director
- Administrative procedures
- Term of the Agreement

Today, the SSEA is a recognized non-profit organization that a Board governs with one elected member from each participating municipality. The eight Board members adhere to the Municipal Act requirements per the Ontario Ombudsman, SSEA Code of Conduct and Rules of Procedure for the SSEA Board. The SSEA also convenes the Source Protection Authority Board, and Agricultural Advisory Committee, a Municipal Climate Advisory Committee and an Invasive Species Working Group (Figure 11). The SSEA Board meets four times a year.

SSEA also partners with many other organizations, including the provincial and federal governments, to develop cost-effective environmental projects in the Severn Sound area that benefits the entire community.

The SSEA has a vision and mission and is guided by a Strategic Plan (2018) and a Business Plan (Cayley, 2022) (see Box 3). Annual reports are prepared as well as a financial summary. In 2022, the SSEA has seven full-time employees, four contract personnel and one part-time position. In addition, there can be several seasonal staff. In 2021, their core funding from the JMSB was about $875K, with additional revenues through grants and community and private donations totalling about $440K, resulting in an annual budget of about $1.3M.

Box 3 - Severn Sound Environmental Association

Vision: We see the future…Severn Sound will be the most resilient and thriving Great Lakes watershed.

Our mission: At Severn Sound Environmental Association, we are committed to ensuring exceptional environmental quality and exemplary stewardship of the Severn Sound area through sound science, collaboration and partnerships

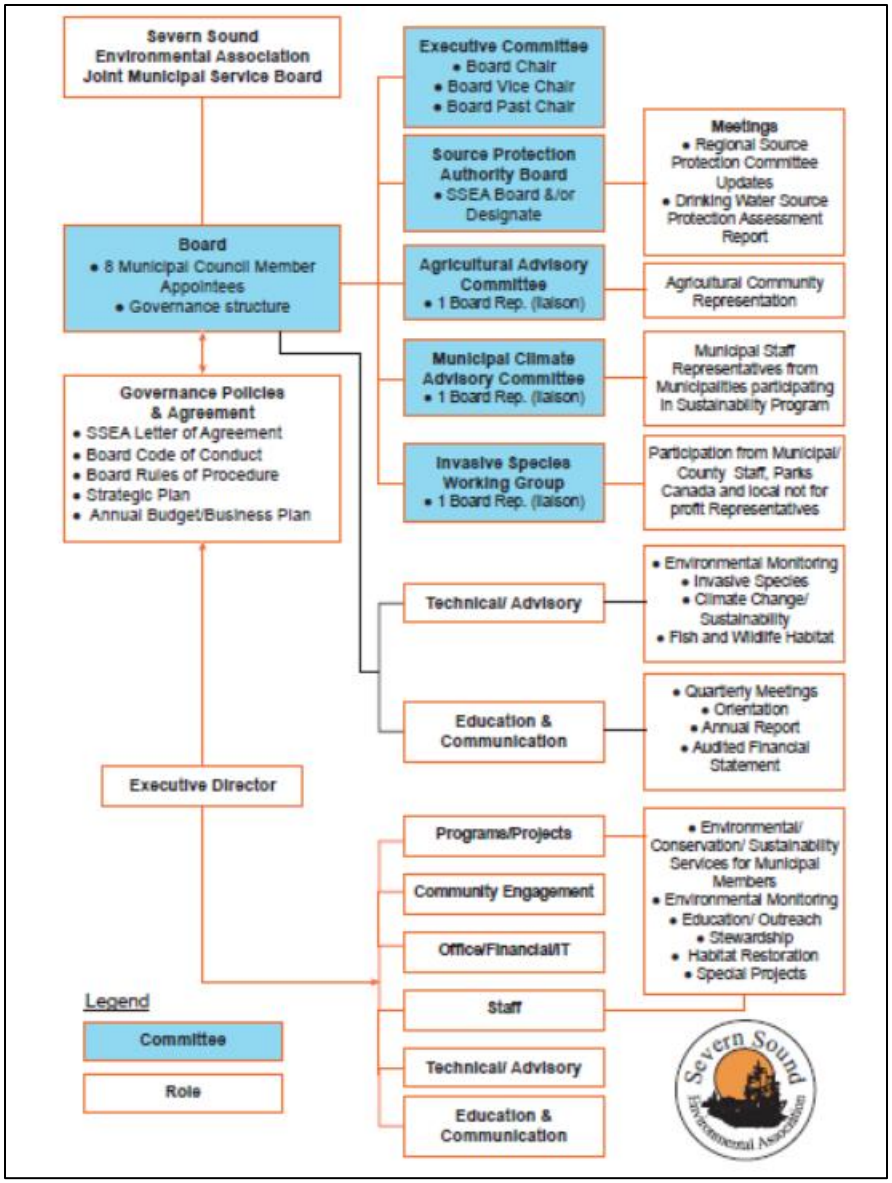

Figure 11. Organizational structure of the Severn Sound Environmental Association (SSEA, 2023).

Planning, Programs and Partnerships

In the beginning, much of the collaboration among the municipalities centred on the Area of Concern designation and the resulting Remedial Action Plan. It was these mechanisms that aligned the various actors in the region toward a common goal. Once Severn Sound was delisted as an AOC, local municipal leaders felt they risked losing the tremendous gains achieved by collaborating. Following delisting in 2003, creative local partnership agreements and financing were arranged to continue long-term implementation and to meet emerging environmental challenges (Sherman et al., 2018).

In the mid-2000s, SSEA facilitated a planning process to rally the community and align efforts toward a common goal/objective(s). The result was the Severn Sound Sustainability Plan (SSEA 2009). This Plan was built on the success of the Remedial Action Plan and the community visioning project by the North

Simcoe Community Futures Development Corporation called "Community Visioning and Action Plan: Picture This! Simcoe North 2000-2050. Our Plan for a Healthy Community."

By 2005, the SSEA Board of Directors and member municipalities decided to build on the success of both the Remedial Action Plan (RAP) and Picture This! and initiated a unique, collaborative process that would embark on ensuring the long-term sustainability of this valued asset – the Severn Sound watershed (SSEA, 2009). They acknowledge that a sustainable watershed means more than environmental protection and extends to economic vitality and community well-being.

To develop the Sustainability Plan, the community came together through their Sustainability Action Team (SAT). More than 50 members were participating from community organizations, government, business and cultural groups (Severn Sound Sustainability Plan, n.d.). The SSEA used a triple-bottom-line approach to integrate economic, environmental and social considerations to identify solutions for the community to maintain and increase the region's sustainability and ensure the gains achieved through the Remedial Action Plan were not lost. In 2009, the Severn Sound Sustainability Plan was completed and endorsed by nine partner municipalities. The fundamental principles of partnership, community engagement, leadership and stewardship guided this Plan.

Another community collaborative in the region, Sustainable Severn Sound (SSS), came together in 2015 to leverage the 2009 SS Sustainability Plan and develop an Implementation / Action Plan to catalyze climate change action. With support from the eight municipal partners and the and community, SSS emerged as the center for collaborative climate change action in the Severn Sound area and in 2018, released the area's first Local Climate Change Action Plan. The driver for this Plan was the commitment by the local municipalities to participate in the Federation of Canadian Municipalities (FCM), Partner for Climate Protection program (previously named FCM's Climate Protection Program).

Although both organizations were separate, many community members had difficulty distinguishing the difference between the two organizations. Following a strategic planning exercise, the SSS merged with SSEA. SSEA has integrated the Actions of the SSS as a special project which will allow for more capacity to realize this Plan. It also builds on the foundation of the work created by both organizations and drives further action for climate resiliency and adaptation. Moving forward, the SSS project will grow its climate-focused role and continue to add value for the SSEA's eight partner municipalities while complementing the core environmental services provided by the SSEA (SSSP, n.d.)

Severn Sound Environmental Association has several programs collecting data and information to support decision making by their local municipalities and partner organizations such as Public Health, provincial ministries, and federal departments. According to their website, programs include:

- Environmental monitoring
- Collecting water, climate and invasive species data to inform decision making
- Land and water stewardship
- Undertaking projects to help protect and build the resiliency of the Severn Sound area
- Planning and evaluation
- Provides land use planning and review and policy review and advice for their area municipalities, site plan reviews, and wetland evaluations using the Ontario Wetland Evaluation System. SSEA is also the Source Protection Authority for the SS watershed.
- Sustainable Severn Sound (a Project assumed by SSEA from Sustainable Severn Sound)

- A special project to advance the adoption of practices and policies within municipal operations to support climate change action, greenhouse gas mitigation and sustainable communities. It is the area's first Climate Change Action Plan
- Informing and Engaging Community
- Host various events and projects, including citizen science, to increase the engagement of the local community.

SSEA acknowledges the importance of partnerships. SSEA partners include a long list of organizations, First Nations, academic institutions, businesses, municipal and regional governments, and Provincial and Federal Governments. Their website captures a complete list (SSEA Partners, n.d.).

The Executive Director (ED), actively reaches out to establish strong relationships with a variety of key stakeholders in their area, including:

- Provincial ministries, e.g., MECP, Finance, etc.
- Support local municipalities with their advocacy on behalf of the SSEA
- Other not-for-profits and charities, including Couchiching Conservancy and the North Simcoe Soil and Crop Improvement Association
- Nature Conservancy of Canada,
- Local lake and cottage associations
- Local Frist Nations and Métis Councils
- Among others

Partnerships are very important to community organizations. Sherman et al., (2018) indicated that an important lesson learned by the RAP Team, and later by the SSEA Board, was always to recognize the efforts of community volunteers and contributors. Partner receptions became an annual event early in the RAP. These events are not costly but are very important in maintaining community support (Sherman et al., 2018).

Recent notable partnerships include other organized community groups such as the Sustainable Severn Sound. Although they were a separate initiative initially, through strategic planning processes, they established tighter ties with SSEA. Now SSEA serves as the custodian of the SSS Action Plan.

Social Infrastructure/Public Engagement

Trust and Cooperation

In the beginning, significant effort was invested in building strong partnerships and trust among the municipalities and other stakeholders through the development of the Remedial Action Plan. Sherman et al. (2018) recognized that meaningful public participation (and ultimately support and commitment), meant taking time and spending resources on informing the public and facilitating public input. Their emphasis on spending time and effort nurturing engagement with the public and other key decision-makers was one of the key elements of their success.

SSEA continues to build on the strong collaboration that underpins how they have approached environmental issues throughout its history. They have worked closely with their Board of Directors, municipal staff and members for over 23 years (Cayley, 2022). The SSEA has been the voice for the

watershed and watershed municipalities. They provide the eight municipalities with environmental advisory and program services designed to ensure the resiliency of the Severn Sound watershed. SSEA also acts as a connector with upper-level governments to ensure the interests of the watershed municipalities are reflected and represented. They work with landowners to advance ecological literacy and promote a shared ownership of the watershed. Through these actions, they build trust and cooperation with many stakeholders.

Social Infrastructure, Community Involvement and Leadership

With a clear vision articulated as "A healthy Severn Sound," SSEA recognizes the importance of community involvement and engagement as they have created a shared goal through which many stakeholders can align their efforts. Essentially, they have established themselves as community leaders for the watershed, sustainability and environmental services.

Much of their work centres on community and being a partner of choice and having an engaged and informed community is a goal of their renewed Strategic Plan. Further, SSEA acknowledges that much needs to be done through partnerships as no organization can do it all (Cayley, 2022). The organization recognizes the need for ongoing engagement of the community through stewardship activities, open house events, education and outreach, and public events (Sherman et al., 2018). Engagement is also done through honouring community members through the Severn Sound RAP Honour Roll.

Finances and Financing

Current Arrangements

As a Joint Municipal Service Board, the SSEA is funded, in part, by the local municipalities. SSEA leverages this base funding with grants and donations. They use an apportionment formula based on assessed properties in each partner municipality.

The 2021 budget for the SSEA is approximately $1.3M. Approximately 66% of their funding is 'core' and comes directly from the eight municipalities, and grants and donations make up the remaining 34% of the annual budget.

For example, grants and donations in support of their existing and expanded services include:

- Federal grant programs, including Canada Summer Jobs, ECO Canada and Science Horizons for summer students
- EcoAction for the special projects, e.g., the Wye River Healthy Soils & Water Quality project
- Trillium Foundation, in partnership with municipalities
- Biotalent for internship wage support
- Great Lakes Action Fund, administered by the Ministry of Environment
- Local community grants. e.g., County of Simcoe Forestry Grant/MOU
- Most of the budget services staff salaries.

Due to the governance structure of a Joint Municipal Service Board, one of the partner municipalities must take on the role of Treasurer. Tay Municipality currently fulfils this administrative role; however, the SSEA does maintain its own books and has an auditor. Tying into the municipality has significant benefits as many staff can access good employee benefits and a pension plan.

Challenges, Vulnerabilities and Future Financing

Although base funding is through municipalities, financial sustainability remains a core challenge. With the cost of living rising, the Executive Director has challenges providing wage increases for existing staff due to the desire of municipalities to 'hold the line' concerning additional funding. Another challenge that is not new to non-profit organizations, is the reliance on grants and donations. Further, accessing some provincial foundations, like the Trillium Foundation, is challenging given that they are a 'partnership of municipalities', which places them outside the eligibility criteria.

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

The SSEA remains quite flexible with what they undertake for their municipal partnerships. The SSEA is not bound to legislation and operates according to its Letter of Agreement with the municipalities.

Even though they are not a formal Conservation Authority supported by the Conservation Authorities Act, they tend to operate similarly and take on very similar activities such as water quality monitoring, municipal plan review etc. The Executive Director remarked that this allows for great flexibility (Cayley, 2022).

A primary strength of the organization is that the partner municipalities see them as trusted advisors and continue to support the JMSB. Municipalities use SSEA when questions arise in which they lack the expertise or capacity. For example, SSEA responds to blue-green algae reports on behalf of the municipalities and works with the Ministry of the Environment in responding to these concerns.

Some of the limitations of the SSEA are related to staff capacity, given that the SSEA is a small organization with a big vision for the SS watershed, so always balancing what can be done with what could be done is difficult.

Future Challenges

Severn Sound watershed is experiencing several challenges, including population growth and increased development. Additional staff are needed to complete the appropriate development reviews and to provide advice to local municipalities. Other challenges are climate change, responding to extreme weather events and preparing for environmental uncertainty. The region's changing demographics and the need for technology put pressure on the organization. Further, fiscal prudence and the need to contain costs are top of mind for municipal councillors. This challenge is also an opportunity as a Joint Municipal Services Board allows cost-sharing, which can save municipalities the cost of having SSEA's expertise within their municipality.

Severn Sound References

About Us (n.d.). Severn Sound Environmental Association. Retrieved October 14, 2022, from https://www.severnsound.ca/about/severn-sound

Bonnechere River Watershed Project (n.d.) Bonnechere River Watershed Project. https://www.bonnechereriver.ca/home

Cayley, J. (2022). Semi-structured Interview and Conversation with Julie Cayley, Executive Director, Severn Sound Environmental Association, with S. Cooke and V. Hammond, report authors.

Conservation Authorities Act. Retrieved from https://www.ontario.ca/laws/statute/90c27?search=Conservation+Authorities+Act

Henry, A.J. 2020. The Ontario Municipal Act SO 2001, C.25 and The Boards of Management for the Lake Huron and Elgin Area Water Supply Systems: A Discussion Paper. https://pub-southhuron.escribemeetings.com/filestream.ashx?DocumentId=26706

Mandelia, A. 2016. Great Lakes Areas of Concern: Life After Delisting. International Joint Commission Great Lakes Regional Office. https://www.ijc.org/en/great-lakes-areas-concern-life-after-delisting

Mitchell, B., C. Priddle, D. Shrubsole, B. Veale and D. Walters (2014) Integrated water resource management: lessons from conservation authorities in Ontario, Canada, International Journal of Water Resources Development, 30:3, 460-474, DOI: 10.1080/07900627.2013.876328

Ontario Municipal Act, 2001, SO 2001, C25 Retrieved from on November 14, 2022 https://www.ontario.ca/laws/statute/01m25#BK219

Partners. n.d. Severn Sound Environmental Association. https://www.severnsound.ca/about/partners

Severn Sound Sustainability Plan (SSSP) (2009) Severn Sound Environmental Association. https://www.severnsound.ca/Shared%20Documents/Reports/Severn_Sound_Sustainability_Plan_2009.pdf

Severn Sound Sustainability Plan. (n.d.). Severn Sound Environmental Association. https://www.severnsound.ca/programs-projects/sustainability-plan

Severn Sound Environmental Association Strategic Plan 2018-2023. (2018). Severn Sound Environmental Association. https://www.severnsound.ca/Shared%20Documents/SSEA_Annual/SSEA_Strat_Plan_20190607_Final_sec.pdf

Severn Sound Environmental Association (SSEA), 2009. Letter of Agreement to create a Joint Municipal Service Board, March 26, 2009. Retrieved from https://www.severnsound.ca/Shared%20Documents/SSEA_Board/SSEA_AGT_FINAL_MAR_26_2009_AS_AMENDED_2016.pdf

Sherman, K., R. Whittam, J. Cayley. 2018. Severn Sound Remedial Action Plan: The friendly little monster. Aquatic Ecosystem Health & Management 21 (4): 387–397. doi: https://doi.org/10.1080/14634988.2018.1528819

South Georgian Bay-Lake Simcoe Source Protection Committee (SSSPC). (2015). Approved Assessment Report: Severn Sound Source Protection Area. Chapter 2 Watershed Characterization. https://ourwatershed.ca/resources/reports-and-plans/assessment-reports/

Veale, B. (2010). Assessing the influence and effectiveness of watershed report cards on watershed management: A study of watershed organizations in Canada. (unpublished doctoral dissertation). Waterloo: University of Waterloo, Department of Geography.

Watson, N. D. Shrubsole, and B. Mitchell. 2019. Governance Arrangements for Integrated Water Resources Management in Ontario, Canada, and Oregon, USA: Evolution and Lessons. Water 11:663

UN WCMC Environment Program 2019. Terms: Ecosystem Approach. Retrieved from https://www.biodiversitya-z.org/content/ecosystem-approach.pdf

Case Studies – United States

Larger Governance Context – Water Management in the US

Water governance in the US is complex and fragmented. At the federal level, agencies oversee federal statutes, including the Clean Water Act, Safe Drinking Water Act, the Endangered Species Act, and the Harbors and Rivers Act and others. While federal laws provide overarching policy directives, each state supports their own water governance framework due to differing state government structures, policies and implementation measures (Dingfelder, 2017). Historically, state agencies have been organized along traditional resource use such as agriculture, energy, fish and wildlife, forestry, parks, state lands and water.

Elizabeth River Project, Virginia

Context

Watershed Profile – Elizabeth River

The Elizabeth River system is an estuary in southeastern Virginia. It consists of the Western, Eastern, and Southern Branches that flow through the surrounding towns of Chesapeake, Norfolk, Portsmouth and the western portion of Virginia Beach, where it originates (Giulo & Clark, 2015) (Figure 12). The region's total population is approximately 500,000, mostly in urban municipalities (Gavin, 2022: US census, 2021). The entire watershed is approximately 250 mi^2 (647 km^2), with much activity on the main branch in Norfolk (28.5 km^2). Forming the core of the Hampton Roads Harbour, the Elizabeth River depends heavily upon its tributaries.

The only natural freshwater source to the river is the Great Dismal Swamp in the southwest area. Wetland areas critical to the hydrology of the area provide habitat for wildlife, including black bear, bobcat, barred owl and pileated woodpecker (livingrivertrust.org). The waters in the area are home to 100s of species of fish, shellfish, herons, Atlantic sturgeon, and several shark species, as well as aquatic vegetation like wild rice. Forest cover consists of tupelo-bald cypress, maple-oak-gum, sweet gum-poplar, loblolly pine and Atlantic white cedar (cityofchesapeake.net; livingrivertrust.ca).

Tourism is a component of the economy, with many opportunities for boating, fishing, walking and biking trails and several nature parks such as Paradise Valley, a 40 ac (16 ha) waterfront park. Norfolk hosts the largest US military naval base and is one of two strategic locations for NATO. Shipping and docking yards, and harbour facilities, including a cruise ship docking area, are huge employers for the region.

Larger Government Context - Water Governance in Virginia

In Virginia, at least 12 state departments (e.g., Environment and Conservation, Environmental Quality, Game and Inland Fisheries, etc.) deal with water issues, ranging from water quality, shorelines, floodplains, point source discharges, and so on (Virginia Department of Recreation and Conservation, VDRC). On a local level, five or six others come into play, such as Soil and Water Conservation Districts and local governments or planning districts.

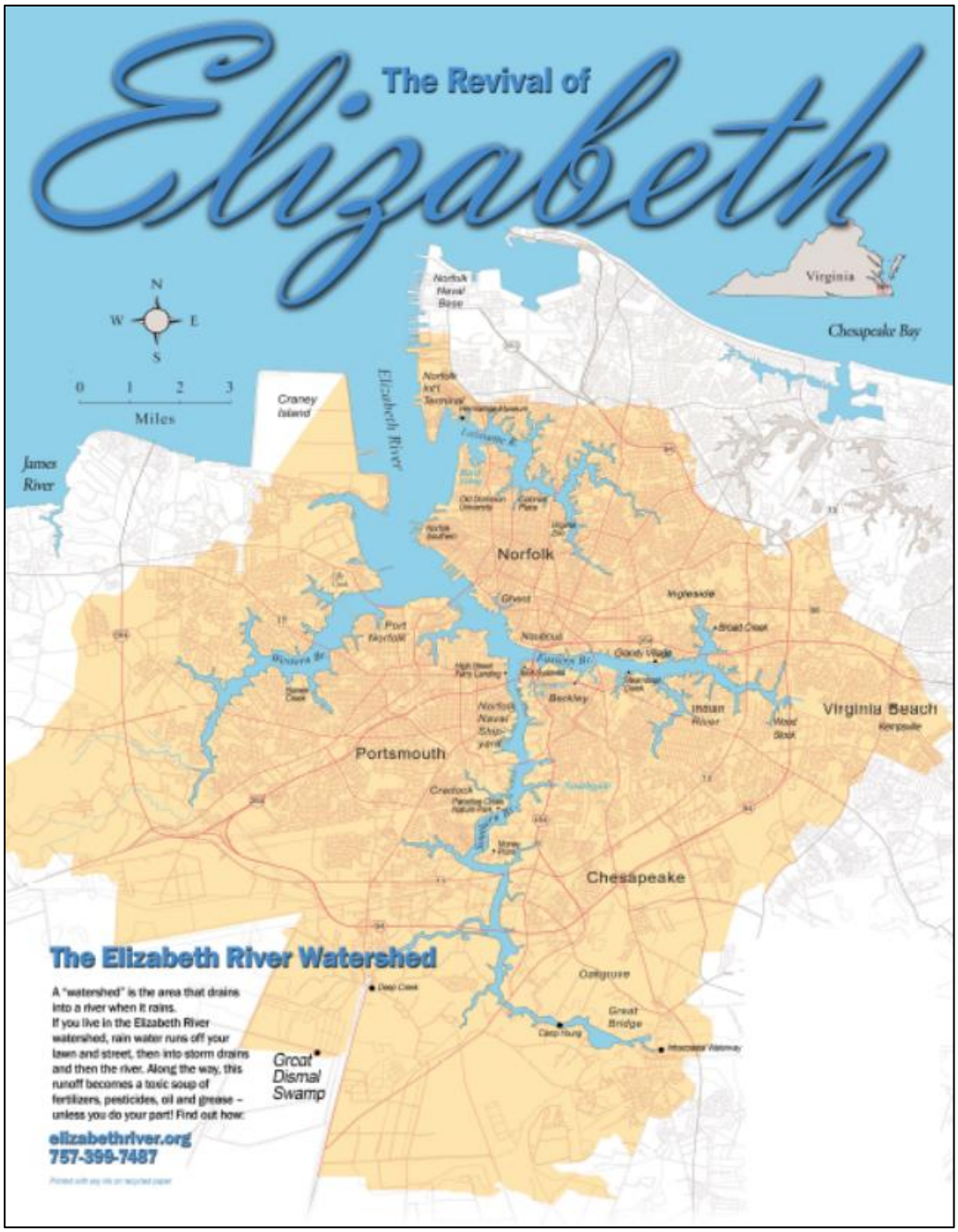

Figure 12. Elizabeth River, Virginia. (https://elizabethriver.org/teacher-resources/)

The Virginia Watershed Advisory Committee (VWAC), (a consortium of Virginia agencies, regional organizations and local government representatives involved in watershed management and restoration), offers guidance to municipalities and community groups in developing watershed plans. In addition, watershed roundtables are active in each of Virginia's 14 major river basins (VDRC). They act as forums that enable stakeholders to define critical basin-level needs, target significant water quality problems, provide input on management options and develop strategic watershed action plans (VDRC).

It is unlikely the Mid-James Watershed Roundtable would include the Elizabeth River further downstream. Until 2014, there appeared to be a Hampton Roads Watershed Roundtable which presumably would cover the Elizabeth River. It is unclear what if any role was played before and/or during the establishment of the ERP, if this still exists, or if it was consolidated with the Planning District and Elizabeth River Project (ERP).

Further, regulatory requirements such as Total Maximum Daily Load (TMDL) and stormwater provisions of the federal Clean Water Act are necessary inclusions in planning documents, and this responsibility is often shared across the state, local and community organizations. Local governments in Tidewater, Virginia must also address additional requirements to restore and protect water quality in the Chesapeake Bay through the Chesapeake Bay Preservation Act (VDRC).

In developing municipal planning documents, local governments must take all of these considerations into account, including a plan for stormwater management. The municipality can carry out developing watershed plans, or often, it falls to local organizations.

History of The Elizabeth River Project

In the late 18th century, the Elizabeth River was a prominent trade route with Europe, Great Britain and the East Indies. As a result, it was also a strategic battle site and later the location of a major naval shipyard. While commercial and military activities using the Elizabeth River provided numerous benefits for the region, it also had a series of negative impacts on the health of the estuary. The earliest, most dramatic effect was the clearing of old-growth forests, including riparian habitats lining both the main river as well as the other branches. Dredging of the river roughly doubled its depth, and filling reduced it by two-thirds of its original width, resulting in the loss of wetlands and shallows as critical habitat for marine organisms (Giulio & Clark, 2015).

The area's growth in the 19th and 20th centuries, including human population, industrialization, naval activities and shipping, contributed to substantial pollution. Nutrients and bacteria associated with municipal effluents, pesticides and storm sewer runoff, heavy metals and polychlorinated biphenyls (PCBs), from industries and creosote from wood treatment facilities were of great concern (Giulio & Clark, 2015). By 1925, the Elizabeth River was closed to the harvesting of oysters and clams due to contamination.

In 1940, the Hampton Roads Sanitation District was created. By the 1990s, the treatment of sewage and industrial waste, as well as the protection of wetlands and other sensitive river habitats, led to some improvements in water quality.

Due to the continued presence of a coal gasification plant and wood treatment facilities (the last to close in 1990), toxic hot spots of sediment contamination continued along the Elizabeth River. In 1983, the Environmental Protection Agency (EPA), singled it out as one of the most polluted rivers in the eastern United States, containing the first marine ecological dead zone, unlikely ever to be remediated.

However, a local journalist who resided along the water decided to try and clean up the River. In 1991, four concerned citizens met over a kitchen table and outlined a vision for creating an organization to bring the River back to life. In 1993, the Elizabeth River Project was founded as a non-profit organization using targeted restoration projects, public outreach and education to improve the health of the Elizabeth River.

The State of Virginia entered into an agreement with the EPA in 1995 after the Chesapeake Bay program identified the Elizabeth River as a "Region of Concern" in 1993 (Reynier, 2021; Dipasquale, 2015). One of the Elizabeth River Project's first achievements was developing a Watershed Action Plan in 1996. In 1998, the ERP secured a cost-sharing agreement among the federal government, the state and the Cities of Chesapeake, Norfolk, Portsmouth and Virginia Beach, for the US Army Corps of Engineers to begin a $2.4 million feasibility study to clean up the river bottom (Library of Congress, 2000).

Organizational Structure and Governance – Elizabeth River Project

Organization Description

The Elizabeth River Project is a non-profit organization leading the effort to restore the health of the urban river while affirming its value to the region's maritime economy (elizabethriver.org). The mission statement is to restore the Elizabeth River to the highest practical level of environmental quality through government, business and citizen partnerships (ERP, 2020). It relies on a large group of community partners from all walks of life and sectors to work together toward common goals.

Initially, the ERP concentrated on restoration projects. Over time, education played a larger role, and there is more of a balance between the two. The first program to launch was the River Star Program to engage businesses and industries in the best actions they can take, not only to prevent pollution but to help clean up the current conditions of the watershed (elizabethriver.org/river-stars). As of 2011, the program was extended to homeowners and schools.

The ERP works in an advisory capacity to local municipalities and landowners, relying on connecting to people through effective communication.

Elizabeth River Project Structure and Governance

The governing body of the Elizabeth River Project (ERP) is a Board of Directors with guidelines for no fewer than 12 and no more than 30 volunteer members (ERP, 2020). Currently, there is a 28-member Board of Directors, with four sitting as Executive Officers: President; Vice-President; Treasurer; and Secretary, along with the past-President and Chairpersons of Standing Committees (Figure 13). The backgrounds of volunteer Board members vary considerably, consisting of current or retired professionals, community leaders, industry executives, research scientists, financial planners and conservation agencies. The Board meets on a quarterly basis.

Five standing committees direct the detailed work of the Board, including:

1) Technical Policy - policies of the organization, public positions on technical matters with substantial potential impact on the health of the Elizabeth River, new technical programs, technical merit of substantive scientific reports;
2) Finance - oversight of the finances of the organization, including budgeting, audits and all financial reports;
3) Fundraising - securing unrestricted individual and corporate gifts at the Major Society giving level through personal requests;
4) Public Relations and Education – oversight of public relations, marketing and educational efforts of the organization; and

5) Board Governance – overseeing how the board manages itself, including nomination of board members and officers, board orientation, board engagement and board effectiveness review.

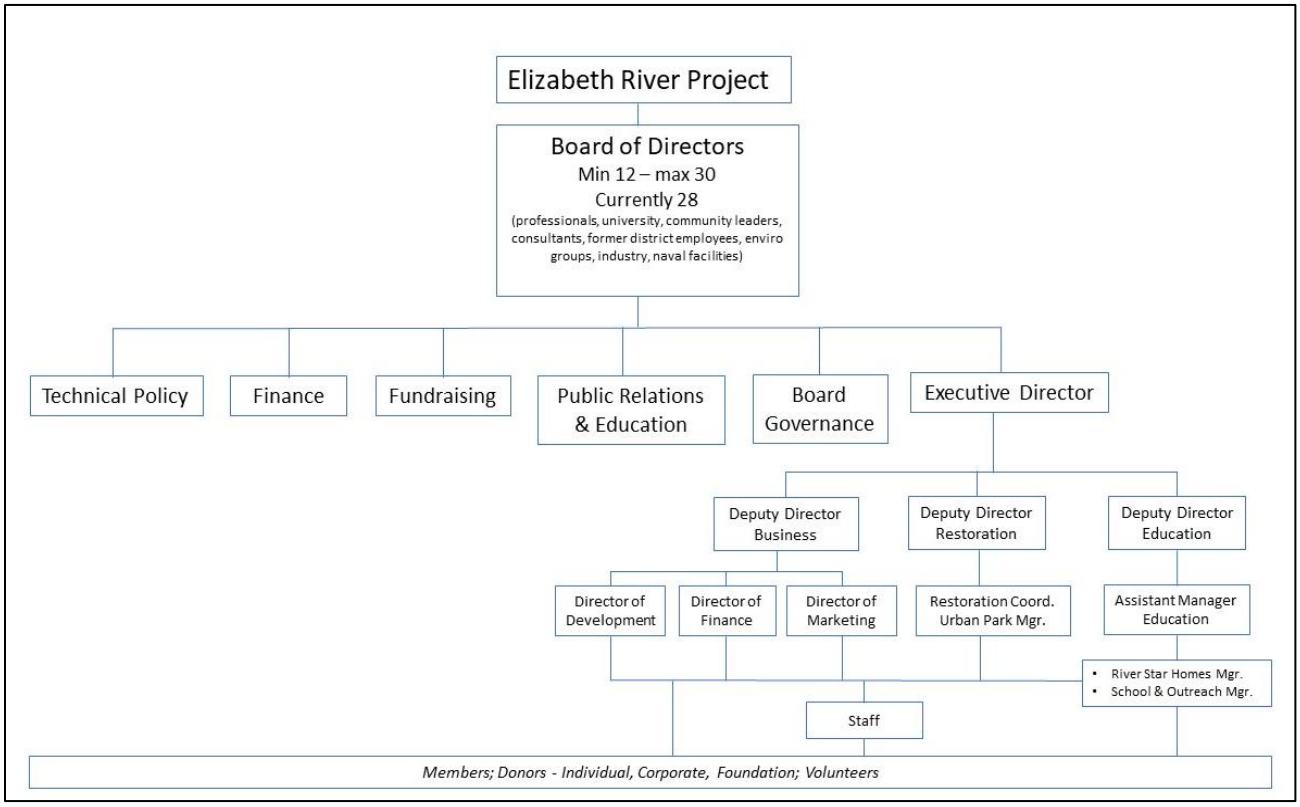

Figure 13. Organizational Structure of the ERP (as compiled from Terms of Reference, Staff Directory and Annual Reports).

Including the Executive Director, approximately 24 people are on staff, with numbers rising to 32 when including part-time and seasonal staff. Backgrounds range from geology, sediment clean-up, ecologists, landscape designers, funding development and educators (ERP, 2020; elizabethriver.org).

In 2004, A Living River Trust was established as the ERP recognized a need for more mitigation alternatives to offset the impacts of the Elizabeth River bottom. The Norfolk District of the Corps of Engineers, the Virginia Department of Environmental Quality, and the Trust's Board agreed on operating guidelines. The Living River Restoration Trust allows developers different approaches to offset environmental impacts that cannot be avoided by achieving as many benefits as possible to the Elizabeth River ecosystem. Currently, the Fund is primarily expended for projects to clean up contaminated river bottoms. The ERP helped set up the trust and provided contracted support until they could operate independently (livingrivertrust.org).

In 2010, the Trust added a second focus, becoming the only locally-based land trust in the Elizabeth River watershed. It concentrates on smaller, urban parcels that may not be of value to the state and national land trusts, particularly sensitive riverside lands. In an urban watershed, open space is rare and important (livingrivertrust.org).

Planning, Programs and Partnerships

Since 1996, the Watershed Action Plan has been updated every six years to reflect changing conditions and priorities within the watershed, particularly because of climate change and sea level rise. In developing the plan, the ERP collaborates with over 100 river stakeholders, including industry, community members, reservoir managers and state and local governments. The ERP uses data to inform restoration projects from the Virginia Department of Environmental Quality, Virginia Institute of Marine Sciences, EPA and field observations (e.g., sediment samples, elevation measurements). Monitoring is largely related to water quality and biotic activity.

In addition to restoration work, the ERP acts as a formal pollution prevention advisory for regional industries, government and citizens. It established the River Star Homes and Businesses Program, which encourages industries and homeowners to improve on-site river and riparian habitats and reduce on-site nutrient loads coming from their land. The River Star School Project brings STEM (Science, Technology, Engineering & Math), curriculum and river education to local youth through instructional packages for teachers and education outreach. The Learning Barge is a floating laboratory that provides education programs to thousands of people, both the general public and more specifically, embedded in the elementary curriculum to include every Grade 4 student enrolled in area schools.

In all of its work, the ERP engages with various partners to achieve goals and activities identified in the Watershed Action Plan. Key partners include the National Oceanic and Atmospheric Administration, Environmental Protection Agency (EPA) Region 3, National Fish and Wildlife Foundation, local cities and municipalities, Virginia Department of Forestry and Virginia Port Authority. The Hampton Roads Planning District Commission is essential to the success of the ERP. It provides coordination of various municipal departments and other agencies to plan and implement remediation and restoration projects.

The ERP has successfully worked with non-traditional partners such as Virginia Dominion Power, a riverside coal power company. The Power Company has funded many outreach and education projects to reach diverse groups of students. Further, the utility actively participates in the River Star Program for businesses and leads several sustainability efforts. The ERP credits its success in working with diverse stakeholders to focus on on-the-ground solutions to local problems while leveraging opportunities.

The area is well-saturated with local universities, so there are numerous opportunities for partnerships, research, expertise and so on to increase the organization's capacity.

In 2014, the ERP issued a 'State of the River' report assessing the health of each of the river branches. The success of the previous 20 years was clear in removing 36 million pounds of contaminated sediment, increasing fish species and dropping disease lesions in indicator species from above 40% to near background levels (Dipasquale, 2015). In recent years, the Elizabeth River has seen the return of brown pelicans, otters, dolphins and bald eagles, all indicators of improved water quality (Gavin, 2022).

Social Infrastructure/Public Engagement

Trust and Cooperation

Due to a long and successful history of numerous partnerships and projects, the ERP has become a respected voice in the community. The organization has gained a solid reputation for following through on actions (Gavin, 2022). This takes many years and countless meetings with different stakeholders, not

as adversaries, but as collaborative partners, to establish a working relationship and find common ground. Over time, the ERP has created momentum and capacity through the collection of efforts by community members, businesses, governments, students, educators and public servants working together (elizabethriverproject.org).

Social Infrastructure, Community Involvement and Leadership

The ERP relies on the power of community partnerships – rather than lawsuits and finger-pointing- to accomplish restoration goals (elizabethriver.org). That philosophy and leadership in bringing together public agencies, private businesses and non-profits became a model for collective action and led to the Stanford Social Review to cite the ERP as one of the country's best examples of convincing disparate interests to work together on a community project (Kania & Kramer, 2011). The ERP uses process of Collective Impact, most often used in the social sciences sector, where diverse groups come together to solve complex problems. Typically, there are five criteria to guide the process:

1. Common agenda: the need to find common ground among different objectives of corporations, governments, community groups, and local citizens to establish workable cross-sector initiatives;
2. Shared Measurement Systems: the need to develop agreement on the ways success will be measured (i.e., the criteria or indicators that will be used) and how that will be communicated to all;
3. Mutually Reinforcing Activities: the use of strengths of each organization to contribute to ways it excels that support the actions of others. A coordinated effort of different activities takes place through a reinforcing plan of action (e.g., participants in the ERP action plan agreed to 18 -point water restoration plan, but each organization plays a different role);
4. Continuous Communication: the importance of open and ongoing communication as the basis of trust. It takes years to build experience with each other to appreciate the common motivation.
5. Backbone support organization: the requirement of a separate organization and staff with specific set of skills to serve as the backbone of the entire organization. The expectation that collaboration can occur without a supporting infrastructure is one of the most frequent reasons it fails (Kania & Kramer, 2011).

The collaborative impact model has enabled the ERP to tackle a scope and complexity of problems that might otherwise prove formidable. The ERP also recognizes that people of colour disproportionately have borne the impacts of pollution across the country. ERP is committed to addressing these inequities as fundamental to the watershed action plan. On their website is an interactive environmental justice mapping tool, which illustrates social demographics, household income, etc., with layers indicating flood-prone areas, trail access points, pollution discharge locations, restoration projects, superfund sites, greenspaces, etc. This allows planners, non-profits and community partners to incorporate environmental justice matters into their planning and projects.

Finances and Financing

Current Arrangements

The financial information provided is taken from the 2020 financial statements provided online (causeiq.com, a web-based information tool on non-profit management, including form 909 tax returns for non-profit/charitable organizations in the US).

The ERP typically operates with a budget of approximately $2 million (Gavin, 2022). Leading up to 2021-2022, the budget for the ERP was much higher, at approximately $8 million, representing a capital campaign and major donations towards the construction of a Resilience Lab, designed to research, identify and plan for sea rise related to climate change and extreme weather events.

The main source of funding for the ERP comes from a variety of grants both from the community and from various levels of government. The 2020 return shows Federal grants accounted for approximately $500,000, primarily from the EPA for the Chesapeake Bay Program. The National Fish and Wildlife Foundation contributed approximately $517,000 in various conservation funding. Program revenue for ERP, including fee for service from landowner consultation, is approximately $105,000. The organization holds an endowment of approximately $600,000.

Each of the 3-4 member municipalities appears to contribute approximately $100,000 to the ERP. It appears to be voluntary rather than assessed through a levy. $500,000 in federal/state funding is earmarked over a period of 5 years as a residential cost-sharing program.

Expenditures for the ERP were approximately $2.4 million dollars. Major items included $1.1 million in employee salaries and benefits, $185,000 in restoration projects (ERP share), $100,000 for officers/directors of the board, $150,00 in office occupancy and expenses. Approximately $63,000 was spent in education and promotion, and notably, professional services for fundraising accounted for $75,000.

The ERP relies heavily on donations from foundations and private philanthropic citizens in amounts ranging from a few thousand dollars to over $500,000. From their most recent newsletter, ERP has a membership of 400-450 people. Members do not have voting rights but periodically, general membership or update/information meetings may be held.

Challenges, Vulnerabilities and Future Financing

Many challenges remain for the Elizabeth River and area. While water quality has improved, it remains a concern, particularly in the branches of the Elizabeth. Climate change, sea rise, and invasive species are ongoing and future challenges at a scale unknown.

Like many organizations, the ERP is looking to enhance its public and foundation donations as a greater source of revenue. They realize any dependence on federal and state funding is vulnerable to changing rapidly through socio-economic or political circumstances and is not a long-term, guaranteed funding source.

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

Community Capacity is considered a strength of the ERP. The watershed plans are developed *for the community by the community,* with the Elizabeth River as the common motivating factor. Trust has been

the most essential factor in building capacity across diverse community sectors. Stakeholders and partners are the most important asset, particularly in urban restoration; they need to be valued and empowered (Gavin, 2021).

One of the challenges experienced by the ERP relates to equity and service across the watershed. For example, most often, affluent areas or landowners approach the ERP for assistance on their own property. In addition, Maryland tends to get a lot of attention. It has numerous organizations so the ERP can get left out of discussions, particularly with their location at the bottom of the Chesapeake Bay. There needs to be more recognition of upstream and downstream relations, both ecological and human (Gavin, 2022).

Future Challenges

Climate change is one of the most pressing issues in the area. Sea level rise and storm surge events affect the basin, including the smaller tributaries and wetland areas further inland. In recent years, wetland restoration has helped to ameliorate some impacts thus far.

Through a rolling conservation easement and monetary backing, the ERP is currently constructing an $8 million headquarters and resilience lab located in a floodplain and designed to be submerged in the coming decades. It will serve as a living laboratory in how the community continues to live with rising sea levels, including a mechanism to address changing ownership of coastlines when land becomes inundated with water. Eventually, the building will be demolished, utility connections removed, items recycled, and the site abandoned. Perhaps illustrating some similar and difficult decisions for landowners in how nature may reclaim the land and how humans can prepare and protect water resources in the process.

Other challenges involve engaging young people of colour. The ERP is working with local education programs to provide those students with fewer opportunities and a work placement for training (e.g., a certificate program in landscaping).

References Elizabeth:

Dipasquale, N., (2015). Elizabeth River Project shows the power of local action. Chesapeake Bay Program, EPA. Director, Nicholas Dipasquale. (chesapeakebay.net/news/blog).

Elizabeth River Project (2016) Star Power: Toward a Thriving Urban River. Twentieth Anniversary Watershed Action Plan for the Elizabeth River, January 28, 2016. Virginia, US.

Elizabeth River Project. (no. date). Sustaining a National Model for Collective Impact on the Elizabeth River. Full proposal to National Fish and Wildlife Foundation

Elizabeth River Project. (2020). Public Discloure Copy. Return of Organization Exempt from Income Tax.

Elizabeth River Project (2022). Our Elizabeth: The Updated Strategy for Community-wide Action to Restore the Elizabeth River, v – 2022. Virginia, US.

Elizabeth River Project and Virginia Institute of Marine Science. (2020). State of the Elizabeth River Scorecard.

Gavin, B. (2022). Semi-structured Interview and Conversation with Barbara Gavin, River Star Homes Program Manager, Elizabeth River Project, with S. Cooke and V. Hammond, report authors.

Gavin, B. (2021). How the Elizabeth River Project Uses Collective Impact to Restore One of Our Nation's Great Rivers.

Giulio, R. & Clark, B. (2015). The Elizabeth River Story: A Case Study in Evolutionary Toxicology. *Journal of Toxicology and Environmental Health: Critical Reviews 18(6):259-298.*

Kania, J., and Kramer, M. (2011). Collective Impact. Stanford Social Innovation Review. Winter 2011.

Library of Congress. (unknown). Elizabeth River Project. *Local Legacies: Celebrating Community Roots*. Retrieved from https://memory.loc.gov/diglib/legacies/loc.afc.afc-legacies.200003606/default.html

Morrison, J. (2022). Meet the multi-million-dollar building deliberately built to drown. *The Washington Post: Climate Solutions, Oct. 12, 2022.*

Spark Policy Institute of Denver, CO and ORS Impact of Seattle, WA. (2018) When Collective Impact has an Impact. (A cross-site study of 25 collective impact Initiatives).

US census. (2021). United States Census Bureau www.census.gov

Reynier, W. & Gregg, R. (2021). Climate-Informed Watershed Restoration on the Elizabeth River. Case Study on a project by the Elizabeth River Project). Version 2.0. Product of EcoAdapt's State of Adaptation Program. Retrieved from Climate Adaptation Knowledge Exchange (CAKEX). www.cakex.org/case-studies/climate-informed-watershed-restoration.

Virginia Department of Recreation and Conservation (VDRC) (Date? – post 2010). Local Watershed Management Planning in Virginia: A Community Water Quality Approach. Virginia, US.

Online:

www.causeiq.com (a web-based information tool on non-profit management, including form 909 tax returns for non-profit/charitable organizations in the US)

www.cityofchesapeake.net

www.elizabethriver.org

www.livingrivertrust.org

Long Tom Watershed Council, Oregon

Context

Watershed Profile – Long Tom

The Long Tom watershed is located west of the Cascade Mountains in Oregon. It is subject to a moist, marine climate, in contrast to the high desert area in the eastern part of the state. In addition to the coastline, Oregon's many rivers and lakes make it known for its water and natural beauty (Thieman, 2000).

The Long Tom River is a major tributary of the Willamette River, the largest in the state, and the valleys represent an agriculturally rich area. The Long Tom Watershed encompasses ten sub-watersheds covering approximately 106 $km^{2,}$ and a wide range of land uses (Figure 14). Urban use includes the City of Eugene, a high-density urban center of approximately 176,600 people (2020 US Census), and smaller towns such as Junction City, Vanetta, Monroe and some rural settlements. The majority of land use is private forest (44%) and agriculture (33%) (Flitcroft, 2009). Agriculture is among the most diverse in the state, spanning over 140 commodities and ranging from small organic farms to larger conventional farms of hundreds of acres (Flitcroft et al., 2009; longtom.org).

Approximately 12 mi (19 km) west of Eugene, the Fern River Reservoir is a heavily-used recreation area popular for boating, fishing and birdwatching. Built-in 1942, the Fern River Dam was constructed by the Corps of Engineers primarily for flood control, irrigation and downstream river quality. Additionally, channelization and levees were constructed below the dam to the river mouth (Thieman, 2000). Surrounding part of the Reservoir is a wildlife management area representing a unique habitat for various species and a wintering ground for waterfowl.

Larger Government Context - Water Governance in Oregon

Interest in developing a catchment-based approach to water management in Oregon arose during the late 1980s in response to endangered salmon populations. At the time, there was a preference for voluntary and community-based efforts toward river restoration rather than direct government intervention (Watson et al. 2019).

In 1987, a Governor's Watershed Enhancement Board (GWEB) was established to provide training and financing to improve riparian habitats. By the early 90s, provision was made for the establishment of watershed councils to conduct assessments, develop action plans and monitor ecosystem health. These were conceived as non-governmental organizations recognized by county-level governments (Watson et al., 2019).

In 1997, state leaders recognized the importance of salmon to state culture, economy and recreation and as an important indicator of watershed health. Increasingly concerned over salmon populations and in trying to avoid placing a commercially important fish under the Endangered Species Act, the state government launched the Oregon Plan for Salmon and Watersheds (oregon.gov/oweb; Flitcroft et al., 2009). The plan outlined specific actions to address factors affecting fish populations and watershed health. Most of the actions focused on water quality, stream flows, and habitat restoration.

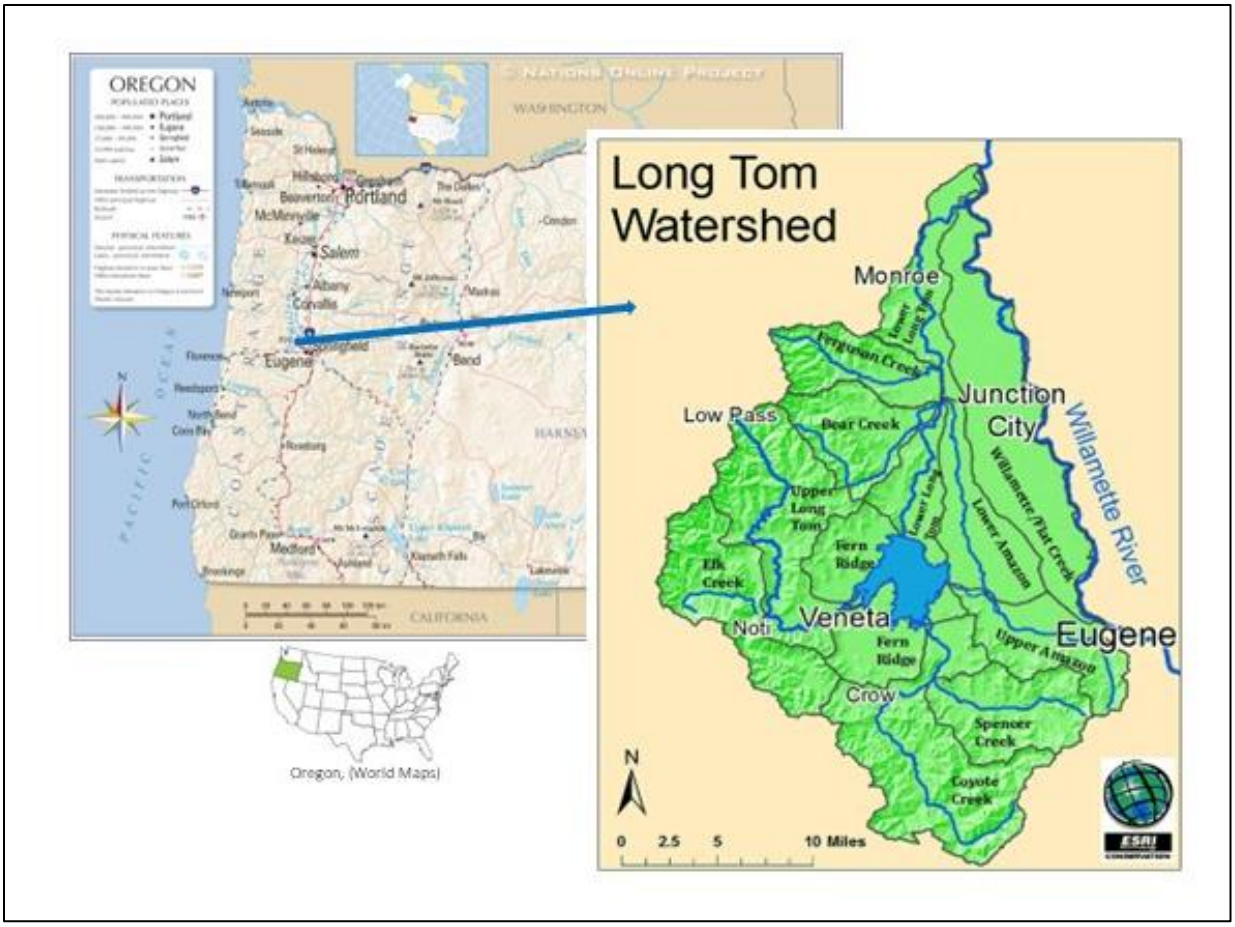

Figure 14. Long Tom Watershed, (LTWC, ontheworldmap.com)

In 1999, the GWEB was replaced by the Oregon Watershed Enhancement Board (OWEB) to promote and fund voluntary actions that strive to enhance Oregon's watersheds. The OWEB is a state agency that provides grants to help Oregonians take care of local streams, rivers, wetlands, and natural areas (oregon.gov/oweb/about-us/Pages/about-us.aspx). In particular, programs to restore salmon, improve water quality and strengthen ecosystems (OWEB, 2008). The OWEB became a funding body offering grants to support watershed councils and other entities throughout the state.

In August 2012, the State of Oregon's Water Resources Commission published Oregon's first Integrated Water Resources Strategy (IWRS), including recommendations for place-based integrated water planning, collaboration and public involvement. Draft guidelines were published in February 2015, and an agreed-upon IWRS for Oregon was published in 2017 (Watson et al., 2019). In the meantime, local watershed councils continued to develop. There are 90 watershed councils throughout the state, with two-thirds (60) meeting OWEB criteria for funding (Dedrick, 2022).

History of The Long Tom Watershed Council

In 1997, residents of the Upper Long Tom sub-basin met to discuss forming a watershed council. A diverse group of stakeholders, including farmers, foresters, anglers, businesses, scientists, and conservationists, responded to the opportunity to act locally and cooperatively to address land and

water issues under the Oregon Plan for Salmon and Watersheds (longtom.org), supported through the Oregon Watershed Enhancement Board. Initially, over 80 people joined conversations at various times, eventually growing to over 300 attending different presentations and public meetings.

By March of 1998, interest in the Long Tom peaked and it was at this time that an open call was put out, in a meeting of over 70 people, for volunteers to set up an Interim Steering Committee to plan regular monthly meetings that included business and education topics. In addition, volunteers formed a Charter Team, and began writing the Watershed Charter (see Appendix E). A planner from Lane County provided secretarial assistance. By late 1998, the Long Tom Watershed Council was established.

At that time, both Lane County and Benton County prepared an order/resolution to provide official recognition of LTWC as a voluntary watershed council. Benton County in particular, encouraged LTWC to develop and implement a watershed action program and requested an annual report to the County (longtom.org).

Initially, a Watershed Coordinator was hired to oversee the operations of the LTWC and to network within the watershed and state-wide. A water quality monitoring program was established, and in 2000, an assessment of the entire watershed, including soils, water flows and quality, vegetation, natural areas, etc., was completed. A Steering Committee governed the organization and reported to the OWEB. In 2007, the LTWC became a registered non-profit, and a typical board structure was embedded.

Within 11 years of establishment, the LTWC council had generated baseline data, more than 50 restoration projects and a conservation strategy to guide future action. In 2009, LTWC was named a model watershed and awarded a 10-year grant for over $1 million to increase the pace and scope of their work.

For a description of the history of the Long Tom Watershed, see Appendix F for a timeline of major events from 1997 to 2012.

Organizational Structure and Governance – Long Tom Watershed Council

Organization Description

The Long Tom Watershed Council (LTWC) is a local community, non-profit organization of diverse participants committed to clean water and healthy habitats in the Long Tom River basin. The following mission statement can be found on the website longtom.org:

> "The Long Tom Watershed Council serves to improve water quality and watershed condition in the Long Tom River Basin and surrounding drainages through education and collaboration among all interests, using the collective wisdom and voluntary action of our community members."

Council works toward this mission based on foundations of community involvement, collaborative partnerships, current science and voluntary action. The LTWC has no regulatory power and is not an advocacy organization. Rather, the Council has a successful track record of addressing local land and water topics in an inclusive, positive and cooperative manner. It acts as a forum to bring together foresters, farmers, ranchers, businesses, city planners, scientists and anyone else who is interested and holds a stake in the health of the watershed. One of the strengths of the organization is the belief and

practice that it truly takes a community to keep a watershed healthy both today and, in the future (longtom.org).

Any adult individual who supports the purpose and mission of LTWC and who lives, works and plays in, derives benefit from or is affected by the watershed as its resources may be a member of the Council (LTWC Bylaws- 2018). As a membership/non-profit, the LTWC is rare (Dedrick, 2022).

Long Tom Structure and Governance

The LTWC is governed by a set of by-laws and a Board of Directors, which is entirely citizen-based. Board membership consists of 8-20 members and includes a diverse range of geographic areas, land use, community and cultural interests. Candidates are nominated with a statement of interest and geographical affiliation. Board candidates are voted on and must be supported by at least 70% of members. An executive is comprised of a Chair, Co-Chair, Secretary and Treasurer. Board standing committees, special committees of the Board and non-Board committees are established and dissolved by the Board as required (LTWC Bylaws-2018) (Figure 15).

During our key contact interview, an important distinction was made concerning Board representation and encouraging public involvement. It was shared that often, representation is sought by various organizations and committees with the view that the representative is a spokesperson for a particular company, sector, resident group etc. The LTWC takes the approach that individuals do not represent or serve entire sectors; instead, they provide the *knowledge base to inform the watershed council process*. This tends to alleviate reluctance and pressure from individuals to take on leadership roles. In fact, many planning meetings are organized using watershed maps to determine where individuals in attendance might come together as a community of action.

Over the years, LTWC Board has had over one hundred different people on the Board or sub-committees. This is beneficial in spreading awareness and reputation of LTWC throughout the basin, particularly if there are different perceptions and lack of experience among residents regarding the Council's work (Dedrick, 2022).

In addition, the LTWC has a Technical Team comprised of experts (e.g., wildlife and fisheries biologists, ecologists, fluvial geomorphologists, etc.) from the local university and government resource agencies. Presently, the technical team has approximately ten members, with other ad hoc members brought in as needed. The Team acts in an advisory capacity only to the Board, who retains all decision-making responsibilities (longtom.org).

The LTWC employs twelve staff (9.5 FTE), including an Executive Director, Operations Manager and various positions with a range of backgrounds (e.g., river scientists, fish biologists, stewardship and special project coordination, landscape design and stormwater management, etc.). Although the watershed is relatively small, the LTWC is one of the largest in Oregon.

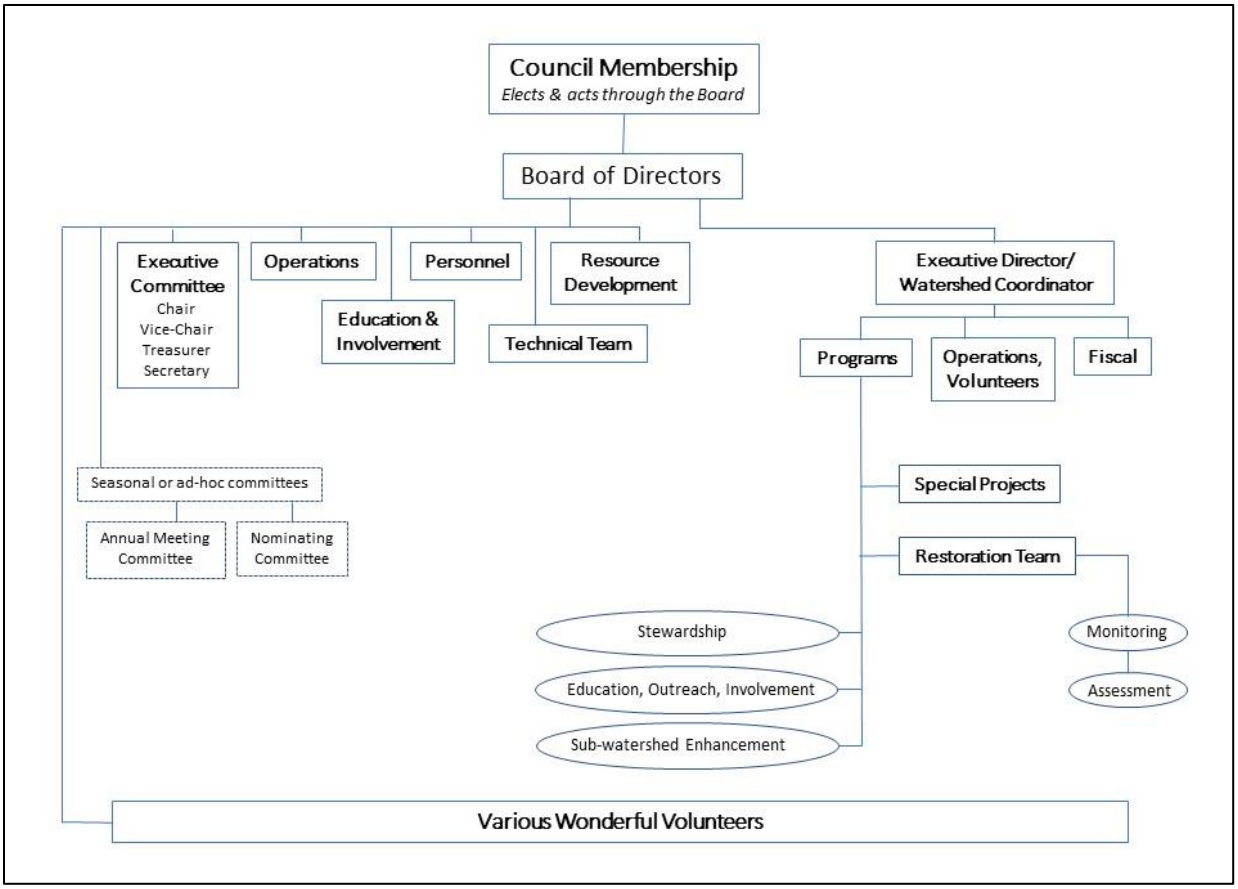

Figure 15. Organizational Structure of Long Tom Watershed Council, (LTWC, 2011).

Planning, Programs and Partnerships

The Plan of Action for the work of the Long Tom Watershed Council is comprised of three main components, with different time scales and levels of detail:

- *A Conservation Strategy* with a twenty-plus-year view and has the most spatial explicit priorities and project types. It only covers ecological priorities,
- *A Strategic Plan* informed by the Conservation Strategy. It includes organizational, outreach and educational goals as well as ecological goals. This plan is revisited and reaffirmed by the Board of Directors each year, and
- *An Annual Leadership and Fiscal Year Work Plan* is a one-year focussed work plan of action, including detailed information, project names, staff responsibilities, approx. costs, etc.

Various studies, technical reports, surveys and monitoring, mapping and other such documents at both the basin-wide and sub-watershed level inform these plans, programs and partnerships.

A community of caring and connection to a larger ecological, cultural, and social community underpins the work of the LTWC. Various public meetings, tours, urban stormwater models and other events highlight the spirit of “neighbours helping neighbours (longtom.org).”

An integral part of the Long Tom watershed community is recognizing Indigenous peoples' historical and ongoing presence in the area. Two bands of Kalapuya (Chelamela and Chemapho), occupied the Willamette River for nearly 10,000 years. In the foothills were permanent villages, while temporary fishing and root-gathering encampments were down on the flatlands near the Long Tom River. Naturally, water was important for both survival and ceremony. The watershed council acknowledges and honours the Kalapuyan's continued connections and ongoing contributions to the stewardship of the basin.

The LTWC is committed to facilitating meaningful dialogue with Indigenous peoples. Over the last 10 years, the Council has established a partnership with native elders to provide internships for native youth to explore and share traditional knowledge on private and public lands in the watershed (longtom.org).

In 2017, the Council raised $26,000 to fund outreach and facilitation for Tribal Engagement. The Spirit Mountain Community Fund of the Confederated Tribes of the Grand Ronde donated a $15,000 grant toward this work. Continuing with an Indigenous Ecological Inquiry program, promoting plant collection for traditional practices, including basket-weaving and informing processes for convening and formalizing relationships between tribal members and interested landowners are a few ongoing initiatives.

These programs are made possible through partnerships with organizations and individuals such as Confederated Tribes of the Grand Ronde, Lane County Parks, Friends of Zumwalt Park, Army Corps of Engineers, Mckenzie River Trust, Spirit Mountain Community Fund, etc.

The LTWC implements three additional program areas. First, the *Urban Waters & Wildlife* Program provides scientific, educational and technical expertise to reduce pollutants entering local rivers and streams and promote wildlife habitat in the city's heart. Work with commercial and industrial partners to address stormwater pollution on a voluntary basis in Eugene, Springfield, and the watershed's smaller towns have been crucial. This upstream approach improves drinking water in the Long Tom and Willamette rivers, benefiting communities downstream in the watershed and beyond.

The second program area is *Water.* The council works to enhance water quality, restore in-stream and riparian habitats, and grow connectivity for native fish throughout a complex of streams and rivers. Projects include fish passage enhancement (such as the removal of barriers such as dams and culverts to restore migration), stream and floodplain restoration through native tree and shrub planting, and hundreds of volunteers monitoring the migration of cut-throat trout and water temperatures (longtom.org).

Last, the *Upland* program focuses on remnant oak prairie and oak savanna habitat left in the Willamette valley. Some of the highest-quality habitat exists in the Long Tom Watershed. Work to restore and enhance these habitats takes place in collaboration with local private and public partners, including prescribed burns, removal of invasives and native tree and shrub planting (longtom.org).

Work by the LTWC depends upon strong partnerships. In addition to partnering with neighbours and landowners, the Council partners with numerous local and regional entities, including municipal governments, state and county agencies, private foundations, and local non-profits. The Long Tom

Watershed is also part of the larger Willamette River system, and its watershed council is a means of interconnection and mutual support (Dedrick, 2022).

A notable partnership includes The Upper Willamette Stewardship Network (UWSN), comprised of the McKenzie River Trust, Middle Fork Willamette Water Council, McKenzie Watershed Council, and Coast Fork Willamette Watershed Council. It is a highly collaborative *"Impact Network"* formed to work together on growing the scale of impact in shared and overlapping geographies. Impact Network is a collaboration framework that pursues large-scale implementation to complex problems (SSIR Five Steps to Building an Effective Impact Network).

Since 2008, the Long Tom Watershed Council has been a partner in the Willamette River Initiative, a substantial commitment has been made from Meyer Memorial Trust to steer the Willamette River and its Tributaries toward a cleaner, healthier future.

The Rivers to Ridges Partnership is a voluntary association of 19 organizations (e.g., land trusts, watershed councils, Nature Conservancy, US Fish & Wildlife, Oregon State Parks, Willamette RiverKeeper), working collaboratively to advance the protection, restoration and effective management of park and open space resources in the southern Willamette Valley. The LTWC has ongoing partnerships and science support with the University of Oregon in Eugene.

Social Infrastructure/Public Engagement

Trust and Cooperation

"It takes a community to restore a watershed (Flitcroft, 2011)." Coordinated restoration projects at the watershed scale are only possible with the cooperation and commitment of all stakeholders. The LTWC has demonstrated long-term, dedicated community participation with results.

Building trust with the Watershed Council is essential. A review of the Mission and Goals of LTWC reveals that only two of eight goal statements deal with ecology (see Box 4 on next page, Appendix E). The remainder focuses on the process or how-to goals in building community capacity (Dedrick, 2022). Actions such as communication, learning, project assistance, information sharing, citizen science and participation.

The building of trust takes time and is an ongoing process. Some landowners have a misperception that the Watershed Council represents the government or some viewpoint of an interest group. The LTWC works to communicate that not only are they not a government organization, they are not promoting any views or policy changes. Instead, their interest is in working with all for the health of the watershed (Dedrick, 2022).

At times, establishing a rapport with landowners, especially in isolated locations, is challenging. People tend to trust their neighbours more than they trust scientists or organizations (Dedrick, 2009; 2022). Hence, building a network of peer leaders within the council and local areas has played a major role in establishing "trust bridges (Dedrick, 2009)." It is a bottom-up and slow process involving site visits, private landowner meetings, local tours with scientists, neighbourhood meetings, etc. Often, peer leaders help individuals understand the science and involve landowners in data collection on their own land or immediate area. This has proven to be one of the most powerful outreach tools for increasing awareness and knowledge. While it takes longer for an outcome, there is a greater commitment from

the local stakeholder. It seems easier and more relevant for landowners to understand the concept of improving conditions on land that is familiar to them rather than on a broader scale (Flitcroft et al., 2009; Flitcroft, 2011).

Box 4 - Long Tom Watershed Council

Mission

The Long Tom Watershed Council serves to improve water quality and watershed condition in the Long Tom River basin through education, coordination, consultation, and cooperation among all interests, using the collective wisdom and voluntary action of our community members.

Purpose

The Council will provide opportunities for people who live, work, play, derive benefits from, or are affected by the Long Tom watershed to cooperate in promoting the health of the watershed and communicating the social and economic benefits to the community.

Vision

A healthy watershed that ensures water quality and riparian and wetland habitat for fish, wildlife, and native plants while recognizing the importance of people's economic livelihood and quality of life.

Social Infrastructure, Community Involvement and Leadership

Ecological problem-solving requires a flexible social infrastructure that can incorporate scientific insights and adapt to changing conditions, particularly at the local level (Flitcroft et al., 2009). The LTWC implements three core methods of building social infrastructure:

- Using science as iterative and integrative, where scientists work alongside landowners and local citizens, combining talents;
- Using data collection to inform science and become a medium for outreach and education at a scale that is designed to answer questions from the local community; and
- Working to enhance sub-watersheds by interpreting and integrating data results in an open question-and-answer forum with local residents (Flitcroft et al., 2009).

Peer leadership within the watershed has emerged from various activities of LTWC, such as science education and watershed data collection. Individuals who are directly involved tend to become leaders in their neighbourhoods, sub-watersheds or areas of influence. As relationships among landowners and the LTWC develop, projects move from isolated locations to multiple landowners engaging in projects within the same sub-watershed. Residents become citizen connectors by sharing their own learning and experiences. As a result, the increasing networks of people and projects support connections within sub-watersheds leading to an ecosystem approach (Flitcroft et al., 2009). The LTWC facilitates this process by applying principles of Impact Networking (Wei-Skillern & Silver, 2013; Ehrlichman, Sawyer & Spence, 2018), such as focusing on impact before organizational growth, partnerships based on trust, promoting others rather than the organization and building infrastructure vs the individual organization. Similar principles and collaboration can be found in the Collective Impact Literature.

The LTWC engages the public through regular newsletters, annual reports, conservation and strategic plans, implementation plans and numerous learning opportunities, public meetings and project tours (at least six per year), Elder Fire talks and various workshops. They have a social media presence through Facebook and Instagram to share good news, items of interest and upcoming events.

The LTWC is not an end-point. It is a process to improve water quality, habitat for fish and wildlife and social-ecological relationships for watershed stewardship (Flitcroft et al., 2009). It demonstrates how important the social dimensions are in integrating science and engaging landowners and neighbourhoods. It takes time to build an effective social infrastructure that includes leadership, vision, trust, resources, partnerships and education in establishing and maintaining integrated water management.

Finances and Financing

Current Arrangements

The Oregon Watershed Enhancement Board (OWEB) is a state agency that provides grants to support place-based groups to restore watershed health and improve local streams, rivers, wetlands and natural areas in Oregon (oregon.gov/oweb). OWEB grants are funded by the Oregon Lottery, federal dollars, and salmon license plate revenue. Watershed Councils must meet grant criteria, and competitive funding is not reserved solely for the councils. For example, other non-profits, such as land trusts, Institute for Applied Ecology, Oregon State University, greenbelt organizations, etc., may also apply for grants from OWEB. Projects that bring stakeholders together and demonstrate collaboration are given preference. While this could place organizations in a position of all vying for limited funds, it also encourages regional networks of local groups to work together on applications/projects (Dedrick, 2022).

The annual budget for the LTWC for 2020-2021 was approximately $1,168,747 (LTWC Annual Report 2020-2021). Funding sources were from four main areas: state grants (49%), private foundations (15%), federal grants (10%) and donations (9%). The remaining funds came from partners, municipalities and fees for services. The Meyer Memorial Trust Fund has committed to the substantial, long-term financial support of the LTWC, while the Bonneville Environment Foundation is supporting a collective impact project, the Willamette River Initiative, including the Long Tom Watershed.

The LTWC has a process to support donations from individuals, businesses and planned giving. Periodically, basin-wide fundraising events/campaigns are conducted, typically aimed at a particular or new initiative (e.g., Indigenous Inquiry program).

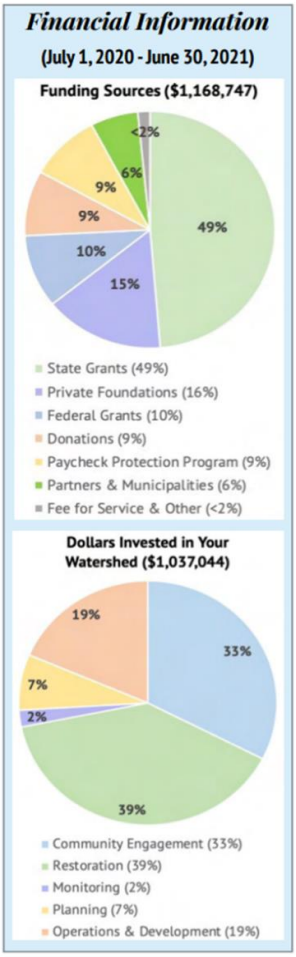

Figure 16. Financial information, Long Tom Watershed Council for 2020-21.

Expenditures for 2020-2021 were approximately $1 million. Perhaps, most notably, 33% of the total expenditures are earmarked for community engagement (33%). This truly

highlights the need for and commitment to community and landowner outreach across the watershed. Restoration (39%) and operations and development (19%) account for the remainder (see Figure 16).

Challenges, Vulnerabilities and Future Financing

Funding for many local organizations is a continual challenge. Much of the Long Tom Watershed is a checkerboard of ownership, including land privately-owned in timber or agriculture, as well as tribal nations. As a result, many of the projects depend on private owners participating in projects and programs. While the City of Eugene and smaller towns and communities continue to grow, there remains a limited local city, town or municipal population to fund the Watershed Council.

One of the notable vulnerabilities in funding is the reliance on State grants, representing nearly half of the entire Council revenue. The amount of funds generated through the lottery tends to fluctuate with economic conditions. Further, Watson et al. (2019) point to disparities in funding, with over 31% granted to watershed councils in the largest and most populated areas of the State. Often, too much competing pressure is placed upon elected leaders and available funds. Complex social and environmental problems continue to emerge, particularly in the face of increased population, urbanization and climate change. State and local leaders are pulled in many directions and as government leadership changes, so do priorities and available funding.

The LTWC continues to seek out sources of funding, such as private foundations, major donors and partnerships with academic institutions in the form of expertise, services and research projects. It is an area for possible growth to ensure independence and self-sufficiency as an organization.

Adaptability: Strengths, Limitations, Challenges

Strengths & Limits of Organization

The LTWC has a long and successful history in watershed management. Enabling legislation for the establishment of watershed councils has been instrumental in funding both the initial creation and, later, ongoing operations. One of the remarkable strengths of the LTWC is the community trust and social infrastructure built over time. It is time-consuming and labour-intensive to meet landowners and neighbours one-on-one and through community tours and meetings, but the results have been positive. Through various mechanisms such as the technical advisory committee, university partnerships, community data collection, staff and agency coordination, decisions are informed through science. The desire for a healthy watershed and fish habitat is a shared vision. The importance of education and community engagement is reflected in the allocation of 33% of the overall budget to these areas.

The creation of a Conservation Strategy, Strategic Plan and Annual Leadership and Fiscal Year Work Plan serve as a review process not only for progress toward goals but institutional capacity. In particular, the work plan details specific actions, staff responsibilities, timelines, etc., which provide for monitoring implementation and accountability. Frequently, it is the 'implementation gap' in planning and implementation which is most often criticized in IWM (Mitchell, 2005).

Apart from the strong social networking, there is still a perception problem regarding the LTWC among various landowners, particularly in more rural and remote areas. The council is viewed as a government organization, and in the U.S., individual and property rights views hold strong (Dedrick, 2022). Some staff have remained for a long period with the watershed council, and strong relationships are often due

to the longstanding presence of key individuals. At the same time, staff turnover creates gaps in those relationships and, at times, may threaten the continuation of a program that was initiated by that person (e.g., Indigenous Inquiry) (Dedrick, 2022). New relationships must be established.

Future Challenges

Climate Change is causing increasingly complex problems, severe conditions and consequences. Currently, Oregon is experiencing droughts similar to British Columbia. Likewise, water quality and quantity affect agriculture, and as water temperatures rise, cold-water fish species are being threatened. Logging continues to reduce forest cover, creating ground instability in ridges and ravines, and setting the stage for mudslides and flooding during extreme weather events (Dedrick, 2022).

As non-regulatory agencies, watershed councils approach IWM through voluntary actions and land purchases. Increasingly governments are seeking to be less involved in delivering services and more interested in steering and incentivizing private, non-governmental organizations and private citizens to take responsibility and action (Watson et al., 2019). As a result, the question of financing arrangements becomes paramount.

The LTWC is vulnerable to funding due to a heavy reliance on grants from OWEB. Changes in politics, values and priorities can bring uncertainty to laws, policies and funding. Currently, Oregon is no longer financing the formation of new watershed councils but rather promoting the joining and sharing of existing councils, thereby reducing the number of grants. To date, LTWC has fought against becoming a regional council. They see the value in being local (Dedrick, 2022).

Much of the Long Tom and the surrounding watersheds are located on unceded lands of First Nations people. Issues of Indigenous rights, access and management of water and other natural resources remain unaddressed. While the LTWC is trying to honour the Kalapuya people through open dialogue, invitations to share teachings and traditional knowledge, and agreements for access to medicinal and ceremonial plants, their full participation in the LTWC remains to be seen.

References Long Tom:

Dedrick, Dana (2022). Semi-structured Interview and Conversation with Dana Dedrick, former Executive Director, Currently Special Projects Lead, LTWC, with S. Cooke and V. Hammond, report authors.

Dingfelder, J. (2017) Wicked Water Problems: Can Network Governance Deliver? Integrated Water Management Case Studies from New Zealand and Oregon, USA. Ph.D. Dissertation. Hatfield School of Government: Public Affairs and Policy, Portland State University.

Ehrlichman, D., Sawyer, D., & Spence, M. (2018) Cutting Through the Complexity: A Roadmap for Effective Collaboration. *Stanford Social Innovation Review, Mar. 15, 2018*

Ehrlichman, D., Sawyer, D., & Wei-Skillern, J. (2015). Five Steps to Building an Effective Impact Network. *Stanford Social Innovation Review, Nov. 11, 2015)*.

Flitcroft, R. (2011) Watershed Councils: It takes a Community to Restore a Watershed. Science Findings 129 (January 2011). USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Flitcroft, R., Dedrick, D., Smith, C, Thieman, C. and Bolte, J. (2009) Social Infrastructure to Integrate Science and Practice: The Experience of the Long Tom Watershed Council. *Ecology and Society, 14 (2): 36*

Parker, K., Margerum, R., Dedrick, D., & Dedrick, J. (2010) Sustaining Watershed Collaboratives: The Issue of Coordinator-Board Relationships. *Society and Natural Resources 23:469-484.*

Long Tom Watershed Council. (2021a) Annual Report, 2021. Eugene, OR.

Long Tom Watershed Council (2021b) Planned Work for Fiscal Year 2022. Eugene, OR.

Long Tom Watershed Council (2018) Bylaws. Long Tom

Mitchell, B. (2005). Integrated water resource management, institutional arrangements and land-use planning." *Environment and Planning 37: 1335-1352.*

Thieman, C., 2000. Long Tom Watershed Assessment. LTWC.

Watson, N., Shrubsole, D., & Mitchell, B. (2019) Governance Arrangements for Integrated Water Resources Management in Ontario, Canada, and Oregon, USA: Evolution and Lessons. *Water* (11): 663

Wei-Skillern, J. & Silver, N. (2013) Four Network Principles for Collaboration Success. The Foundation Review 5(1):121-129.

Online:

www.longtom.org/

www.oregonwatersheds.org/

Case Studies – Results

The case studies presented in this report offer various types of bottom-up, community-led frameworks as follows:

- Joint Municipal Services Board (2): Severn and Okanagan (one called an association, the other a board)
- Roundtable – Coquitlam
- Council – Long Tom
- Co-governance Board – Cowichan (Plus an associated non-profit set-up)
- ENGO (Project) – Elizabeth River – currently working toward establishing a roundtable for better management and sustainable funding. (Plus, a sister organization/trust set-up)

As community-led organizations, each act in an advisory capacity only (to planning districts, government agencies and departments, resource users and the public), rather than exercising any regulatory or decision-making power embedded through legislation. In this sense, all the groups are performing a similar function. Hence, the model, structure or name of the community group or framework appears less important than the role and actions carried out by the group.

In fact, the case study organizations considered are as varied as the watersheds themselves. As the IWM literature and practitioners share (Mitchell, 2005; Shrubsole et al., 2018; Waston et al., 2019), there is no prescriptive approach to be taken. Instead, the consideration of context, capacity and the framing of local problems and solutions are the essential elements in addressing the greatest concerns while providing for local engagement and ownership of a meaningful and effective process.

Each organization reviewed here gets to the point that is right for them and their community. How they get there is multi-faceted and where differences occur. The results that follow consider common themes across organizations and some different and specific experiences or lessons to be shared. Elements of IWM are highlighted throughout. These points are intended to be considerations only as Muskoka contemplates what IWM might look like for them.

Table 5 provides a cross-comparison of the case studies showing some of the key characteristics considered, along with Muskoka listed as a reference point. Elements that emerged follow.

Table 5. Cross comparison of case study watershed organizations.

	CRWR	CWB	OBWB	SSEA	ERP	LTWC	MWC
Governance							
Enabling Legislation – (W) Water (MOU) Memorandum		X				W	
Enabling Legislation – Planning or Municipal Instrument			X	X			
Government-led	X						
Community-led	X	X	X	X	X	X	X
Status - (NP) Non-profit (C) Charity (NP/AC) Associated Charity	NP	NP/AC			NP/AC	NP	NP
Partnerships with government agencies (MOU) Memorandum	X	MOU	X	X	X	X	X
Board Members (a) appointed (e) elected	e	e	e	e	e	e	e
Staff: # = FTE	1.5	.5-1.0	7	7	24	9.5	0
Science-based experts/reports advise	X	X	X	X	X	X	X
Plans: (W) Watershed (I) Implementation (B) Business	W/I/B	W/I/B	W/I/B	W/I/B	W/I/B	W/I/B	W
Social Infrastructure/Public							
Membership (in addition to Board, open)	X				X	X	
Partnerships - NGOs	X	X	X	X	X	X	
Partnerships - Businesses		X	X	X	X	X	
Partnerships - Landowners			X	X	X	X	
Partnerships - Academic	X	X	X	X	X	X	
Citizen volunteers	X	X	X		X	X	X
Indigenous: (E) Engagement (G2G) Co-Governance (I) Invited	I	G2G	X	?	?	I	
Funding							
Government - Federal - grant	X	X			X	X	
Government - Provincial/State - grant	X	X	X	X	X	X	
Government - Municipal (V) Voluntary (L) Levy	V	V	L	L	V	V	
Foundations, Trusts			?	X	X	X	
NGOs				X	X	X	
Private Donations				X	X	X	

CRWR – Coquitlam River Watershed Roundtable
CWB – Cowichan Watershed Board
ERP – Elizabeth River Project
LTWC – Long Tom Watershed Council
OBWB – Okanagan Basin Water Board
SSEA – Severn Sound Environment Association
MWC – Muskoka Watershed Council
X – present in case study

Governance

Enabling Legislation & Governance:

Although not a requirement by any means, especially for a community-led initiative, four of the cases reviewed had some form of enabling legislation; two at the provincial/state level and two at the municipal level. In part, this distinction allows organizations to have some standing or recognition among the community, organizations and planning agencies. In some cases, such as the Long Tom, it allows access to numerous grant programs stemming from the state level. This reflects the influence of governance context in having those upper-level programs in place.

In two cases, the Coquitlam and Cowichan, municipal support was voluntary. One of the drawbacks in these cases is the uncertainty of funding from year-to-year (Coquitlam has a 3-year funding term, up for renewal this year) and the amount of funding provided. In the case of the Cowichan, the amount provided by the municipality has remained unchanged for over ten years. No increase is proposed until 2024, when a further $10,000 from the municipality and $5,000 from the Cowichan Bands are budgeted (Cowichan, 2020).

The Severn and Okanagan are able to source funds through municipal levies. This tends to secure a predictable amount, but in rural areas, the assessed value for taxation may be low. This is illustrated through the distinct differences in watershed population, development and affluence between the Severn and Okanagan. Here, Muskoka resembles the Okanagan, with a retirement and leisure population creating great affluence in the assessed property values in some regions of the watershed. For the Okanagan, this is integral to their funding. Warwick Sears (2022) was clear that assessment in the Okanagan is relative to all the properties and locations involved across the watershed. Likewise, any programs or projects carried out are designed to benefit all residents in the watershed (i.e., equitably).

Often, municipal counsellors are under competing demands and pressure to limit tax increases. It is worth full consideration of the costs and benefits (e.g., who benefits and who pays) of having a healthy watershed. At times, being a municipal service or quasi-government partner precludes organizations from accessing certain grant criteria, such as employment programs (Cayley, 2022; Warwick Sears, 2022). Although, if funds are secured through the municipality, organizations may partner in projects in order to share monies.

As part of, or in close partnership with municipalities, organizations can suffer from the public perception that they are one more form of government and that is not always viewed in a positive manner. Through interviews, including Muskoka, practitioners shared that landowner views about individual and property rights are often an issue to be addressed. It becomes necessary for organizations to establish their mandate, role and reputation in the community. Further, this takes time and considerable effort in building relationships and proving a track record of actions.

Organizational governance relationships are formalized for the Okanagan and Severn through the respective municipalities and Cowichan, with the Cowichan Tribes and the Cowichan Valley Regional District. These agreements are revisited and reviewed periodically. To a certain extent, the Long Tom has a relationship and funding structure embedded in State legislation. The remaining cases have a loose partnership structure. The Coquitlam is currently renewing its financing agreement with the municipalities, and many Board positions are up for renewal or reappointment (Birch, 2022).

In 2018, the ERP put forth a grant proposal to the National Fish and Wildlife Foundation for a multi-year project (to 2021/2022) to include the usual 6-year update for the State of the River Report, but even more so to establish a formal leadership roundtable that would address the need for long-term, regional leadership and financing. The University of Maryland's Environmental Finance Center and the University of Virginia's Institute for Environmental Negotiation to facilitate the process (ERP, 2018).

All case studies had governance documents such as terms of reference, mission statements, goals, mandates and by-laws governing the operation and responsibilities of the organization. There was a common element or vision, regardless of stakeholder interests, that everyone agreed upon. This was particularly important for the Elizabeth and the Coquitlam as "working rivers" with numerous, and at times, competing uses. The ability to find common ground was imperative. Further, organizations acted in advisory capacities vs advocacy or regulatory authority. It is both a shortcoming in the ability to ensure implementation and strength in that it keeps relationships with all in good standing (Warwick Sears, 2022; Dedrick, 2022; Birch, 2022).

Organization Status:

Except for the Okanagan and Severn as municipal bodies, all case studies had either non-profit and/or charitable status. In some cases, such as the Elizabeth River, private foundations and donations provide substantial support. In other case studies, donations played a role, but not a defining one, where the absence of funding would undermine the organization.

Early on, the Cowichan Water Board established a Cowichan Watershed Society to streamline financial management, expand fundraising and obtain charitable status. The Coquitlam is considering the findings of a research paper conducted on their behalf examining sustainable funding options. The Elizabeth River created a sister organization, the Living River Trust, when they realized the challenges were larger than their mandate and capacity could address. Initially, the trust was a water trust only to clean up bottom sediment and to protect aquatic habitat. In the last few years, it has evolved into a land and water trust, using tools such as easements for shoreline access and protection and land acquisition to obtain even small parcels as green space in a suburban area. In 2021, the Coquitlam River Watershed Board received society status (non-profit) in BC.

Human Capacity/Staff

Staff:

Even for organizations with a modest budget (Coquitlam, Cowichan), the presence of a Coordinator is essential in keeping the process moving through a coordinated effort. Roles may involve speaking with stakeholders, arranging regular meetings, maintaining documentation, managing a social media campaign and overall coordination to keep the organization relevant.

Staffing is a challenge for organizations. Securing funding is constantly ongoing. Not only to fund salaries but to keep an adequate capacity to implement programs and activities of the organization. In the case of Long Tom and Okanagan, the ability to keep staff on a long-term basis is considered a strength for consistency in relationships with landowners and the public, as well as providing an "institutional memory" and overall momentum (Dedrick, 2022; Warwick Sears, 2022).

Larger organizations were able to offer more staff resources overall, in addition to providing attractive salaries, benefits, working conditions and flexible arrangements. As a result, key staff positions were occupied by individuals who had been with the organization for 10 – 20 years in some cases.

Science-Information & Planning

In all case studies, the use of science in understanding problems and informing potential actions was utilized. Many scientific studies, reports and plans were completed through collaborative relationships with academic or government researchers. For the Cowichan, this scientific expertise is most often through the various levels of government and responsibilities in the watershed, as well as the consideration of traditional knowledge through a government-to-government agreement between the province and the Cowichan Bands. Similarly, the Elizabeth River has multi-jurisdictional agencies involved in the water resources and hence, the capacity for a great deal of expert advice. At the same time, the ERP has a staff typically of about 26 FTE, with backgrounds in science, ecology, landscape architecture and education. The Okanagan, Severn and Long Tom all have staff with different backgrounds and expertise, but the ability to carry staff is limited to an average of about seven people (FTE). Partnerships with academic institutions complement the ability to conduct research and monitoring in the watershed and receive expert guidance. This was particularly prevalent for the Okanagan, Long Tom and Elizabeth River and recognized as important to gain valuable scientific knowledge in the other case studies.

All case studies had a Watershed Plan, along with supporting plans for implementation and specific plans such as a business plan to detail actions, personnel, funding, timelines etc. This is essential in measuring progress and adjusting goals from year to year. In particular, the LTWC plan was quite detailed, offering months and dates (vs quarter or year), and covering additional areas such as agency capacity and growth (e.g., funding sectors and targets). The Cowichan had ongoing monitoring and live updating of their progress and goals throughout the year, with revisions reflected in next year's planning. The use of targets, defined roles, resources and timelines was critical. The active role of science was viewed as an important element in the legitimacy of the organization.

Internal Partnerships & Leadership:

Naturally, government partnerships were predominant in all cases and at all levels, as responsibilities and jurisdictions for land and water resources overlap. In addition, these partnerships provided funding grants, staff resources, areas of expertise and collaboration to integrate planning, policies and local actions. In many cases, the government partnerships were able to share in-kind support to organizations such as staff time, office space, administrative expenses, etc. Yet the continuation of all the organizations illustrated a community-led process, with a few noting that securing provincial leadership or presence at the meeting table was fleeting and sometimes absent due to budget and staff constraints. Interestingly, Koontz & Newig (2014) point to collaborative implementation often coming from collaborative groups rather than traditional or inter-organizational forms of government.

Often, a "champion" of the cause is instrumental in successfully carrying the organization forward. In the case of the Elizabeth River, a single citizen decided to take action, undaunted by the scope or layers of complexity, and rally support around the need and love for the river (elizabethriver.org). In Coquitlam, an individual city staff member's unwavering commitment to getting people at the table was instrumental. Following this, the unlikely coming together and determination of two individuals from

completely different sectors to sit down and write out some draft statements that everyone could agree on saw the establishment of the CRWR after struggling for nearly four years (Birch, 2022; coquitlamriverwatershed.ca). The critical role of a community leader and social infrastructure cannot be underestimated.

Social Infrastructure:

External Partnerships

NGO partnerships were present in all case studies. In some instances, it was on a smaller scale or one-time events, such as river clean-ups, stormwater gardens, educational events and awareness campaigns (e.g., Coquitlam, Cowichan). The LTWC is part of a ten-year partnership with their parent and the larger watershed, the Willamette, and several ENGOs with funding provided through a foundation. Similarly, the ERP has a significant partnership with major foundations and extends its work to include environmental justice to serve those more affected by environmental pollution concerns and with less access to natural areas.

Partnerships with businesses played an important role as well. Their participation varied from collaborating on remediation projects (Elizabeth R), to funding programs (e.g., ERP, Power Supply Company, Cowichan – pulp and paper mill), to funding from a distance for various campaigns as part of their public image as corporate citizens with interest in the resource. Less frequent was participation by the business sector in the organization's actual governance, such as sitting on Boards, subcommittees, etc., unless related to the resource industry. Businesses were present in the case of the Elizabeth River as an urban/suburban watershed and harbour moving goods and services.

Academic Institutions

Academic partnerships featured prominently in Okanagan, Elizabeth River, Long Tom and, to a lesser extent, Severn. Support was present in a range of projects and capacities such as scientific research, data collection and monitoring, policy review and development, etc. The ERP and LTWC both have key partners with local universities looking at the implementation of collective impact and impact networking to increase their work's scope, pace and effectiveness. In other cases, Coquitlam, Cowichan and Okanagan had extensive reviews and research papers on watershed governance, policy and future sustainable funding models. Academic partnerships play a significant role for many organizations. Often, research/project funding is already in place.

Community members

The role of landowners and citizens was essential in the Long Tom, Okanagan and Severn. In particular, all three organizations have active citizen-science programs for collecting and monitoring data. The Okanagan, Elizabeth River and Long Tom work directly with individual landowners for scientific study, data collection, remediation, restoration and education on various properties on an ongoing basis. Tours of landowner sites and projects are used to educate a broader audience.

The value of direct and positive experiences with watershed citizens was viewed as an imperative in communicating organization mandate and neutrality in serving the health of the watershed. The Long Tom utilizes an impact network model to build communities and connections across the watershed, working toward an ecosystem approach for both the environment, but also social networking and

capacity-building. According to organization directors and staff, participating on-site with individual property owners and the goodwill and word of neighbours carried the reputation of the organization further than anything else (Dedrick, 2022; Gavin, 2022; Warwick Sears, 2022). This was especially important in rural areas of the Long Tom and in the reaches of the Okanagan (e.g., upstream, farming and winery communities).

The Elizabeth River Project's use of the collective impact framework has been recognized a national model in the US for its success in environmental negotiation and the ability to bring numerous and disparate stakeholders together.

Indigenous Participation

The CWB was the only organization with full participation and decision-making powers of Indigenous peoples in the planning and management of the watershed, as provided for in a formal government-to-government agreement (Cowichan and the Cowichan Valley Regional District via the province of BC). This agreement was the first of its kind in BC when the CWB was established. The integration of traditional knowledge is in some cases, being used to develop watershed plans by the Cowichan Bands themselves (e.g., Koksilah watershed plan – adjoining watershed to the south of the Cowichan). In the Okanagan, First Nation tribes sit as governing partners on the OBWB – Board of Directors. Until recently, only the member municipalities could vote on financial matters. This has now extended to include First Nations representatives as a "governing body."

In the Long Tom, an Indigenous knowledge program has been actively instructing youth on practices, traditions and ceremonies while offering educational opportunities to the public. Further, the Long Tom has been working with various bands and individual landowners to allow for access to resources on private property (e.g., plants and reeds used in ceremonies, weaving, etc.). While invited, there is a reluctance for First Nation participation in the actual governance of the watershed as relationships are fraught with unresolved issues of unceded territory and Indigenous rights.

In Coquitlam, First Nations have engaged in the roundtable from the outset and hold places on the core Board. At times, these conversations and relations are difficult and tensions high. Here again, with unresolved treaties and Indigenous rights in question, it tends to challenge the legitimate role afforded to First Nations.

While the presence and prevalence of resource conflicts and Indigenous peoples may be highlighted in BC, there is a growing awareness and need for First Nations to be meaningfully engaged in watershed planning processes elsewhere, including Ontario. It may lie, however, in the view of First Nations, what serves as meaningful, valued input and decision making rather than their sense that a box is checked off in some form of public consultation. This may be an area for both Severn and Muskoka to examine.

Funding

Government

At the federal level, four organizations received government funding. Typically, this was due to federal jurisdictions (e.g., fisheries, First Nations). At the provincial/state level, all organizations received funding from various departments and agencies ranging from natural resources to water to municipal services, etc. However, in both cases, federal and provincial/state funds were structured in the form of

competitive grants that organizations needed to apply for and be successful rather than an automatic funding formula.

All watershed organizations received funding at the municipal level. In part, this is not surprising as it reflects local conditions and needs. However, only Severn and Okanagan have formal agreements and an established ability to utilize a levy system. This tends to secure funding on a longer-term and somewhat guaranteed amount, although formulas are typically capped at a maximum, and assessed values and hence, budgets are very different from one watershed to another (i.e., Severn, Okanagan).

In the remaining case studies, municipal support was through a loose agreement to provide a set amount, sometimes on a 3-year term or a year-to-year basis. Presumably, municipalities would continue to fund the work required and carried out by the watershed organization. Yet, there is no guarantee for long-term funding support, which creates uncertainty and limits the ability to conduct long-range planning. Further, in the case of Cowichan, the municipal amount has been static for over ten years. Municipalities provided additional in-kind support for all organizations in varying forms of staff time, office space, administrative costs, etc. Most organizations reflected this in their financial reports. In the cases of Coquitlam and Cowichan, where their overall budget is very low, these in-kind donations represent a substantial piece in their budget and ability to operate at all.

Foundations, Trusts, Individuals - Future

Both the Elizabeth River and Long Tom utilized charitable foundation partnerships in multi-year initiatives. The ERP has a more formalized system of foundation supporters it relies on, along with an urban population from which to draw. The Long Tom has Foundation support through a local memorial fund that typically supports projects that demonstrate numerous partners working together.

All the case study organizations identified private donations as an area currently underutilized and their desire to build on this for two reasons: 1) the untapped capacity for funds; and 2) to build greater independence from government funding/grant programs which can be both variable and short-lived. In the face of competitive grants, various organizations have come together to partner in projects and apply for funding. Similarly, there is potential for organizations with complementary or overlapping mandates to coalesce as one funding entity, although it requires a clear procedure for the administration of funds to various groups or committees within groups.

The Elizabeth, Coquitlam and Long Tom all have memberships available to the public. Coquitlam and Long Tom appear to be at no cost but rather an interest in the watershed. Annual meetings and social events provide updates, education and relevance for the organizations. The Elizabeth has a tiered system of membership and fees, starting at $35 and going into much higher philanthropic categories with associated benefits/recognition. Notably, the Elizabeth River was the only organization to hire a professional fundraising consultant.

All organizations cited long-term sustainable funding as one of their challenges. The Coquitlam and Okanagan have been actively considering a range of alternative options, outlined in two research papers found in the references section: a) Sustainable Funding Options: Recommendations for the Coquitlam River Watershed Roundtable (2018), which examines a range of opportunities through various resource extractions fees, utility (BC Hydro) fees, taxes, etc.; and b) Local Conservation Funds in British Columbia: A Guide for local governments and Community Organizations (2017), acts as a guide for municipalities in

setting up conservation funds with examples in Columbia Valley, Kootenay Lake, South Okanagan Conservation Fund and the Parkland Acquisition Fund in the Capital Region (Vancouver).

In BC, the Watershed Security Coalition and BC Freshwater Legacy are working to develop a watershed security fund to protect watersheds and advance the work of watershed boards and First Nations. The goal is to establish an endowment fund co-developed with First Nations and communities that would be independent of government reliance on funding. Framing watershed security as important to people, the economy and the environment is necessary to build public understanding and support (Tull, 2022b).

Results References:

Birch, M. (2022). Semi-structured Interview & Conversation with Margaret Birch, Co-founder of CRRT, Support & Liaison – CRRT, and former Coquitlam employee, with S. Cooke and V. Hammond, report authors.

Cayley, J. (2022). Semi-structured Interview and Conversation with Julie Cayley, Executive Director, Severn Sound Environmental Association, with S. Cooke and V. Hammond, report authors.

Coquitlam River Watershed Roundtable. (2018). Sustainable Funding Options: Recommendations for the Coquitlam River Watershed Roundtable.

Cowichan Watershed Board. (2020). Annual Report – 2020.

Dedrick, Dana. (2022). Semi-structured Interview and Conversation with Dana Dedrick, former Executive Director, Currently Special Projects Lead, LTWC, with S. Cooke and V. Hammond, report authors.

Elizabeth River Project. (undated, 2018?, as goals start 2019?). Sustaining a National Model for Collective Impact on the Elizabeth River. Full proposal to National Fish and Wildlife Foundation re: Innovative Nutrient and Sediment Reduction – Regional Scale Implementation.

Gavin, B. (2022). Semi-structured Interview and Conversation with Barbara Gavin, River Star Homes Program Manager, Elizabeth River Project, with S. Cooke and V. Hammond, report authors.

Koontz, T. M., & Newig, J. (2014). From Planning to Implementation: Top-Down and Bottom-Up Approaches for Collaborative Watershed Management. *The Policy Studies Journal, 42(3): 416-442.*

Mitchell, B. (2005). Integrated water resource management, institutional arrangements and land-use planning." *Environment and Planning 37: 1335-1352.*

Shrubsole, D., Walters, D., Veale, B, & Mitchell, B.(eds.) (2018). *Integrated Water Management in Canada: The experience of watershed agencies.* Routledge, New York.

Smith, J. (2008). A Critical Appreciation of the "Bottom-Up" Approach to Sustainable Water Management: Embracing Complexity Rather Than Desirability. *Local Environment, The International Journal of Justice and Sustainability, 13 (4).*

South Okanagan-Similkameen Conservation Program. (2017) Local Conservation Funds in British Columbia: A Guide for Local Governments and Community Organizations. (2nd ed.) Penticton, BC.

Tull, C. (2022b). Conversation with Coree Tull, Director, Government Relations and Engagement, BC Freshwater Legacy with S. Cooke and V. Hammond, report authors.

Warwick Sears, A. (2022). Semi-structured Interview and Conversation with Anna Warwick Sears, Executive Director, OBWB, with S. Cooke and V. Hammond, report authors.

Watson, N., Shrubsole, D., Mitchell, B. (2019) Governance Arrangements for Integrated Water Resources Management in Ontario, Canada, and Oregon, USA: Evolution and Lessons. *Water* (11): 663

Discussion

The desire to undertake Integrated Watershed Management (IWM) in the Muskoka River watershed (MRW) is a testament to the high value placed on the region's natural resources. Many acknowledge that the natural resources underpin the local economy and the well-being of permanent and seasonal residents. It is also recognized that, although not as intense as in southern Ontario, development, particularly shoreline development and growing urban areas, represents current and future threats if land use planning is not coordinated in a way that considers the linkages between land and water. Climate change and the health of the native forests are also a concern. Consequently, Witzel et al. (2020) recommended that IWM be undertaken in the MRW to ensure a science-based and ecological perspective on environmental and land use management.

Integrated watershed management is a continuous and adaptive planning and implementation process promoting coordinated management of natural resources and inclusive decision making that considers environmental, social and economic decisions and activities within the defined scale of a watershed (Global Water Partnership, 2000; CCME, 2016). It is a process that incorporates the best available science, and willing and engaged stakeholders and is iterative in a way that enables learning. Achieving IWM is a noble and aspirational goal. The complexity of the issues combined with siloed institutional or administrative management approaches confounds the process of watershed management (Veale, 2010) and, therefore, requires persistence, collaboration, leadership and commitment.

Compelling cause. Watershed management organizations usually form because of a crisis, conflict or compelling cause for change. The watershed organizations reviewed in this study generally formed following draught, conflict between resource use and habitat to support a valued resource (e.g., salmon), poor water quality and pollution of a valued aspect of their environment. Although not common, protecting a valued natural landscape before it is severely impacted is less common although Hardy and Koontz (2010) highlighted the Grand River Partnership in Ohio as a watershed organization committed to the preservation of the mostly rural watershed draining to Lake Erie. Even Ontario's Conservation Authorities were established because of concern regarding droughts, floods, deforestation and soil loss (Conservation Ontario, n.d.). Only a compelling cause will hold diverse stakeholders together through the challenges that are inherent in any collaboration (Thompson, 2016). Watershed organizations generally form because of a compelling cause and the need for more coordination and collective action that extends beyond jurisdictional lines and boundaries.

Governance & decision making. Coming together to create a process for shared decision making is collaborative governance. Establishing a shared decision making process for natural resources within the topographical boundaries that delineate a watershed is collaborative watershed governance and includes a range of mechanisms that are created to establish a process through which participants can see themselves participating in. Mechanisms can include overarching legislation (e.g., Municipal Act, Conservation Authorities Act) that are formally established or approaches that guide internal processes such as operating procedures, guiding principles, vision and mission statements.

Incorporating principles that embody IWM early in the adaptive process can help guide collaboration for shared learning and decision making in the Muskoka River watershed. The use of guiding principles for IWM or IWRM can help to facilitate more holistic or integrated outcomes and dates to the International Conference on Water and the Environment in Dublin in 1992 (ICWE 1992). Generally, the watershed

organizations embraced elements of integrated watershed management as guiding principles. Some IWM principles from ICWE (1992) include:

- Managing natural resources and water using a watershed as the spatial scale,
- Considering all aspects of water through the water cycle,
- Watershed management is a participatory process, incorporating an inter-sectoral approach, representation of all stakeholders, and
- Considers the sustainability of the collective resources for future generations.

Additionally, Conservation Authorities in Ontario established guiding principles that support the notion of integrated watershed management, as highlighted by Mitchell et al. (2014):

- Forming a partnership of municipalities**,**
- Using a watershed as the land unit for management,
- Work is grounded in local initiative,
- A healthy environment for a healthy economy,
- A comprehensive or 'ecosystem' approach, and
- Cooperation and coordination

Although SSEA is not a formal Conservation Authority enabled by the Conservation Authorities Act, they adopted similar principles that have guided Conservation Authorities since their formation. One principle of Conservation Authorities is that they are a partnership of municipalities undertaking actions for the benefit of all, and this guiding principle has facilitated collaboration across the municipalities for SSEA. Both SSEA and OBWB undertake activities that benefit all based on the premise/principle of their organizations deliberately working across municipal boundaries.

The watershed organizations reviewed in this study all had stated visions of their watershed into the future and a mission that highlighted how their organization contributed to that vision. The vision was a mechanism to align participants and efforts toward a common outcome. The process of establishing shared vision for the Muskoka River watershed would begin to develop common ground for disparate actors to come together and align effort. Setting a shared vision takes time, patience and perseverance but a critical process to bring key stakeholders together.

The watershed organizations reviewed in this study revealed a great deal of similarities in organizational structure. Although, as Municipal Services Boards, both the Okanagan and Severn are unique in their ability to apply a levy to ensure stable funding. Otherwise, the organizations each had a watershed coordinator or director, and executive, operation committees as well as special project or advisory committees (See Figure 17). All act in an advisory capacity with no regulatory authority. However, through establishing trust and reputation, they have become a recognized entity in planning and management decision making.

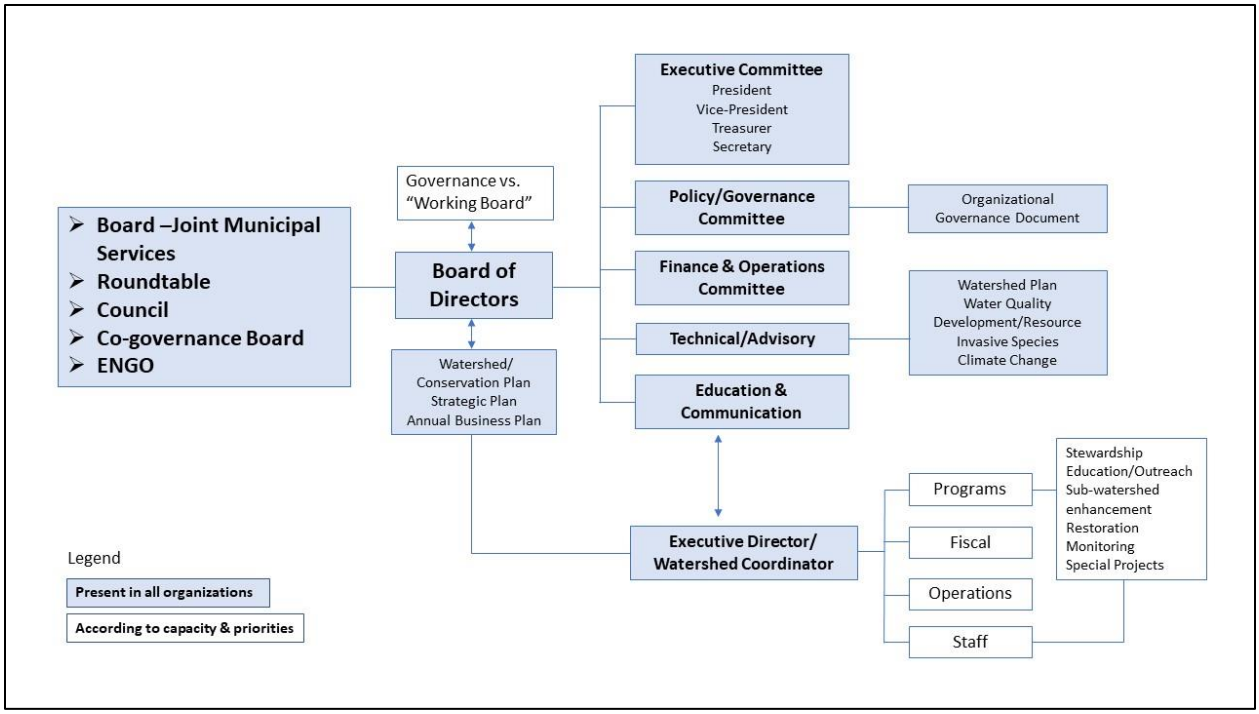

Figure 17. Generalized organizational governance structure of a community-led organization

Science-informed decision making can be enabled through developing a watershed plan. A watershed plan is an example of a 'common agenda' that is compiled through the collaborative development of the plan**.** It can be the road map for watershed organizations to coalesce stakeholders and drive action. Watershed plans can also help build a shared understanding of how the watershed works and the challenges or issues, but it takes time. As mentioned earlier, all case studies we investigated had a watershed plan. For example, all participants in the Elizabeth River Project agreed on the 18-point watershed restoration plan, but each plays a different role based on its capabilities. One group of organizations works on creating grassroots support and engagement among citizens. A second provides peer review and recruitment for industrial participants who voluntarily reduce pollution, and a third coordinates and reviews scientific research (Kania and Kramer, 2011).

Although there is no comprehensive watershed plan for the Muskoka River, a few existing resources contribute to the watershed's characterization and represent a starting point. For instance, the Muskoka River Water Management Plan (2006), the Report "The evolution of Water Management in the Muskoka River watershed (Cragg, 2020) and numerous Watershed Report Cards all combine to provide insight into the current state of the watershed and how it functions. In addition, the DMM's recent portfolio of projects will also build on this foundation, such as the natural heritage inventory, the hydrologic model, floodplain mapping, and the acquisition of LiDAR for digital elevation mapping. Other considerations could include the geology, soils and physiography. Through the foundational information in these reports, together with the predominant issues in the watershed such as flooding, erosion, siltation, water quality, biodiversity and natural habitat loss from development and a changing climate, actions can be identified through a collaborative process to help mitigate impacts.

Collaboratively building a conceptual understanding (or 'model') is one approach to help develop a shared understanding and helps frame the science and technical information to decision-makers. Since

many of the elements of a watershed plan are usually undertaken in a 'nonlinear' approach, a conceptual model can be started, and future research and study can incorporate new knowledge and information once it is acquired. Building a common understanding of how the watershed works allows collaborators to begin to know what actions they can take to improve the watershed's health.

Funding. The importance of sustainable long-term funding cannot be understated. All case studies struggle with securing core funding except for the Okanagan Basin Water Board and the Severn Sound Environmental Association. These watershed collaboratives received funding through an apportionment approach based on local property taxes. Although the core funding wasn't necessarily enough to cover all service costs in both organizations, it provided the basis for leveraging additional grant funding. Limited funding has motivated these organizations, and others, to partner and collaborate more broadly. In contrast, those organizations that do not have sustainable funding are at risk of disbanding. If there is a desire to include municipalities that are part of the Muskoka River watershed yet fall outside of the DMM, then a collaboration agreement with possible funding considerations is likely necessary.

One strategy for securing funding was establishing a *sister* charitable organization. For example, the Cowichan Water Board established Watershed Society to provide financial and administrative support for their work. Similarly, the Elizabeth River Project established the Living River Trust to fund and carry out work beyond the capacity of the core organization. Coquitlam recently received 'society' or non-profit status. There are many conservation and/or charitable organizations in Muskoka (e.g., Land Trusts, Friends of the MRW) whose visions and missions might closely align with the MWC. Exploring and identifying strategic alliances with other Not-for-Profits and Charitable Organizations may facilitate and streamline many efforts, including fundraising, while reducing the confusion about the many players in the environment/watershed space.

Collaborative process. An implementation framework for collaborative IWM requires developing continuous and adaptive processes that incorporate existing institutional arrangements (Dietz et al. 2003). IWM can be messy, with many activities occurring simultaneously and rarely do these activities occur in a linear fashion (Heathcote (2009) as cited by Veale, 2010). Establishing collaborative and adaptive processes can enable the consideration, integration or alignment of the various elements (environmental, social, economic) that are important to, or are highly valued by, local stakeholders. Pratt Miles (2013) highlights five principles to use when designing collaborative adaptive management processes:

1. Provide forums for interaction between managers, scientists and other stakeholders
2. Invite and document input from affected stakeholders at key junctures in the adaptive management process
3. Share data and information with all stakeholders
4. Identify in advance triggers or points in the process when monitoring results and new information will be evaluated to enable changes in management if warranted
5. Design decision making structures to incorporate and act on new information

Partnerships and collaboration are becoming much more common, and the responsibilities of local agencies are increasing (de Loë and Kreutzwiser, 2006).

Creating and supporting a process for collaboration will be essential to advance IWM in the Muskoka River watershed since there is no 'super agency,' as referenced by Butterworth et al. (2010), that makes

all the decisions for managing water or natural resources. Further, no local 'experts' oversee all management of natural resources in an integrated way. Instead, a spectrum of decision-makers, including policy experts, regulators, land use planners, foresters, and local subject matter experts, must collaborate to align efforts toward achieving the vision for the watershed. For community-led collaboratives, undertaking deliberate actions to engage key decision-makers that help to build relationships and trust is critical 'currency' in collaborative processes.

Collaborative approaches, where people and organizations come together to jointly define and solve problems, are becoming more common (Melnychuk et al., 2012). While there is growing acceptance of bottom-up approaches incorporating local context, people, knowledge and skills, this is not without its limitations. Smith (2008) points to four critiques:

1. Token representation rather than meaningful participation and decision making;
2. A presumption that communities are cohesive entities vs various interests, values, competing uses, etc.;
3. A lack of resources (e.g., human, financial, expertise); and
4. A lack of knowledge about the process and how best to facilitate it.

Smith (2008) further points out that for the bottom-up approach to mature as a theory and practice and evolve into the most efficient, empowering and sustainable approach to environmental management, practitioners and academics alike must appreciate and address its complexity rather than simply embrace its desirability. Koontz and Newig (2014) suggest that the key factors in community-led collaborations include trust, resources, communication and networking. Their research indicates that network interactions are a greater influence than the organization's or program's design.

Build the collaborative process with the people at the table. It is important to build a process around the interested and engaged people who are already at the table but leave room for new people to join in later. The community-led watershed organizations reviewed in this study built inclusive, collaborative processes that included local governments, sectors and watershed residents. Most of the case studies engaged government (provincial/state/federal) staff to varying degrees of success. Participants routinely highlighted the lack of capacity and/or knowledge as a barrier to collaborating with government staff. As such, government actors' participation ranges from fully engaged to missing in action. All community-led organizations profiled here worked hard to maintain open lines of communication with key government actors.

Case study results illustrate how each organization had a collaboration process that worked for their local context and suite of actors and decision makers. They all had the ability to bring everyone around the same table to discuss the collaborative watershed issues and the actions needed to achieve their visions. This is important for building a common understanding among participants. In some instances, however, this process was drawn out. For example, it took almost four years for disparate interests to establish the group's vision and mission that everyone could agree on for the Coquitlam watershed.

The Muskoka Watershed Council is an organization whose mission is to champion watershed health according to the DMM Operating Principles (2003, amended 2016) and is a logical organization that could take on facilitating a collaborative, inclusive process in pursuit of IWM. However, there are many other organizations whose stated mission and mandate are similar to the MWM, creating confusion in

the greater community. There is merit in distinguishing the roles and responsibilities of the MWC, either apart from other organizations or considering strategic alliances in pursuit of a shared vison.

Although good governance underpins the watershed organizations highlighted in this study, the key to their success is centred more on their role in supporting and facilitating collaboration among key stakeholders. Many organizations have strong vision and mission statements and strategic and business plans, and they define their roles and responsibilities through strategic planning, which is essential for maintaining their credibility. More importantly, they all had created processes for collaboration and engagement, such as facilitating meetings, hosting workshops, etc., and taking on a role as champion to lead the collaborative work. Their success was less about a specific governance model, structure (e.g., framework) or name and more about providing the capacity to take on the role of convenor, facilitator and 'neutral/balanced integrator' on behalf of the watershed in pursuit of a common goal or vision.

Capacity (e.g., a coordinator or a designated partner organization) is required to support and facilitate a collaborative process. This role is fundamental to a collaborative's success. Having dedicated (human) resources allows for continuity, building relationships, 'connecting the dots, ' and facilitating shared learning. This role was a common element in the case studies. However, how this role was staffed in the case studies ranged from having a part-time coordinator to an executive director and a staff team. In addition, Warwick-Sears (2022) from the Okanagan Basin Water Board emphasized the importance of having long-term staff for building relationships with Board members and the community, ensuring the momentum of the collaboratives' work and maintaining institutional memory.

Watershed organizations profiled here built approaches to collaboration that best suited their local context and, in three cases used frameworks from the social sciences. For example, the Elizabeth River Project embraced the elements of Collective Impact to facilitate their ongoing work to achieve a healthy river. Collective impact, developed by Kania and Kramer (2011), is a framework for organizing disparate actors toward a common goal. It includes establishing a common agenda, setting progress measures, undertaking complementary or mutually reinforcing activities, and continuous communication. This collaboration framework is used by a 'backbone organization' dedicated to engaging and facilitating a group through various processes and activities that enhances shared learning. The Executive Director of the Elizabeth River project embraced Collective Impact to guide their collaboration work to create lasting solutions for the Elizabeth River.

The Long Tom watershed organization used a similar social infrastructure or collaboration approach called Impact Network**.** This approach uses *network principles* such as trust, not control, humility, not brand, node, not hub, and mission, not organization, and outlines five steps to build an effective impact network, including clarifying purpose, convening the right people, cultivating trust, coordinating existing activities and collaborating for systems impact (Stanford Social Innovation Review, 2015).

Collective impact and impact network approaches are grounded in social innovation that brings building people together around the same table. Much of IWM is people-centred and social innovation can unlock the potential for a group of disparate actors or organizations to come together to achieve more than any organization can do alone.

In contrast to Collective Impact and Impact Network, the Coquitlam River Roundtable used the Open Standards for the Practice of Conservation to help guide their collaboration and work. The Conservation Measures Partnership, a partnership of conservation organizations, oversees the Open Standards to

seek better ways to design, manage, and measure the impacts of their conservation actions. The Open Standards bring together common concepts, approaches, and terminology in conservation projects and program design, management, and monitoring to help improve the practice of conservation. Organizations can apply Open Standards at any geographic, temporal, or programmatic scale (CMP, 2020). According to Fielding (2011), the Coquitlam River Watershed Roundtable was the first organization in Canada to apply the Open Standards framework in developing a multi-jurisdictional collaborative watershed plan and among the first in the world to apply the Open Standards in a way that integrated ecological and human well-being goals.

Over the past 20 years, there has been a deliberate shift to collaborative governance of watersheds across Canada. As a result, watershed organizations are taking a leadership role in their communities to address local issues using a more comprehensive 'watershed approach' to planning. By nature, a more comprehensive approach will require a collaborative approach to bring key stakeholders to the table to identify local actions to address the issues.

It is essential to recognize that working toward IWM is challenging and elusive. The complexity and interaction of natural systems, human impact, climate change and overlapping jurisdictional boundaries are a few of the challenges. IWM is not a final goal to be achieved but rather an ongoing process requiring shared visions, collaboration and communication among many agencies, users and interests within the watershed. It takes time for relationships, trust and collaborative efforts to manifest. Since 2001, the MWC has built a strong foundation on the local knowledge base and social capital for pursuing IWM for the Muskoka. The next steps are to organize and align their assets (e.g., volunteers, relationships etc.), embrace a collaborative framework and pursue the development of a watershed plan with achievable actions in support of IWM.

Discussion References

Butterworth, J.; Warner, J.; Moriarty, P.; Smits, S. & Batchelor, C. (2010). Finding practical approaches to Integrated Water Resources Management. Water Alternatives 3(1): 68-81

Cabaj, M., & Weaver, L. (2016). Collective Impact 3.0. An evolving framework for community change. Tamarack Institute, Waterloo, ON. https://www.tamarackcommunity.ca/library/collective-impact-3.0-an-evolving-framework-for-community-change

Conservation Ontario. (n.d.). History of Conservation Authorities. https://conservationontario.ca/conservation-authorities/about-conservation-authorities/history-of-conservation-authorities/

Conservation Measures Partnership. (2020). Open Standards for the Practice of Conservation. https://www.conservationgateway.org/ExternalLinks/Pages/conservation-measures-par.aspx

de Loë, R. C. & Kreutzwiser, R. D. (2006). Challenging the status quo: the evolution of water governance in Canada. In Eau Canada: The Future of Canada's Water, ed. K. Bakker, 85-103. Vancouver: University of British Columbia Press.

Dietz, T., Ostrom, E., & Stern, P. C. (2003). The Struggle to Govern the Commons. Science, 302(5652), 1907–1912. https://doi.org/10.1126/science.1091015

District Municipality of Muskoka (DMM) (2003, revised 2016). Muskoka Watershed Council. Operating Procedures.

Fielding, G. (2016). Evaluating the Coquitlam River Watershed Roundtable Planning Process and the Open Standards for the Practice of Conservation Framework. MA Thesis, School of Environmental Management, Simon Fraser University.

Hardy, S. D., & Koontz, T. M. (2010). Collaborative watershed partnerships in urban and rural areas: Different pathways to success? Landscape and Urban Planning, 95(3), 79–90. https://doi.org/10.1016/j.landurbplan.2009.12.005

Heathcote, I.W. (2009). Integrated Watershed Management: Principles and Practice. 2nd ed. Hoboken, NJ: John Wiley & Sons, Inc.

ICWE (International Conference on Water and the Environment). (1992). The Dublin statement and report of the conference. International Conference on Water and the Environment: Development Issues for the 21st century, 26-31 January, Dublin, Ireland. https://www.ielrc.org/content/e9209.pdf

Kania, J. & Kramer, M. (2011). Collective Impact. Standford Social Innovation Review. Retrieved from https://ssir.org/articles/entry/collective_impact

Koontz, T. M., & Newig, J. (2014). From Planning to Implementation: Top-Down and Bottom-up Approaches for Collaborative Watershed Management. Policy Studies Journal, 42(3), 416–442. https://doi.org/10.1111/psj.12067

Melnychuk, N., Murray, D., & de Loë, R. (2012). Water Governance Challenges and Opportunities: Lake Windermere, British Columbia. Water Policy and Governance Group, University of Waterloo: Waterloo, ON.

Mitchell, B., Priddle, C., Shrubsole, D., Veale. B. (2014). Integrated water resource management: lessons from conservation authorities in Ontario, Canada. *International Journal of Water Resources Development 30(3).*

Nagurka, P, J. Orr, I. Picat, J. Smith, & Thompson-Deahl, C. (2013). Collective impact for environmental conservation. Global Impact.

Pratt Miles, J. D. (2013). Designing collaborative processes for adaptive management: four structures for multistakeholder collaboration. Ecology and Society 18(4): 5. http://dx.doi.org/10.5751/ES-05709-180405

Smith, J.L. (2008). A critical appreciation of the "bottom-up" approach to sustainable water management: embracing complexity rather than desirability. Local Environment 13(4) 353-366.

Stanford Social Innovation Review. (2015). Five Steps to Building an Effective Impact Network. https://ssir.org/articles/entry/five_steps_to_building_an_effective_impact_network#

Thompson, C. (2016). Collaboration. A Handbook from the Fund for Our Economic Future. https://www.thefundneo.org/collaboration-handbook/

Veale, B.J. 2004. "Watershed Management in the Grand River Watershed." In Towards a Grand Sense of Place, edited by J.G. Nelson, B.J. Veale and B. Dempster. 261-276. Waterloo: University of Waterloo.

Witzel, M., D. Smith, P. Arney, J. Beaucage, J. Cayley, C. Cragg, J. Miller, K. Trimble, and N. Yan. 2020. Report of the Muskoka Watershed Advisory Group (MWAG): Interim advice and recommendations to address priority environmental issues in the Muskoka River watershed. Report prepared for The Honourable Jeff Yurek, Minister of the Environment, Conservation and Parks.

Opportunities in Considering IWM for Muskoka

Introduction

During the research of this report, including interviews with key people active in the Muskoka Region, speaking with practitioners in other regions and the case studies reviewed, several potential opportunities for Muskoka Watershed Council became apparent. Indeed, there may be many others that emerge in time. The opportunities presented here are for consideration only and may or may not warrant further investigation, either in the short or long-term, according to the identified needs and next steps for the MWC.

Knowledge Bank

The MWC has a solid knowledge bank from which to draw upon. The longstanding history of the organization provides a long view of the watershed with numerous documents and studies on the history, assessment, flooding, etc. In recent years, funding from the province of Ontario has enabled approximately 12 studies in the watershed, including hydrology, natural assets, floodplain mapping, planning document review, and so on.

There is much known about the various pieces and components of the watershed. The salient question might be, is there a knowledge of how the watershed works as an ecosystem (e.g., natural systems, human interactions, upstream and downstream relationships, etc.), and furthermore, is this knowledge shared – among leaders and the public across the watershed? From the research and interviews conducted, this was identified as an area of need for professionals, industry, businesses, politicians, residents, cottagers, etc. Understanding how the watershed works beings by developing a conceptual model of the linkages within the watershed and a shared understanding. Using the MWC's watershed report cards might aid in developing this common understanding if it is used as a collaborative activity among key stakeholders and decision-makers.

Both MWC and committee members have a broad range of excellent expertise and experience to offer. Local knowledge, at times in combination with specialized areas of training such as planning, consulting, engineering, ecology, biology, etc., provide a strong community resource that might be appropriate as a technical advisory committee to a parent organization.

A good relationship with the DMM, other municipalities and staff, provides additional expertise and linkages to various departments and planning initiatives. This knowledge provides a solid foundation for the Muskoka area and, in most cases, takes years to develop. It would seem that Muskoka Watershed Council is in a favourable position in terms of knowledge here.

Social Capital

Time and time again, council members, DMM staff and other interviewees expressed both their trust in and the reputation of the MWC. Over time, the MWC has developed a strong advisory role for the DMM (and other municipalities) and is well regarded for both the advice they offer and its role in planning.

Many interviewees stated that there seems to be a lack of public awareness or understanding of the MWC – what it does and doesn't do. In addition, the distinction and/or similarities with other groups in

the area is unclear and confusing (e.g., Muskoka Conservancy, Friends of Muskoka, etc.). Education on the role and mandate of the MWC and developing a clear "brand" may prove useful.

When viewed in the context of the Long Tom or Elizabeth River cases, where social infrastructure was a key approach and well-established, there may be a gap in the presence of a strong resident and community social infrastructure (e.g., networking, landowners, public, etc.) for Muskoka.

The location of the MWC at the DMM offices facilitates efficiency, communication and operating costs. At the same time, it adds to the perception that the MWC is a branch of municipal government. This may act as a perceived barrier to participation. Simply moving off-site may not address the issue. The MWC may want to work on raising its profile in the community.

Partnerships and Strategic Alliances

Community - There are numerous community organizations in the Muskoka Region, such as lake associations, Muskoka Conservancy, Community Trust, Friends of Muskoka, Climate Action, etc. The public, and at times, the individual organizations themselves, may be unclear on the niche their organization fills and how it might relate to other organizations in the area. An opportunity to clearly define mandates and awareness among groups may prove useful in ascertaining community capacity. In particular, opportunities to combine fragmented efforts into a common vision, goals, purpose etc., where appropriate, could be instrumental in generating a larger synergy for the region. A detailed stakeholder analysis of the area's various groups, associations and not-for-profits can help develop alliances with the MWC.

One example cited in local interviews was Climate Change Muskoka. The group was noted for their ability to engage municipal Chief Administrative Officers across the region and to gain traction and momentum for climate action/agreement. This could be a group to contact for insights in mobilizing a sector, geographical area and/or broad partnership.

Larger Conservation Organizations - Partnerships with larger conservation organizations (e.g., Nature Conservancy of Canada, Land Trusts, Ducks Unlimited, etc.), can offer additional organizational capacity through increased visibility, access to grant funding, and in some cases, charitable donations and special conservation tools (e.g., acquisition, shoreline or natural area easements, etc.).

Academic Institutions – Academic institutions, especially post-secondary, added a great deal of capacity and in-kind work for many of the case studies. This consisted of a range of areas of study and support, including scientific data collection and monitoring, policy review and development, research on financial tools and long-term sustainable funding tools, education and promotional materials, etc. Typically, research funding was in place, so organizations incurred no additional costs.

Apart from forestry research in Dorset and possibly some wildlife studies in Algonquin Park, academic connections/partnerships appear to be lacking in the Muskoka watershed. An opportunity exists to reach out to academic institutions, perhaps within a half-day driving distance, but also beyond (as often site visits or field work are conducted for short-terms and/or seasonally). According to the needs of the group, consider building connections in subject areas of support required, including but not limited to the sciences.

Funding

Watershed case studies expressed an interest in greater financial autonomy and independence from the government. Although philanthropic donations are competitive and spread across many deserving causes and organizations, it was identified as an underused revenue source. In the Cowichan, a sister Watershed Society was established to streamline financial management and to accept charitable donations. Similarly, the Elizabeth River established a Living River Trust to take on supportive projects that aligned with the core group's mandate, as well as secure donations and create the ability to utilize conservation tools such as acquisition and shoreline easements.

BC Freshwater Legacy is presently working toward the establishment of a legacy conservation endowment of $600 million to provide long-term, sustainable funding to watershed conservation, independent from the government.

In the South Okanagan-Similkameen, a local conservation fund was developed with municipalities, conservation groups and residents.

There may be benefits in establishing a charitable organization or in partnering with another organization to create a joint conservation fund. The challenge here would be establishing a process for allocating dollars to subgroups or projects.

Researching creative, alternative and sustainable funding options for watershed management is a reasonable endeavour.

Framing Watershed Security

In BC, current initiatives are framing watershed health as a form of security – social, health, economic, etc. Following severe wildfires and flooding, BC embedded the creation of watershed conservation jobs into a covid economic recovery bill. Similarly, BC Freshwater Legacy highlights the economics of job creation, including tourism and creating natural defences against climate change (recent damage costs estimated between $10.6-$17 billion in BC) (Cull, 2022a, CBC, 2022).

There is an opportunity, while the Muskoka area is still relatively undeveloped and natural, to act proactively vs waiting to remediate adverse effects or further damage from climate change. Watershed security looks at safeguarding the watershed for long-term natural, social and economic well-being.

Economy

In Muskoka, the environment is considered the economy. Tourism, cottagers, outdoor enthusiasts, the service sector and local businesses rely heavily on the seasonal residents and visitors. At some level, there is recognition of this fact. Perhaps, a stronger or more tangible link needs to be illustrated. In BC, public campaigns are underway that highlight the connections between the health of the watershed and the jobs created that are related to it both directly and indirectly. The focus is on building a greater awareness that the health of the watershed, and the health of the economy, are inextricably linked. BC terms this area of economic activity as their 'watershed sector'.

Financial Sustainability

As Municipal Service Boards/Agreements, both the Okanagan and Severn can leverage taxation dollars to support activities and conservation within a watershed for the benefit of all. Certainly, this generates a larger amount in more populated and affluent areas.

Similar to the Okanagan, Muskoka is an affluent watershed. For example, assessed values in Bracebridge are estimated at $3.17 billion, in Gravenhurst at $3.35 billion, in Huntsville at $3.77 billion, In Lake of Bays at $3.2 billion, and the Township of Muskoka Lakes at $9.34 billion (DMM, 2022, 2019; MRA,2019, 2018) There is significant potential for funding watershed conservation through municipal taxation. It requires thinking not just in terms of infrastructure and services but truly recognizing the most valuable resources in the area that everyone is benefiting from. Perhaps, there is some form of surcharge or fee according to who benefits and who pays (e.g., waterfront property, cottagers, tourists, businesses), or attached to recreation goods and services (e.g., camping, kayakers, boaters, swimming, etc.).

Part of the challenge in Muskoka is the disparity between seasonal residents and affluent areas compared to the local population in towns and rural areas. The Okanagan uses a formula according to assessed value, such that each person contributes proportionately to their assets/ability to pay. In turn, projects are carried out equitably to benefit all in the watershed.

In Ontario, there may be a couple of mechanisms to explore in becoming a regional organization. First, under the Municipal Act, as a Municipal Services Board (as in the Severn). Second, under the Great Lakes Protection Act, (2015, S.O. 215, c 24) (https://www.ontario.ca/laws/statute/15g24), there may be provision to establish a geographically focussed area entity. There may be other opportunities to investigate.

Taxation is never a popular choice and politicians and municipalities are constantly under pressure to limit any fees or increases. However, the potential for conservation revenue in Muskoka cannot be overlooked. It will require a great deal of open discussion by all, and ultimately, some degree of public buy-in. That will depend on how watershed health is framed and if people are willing to truly value it in a tangible way.

Role

The MWC has established itself as a valued advisor in planning issues in the Muskoka Watershed. In fact, their primary role has been that of a reviewer and commentator. The watershed organizations reviewed as case studies also played an important role in an advisory capacity. However, the most critical role for each organization was as a facilitator in bringing all parties together and maintaining ongoing communication and momentum of the group. It may be worth considering how MWC might move to take on a prominent role as a convenor. The need for a champion (along with a watershed coordinator) was established earlier in this report.

Messages and Public Relations

Much relies on the public image of any watershed organization and the perceived importance/relevance of issues to individuals in their daily lives. While IWM may be the over-arching, desired process, such terminology tends to speak to professionals, practitioners and academics and less to the general public. Similarly, organization names such as boards, councils, and roundtables elicit little public reaction

regarding the work undertaken. In the case studies, although they had essential, governing documents that included vision, values, mission statements, etc., to guide their work, many also adopted a common, friendly message for their campaigns and public relations materials. For example, in the Grand River, a campaign centred on the slogan “Share the Resource, Share the Responsibility;” the Elizabeth River states “Our River Needs You. Do Something Beautiful;” in the Long Tom, they highlight “Neighbours Working Together for a Healthier Community;” and the Okanagan frames the priority as “One Vally, One Water.”

Opportunities References:

District of Muskoka, (2022). By-law 2022-5, Schedule B – General Tax Rates and Levies. www.muskokacivicweb.net.

District of Muskoka, (2019). By-law 2019 –22, Schedule B – General Tax Rates and Levies. www.muskokacivicweb.net.

Muskoka Ratepayers Association, (2019). Economic Snapshots – Winter 2019.

Muskoka Ratepayers Association, (2018) Economic Snapshots – Fall 2018.

Papequash, V. (Dec. 8, 2022). B.C. gets first minister on emergency management, climate readiness. www.cbc.ca/news/canada/british-columbia

Tull, C. (2022a). BC’s Unprecedented weather disasters require bold investment in watershed security. The Globe and Mail, OP ED, May 13, 2022. Toronto.

Appendices

Appendix: A. List of Interviews

Muskoka Interviews

Person	Position	Organization	Date
Kevin Trimble	Past Chair	Muskoka Watershed Council	Aug. 25/22
Deb Martin-Downs	Member	Muskoka Watershed Council	Sept. 9/22
Peter Sale	Chair	Muskoka Watershed Council	Sept. 9/22
Michael Peppard	Councillor	Lake of Bays	Sept. 13/22
Patricia Arney	Member	Muskoka Watershed Council	Sept. 19/22
Geoff Ross	Past Chair	Muskoka Watershed Council	Sept. 27/22
Glenn Cunnington	Manager, Watershed Prog.	District of Muskoka	Sept. 28/22

Case Study Interviews

Name	Position	Organization	Date
Julie Cayley	Executive Director	Severn Sound Environ. Assoc.	Sept. 30/22
Barbara Gavin	River Star Homes Program	Elizabeth River Project	Oct. 6/22
Anna Warwick Sears	Executive Director	Okanagan Basin Water Board	Oct. 17/22
Dana Dedrick	Special Projects Lead, Executive Director at outset of organization	Long Tom Watershed Council	Oct. 18/22
Margaret Birch	Original co-founder, now Support & Liaison	Coquitlam River Watershed Roundtable	Nov. 2/22

Consult/Support Interviews

Name	Position	Organization	Date
Coree Tull	Director, Government Relations/Engagement	BC Freshwater Legacy	Sept. 23/22
Natalya Melynchuk	Water Policy Advisor PhD	Province of BC Univ of Guelph, IWM in BC	Oct. 12/22
Barbara Veale	Senior Director, Watershed Strategies & Climate Change PhD	Conservation Halton Watershed Organizations in Canada	Report Review Dec. 2022
Dan Shrubsole	Associate Dean Professor	Faculty of Social Science; and Department of Geography & Environment, Western (Integrated Water Management)	Report Review Jan. 2023

Appendix: B. Other case studies considered

Watershed/ Organization	Size	Drivers	Gov	NGO/NFP	Other Notable Characteristics
Coastal Watershed Council, CA https://coastal-watershed.org/san-lorenzo-river/about-the-river/	137 mi^2	Industry, lime, leather, lumber Flooding 1955, levees constructed to protect Santa Cruz Drinking water protection		Yes	The Coastal Watershed Council is a 501(c)(3) non-profit 4 staff – 1 ex direct/2 education/1 ecologist
Galinas Watershed Council, San Rafael, CA https://www.gallinaswatershed.org/		unpopulated		Yes	Gallinas Watershed Council (GWC) is a group of concerned citizens who live and work in **Las Gallinas Valley**, North San Rafael, Marin County. We are a 501c(3) Non-profit fiscally sponsored by **MarinLink.**
Scott River Watershed Council, Etna, CA https://www.scottriver.org	814 mi^2	Klamath River Basin		Yes	Est. 1992 Non-profit 2011
McCloud Watershed Council, CA https://www.mccloudwatershedcouncil.org/		Contains Shatsa Watershed Association From Ulbarri & Garcia (2020)		Yes	
Merced River Watershed Council, CA Yosemite at upper http://www.merced-river.org/AboutUs3.html	1,726 mi^2	Water quality Wild and scenic river - upper		Yes	2001 – Watershed Coordinator Grant through county conservation district 2008 – 501 non profit
Dungeness River Management Team Olympic Peninsula, WA http://dungenesswc.s3-website-us-west-2.amazonaws.com/about.htm	198 mi^2	Clear-cut logging, slopes unstable, Salmon population, water diversions for agriculture Floodplain, riparian damage Genskow & Born (2006)		?	Originally citizen driven – evolved to MOU with Dept of Environment. Highly successful for 4 yrs, disbanded. Re-established 1995
Peugeot Sound, WA **Nisqually River Task Force, then Council** https://nisquallyriver.org/ **Nisqually River Foundation** https://nisquallyriver.org/who-we-are/nisqually-river-foundation/	700 mi^2	Least developed but increasing threats from forestry, agriculture, urban spread, non-point pollution	Yes	 Yes	Gov't enacted water plan & task force, 28 member agencies make-up council, plus citizen advisory committee 501 (c) (3) Non-profit – provide for staffing and funding
Tomorrow-Waupaca River Watershed Association, WI Evolved to TWRW Project	300 mi^2	High nitrate levels - Agricultural practices, urban development and runoff, streambank erosion	Yes	Part	Citizens, state agencies, county government Funding from DNR, counties, landowners

Black Earth Creek Watershed Association, (west of Madison, WI) https://www.becwa.org/	100 mi^2	Agricultural nonpoint source pollution and degraded stream banks; urban runoff; and urbanization and development		YES	BECWA, a 501(c)(3) non-profit organization, consists of agricultural & urban landowners, recreationists, local development, environmentalists, local officials, other interested parties. Serves as a citizen advisory body to the Black Earth Creek Priority Watershed Project, managed by the Dane County Land Conservation Department with assistance from DNR
Upper Little Tennessee River Watershed Association, NC https://www.littleriverwatershed.org/	783 mi^2			Yes	Citizen-led association and multi-agency advisory group. Partners emphasize riparian and water quality restoration and protection throughout the Upper Little Tennessee River watershed The LRWA is a 501(c)(3) non-profit organization,
Organizations with Flooding Response					
Merrimack River Watershed Council, NH/MA https://merrimack.org/	5,000 mi^2,	Toxic water quality, est 1976 Now, one of the cleanest Historic and Recent flooding (esp Town of Tewksbury) Hazard mitigation and climate resilience plan		Yes	501 non profit 9 staff – exec direct. policy, restoration, water management, education, etc.
Huron River Watershed Council, Ann Arbor, MI www.hrwc.org **Residents Working Against Huron Flooding** *www.* *Residentsworkingagainsthuron flooding.org*	900 sq mi	Drought, water pollution Cleanest urban river in Michigan, Historical problems and committees date back to 1958 Watershed Council est. 1965 Recent flooding Co-founded by academic & resident; and a resident, township council on flooding Chair of Ore Lake Resorts Assoc. Lake flooding also.	Yes Munic	 Yes	Public Act 200 of 1957 provided the basis for the local units of government to establish a cooperative information, research, and consultative agency to tackle multi-unit problems. Huron River Watershed Intergovernmental Committee (HRWIC), was formed in April 1958. Four counties, eight cities/villages, and twenty townships joined. Est 1965 as HRWC Funding – govt – foundations- individuals 15 staff – exec direct. watershed planners, ecologists, educators, outreach Est. 2022(?) - Received $150,000 grant with Army Corps engineers to examine flood mitigation

Appendix: C. Types of watershed organizations.

Types of Watershed Organizations

Advisory Committee ~ A formalized or quasi-formal organisation in which individuals take responsibility for undertaking action planning and provide advice; governments 'hand over' strategic planning to such organisations; they frequently have no or limited legal jurisdiction

Authority ~ An organisation which makes planning decisions at a central or regional government level; may set and enact regulations, or have development consent authority.

Association ~ Similar to an Advisory Committee, this is an organisation of like-minded individuals and groups with a common interest. In a river basin they have varying roles: providing advice, stimulating basin awareness, education and ownership of basin natural resources management issues; educational functions and information exchange.

Commission ~ An organisation which is delegated to consider natural resources management matters and/or take action on those matters. A basin commission's powers vary, and include advisory/education roles, monitoring roles, undertaking works, fulfilling goals of a specific government's charter or an international agreement.

Council ~ A formal group of experts, government ministers, politicians, NGOs and lay people brought together on a regular basis to debate matters within their sphere of basin management expertise, and with advisory powers to government. A council is contrasted with a commission which, although also a body of experts, is typically given regulatory powers in addition to a role as advisor to the government.

Corporation ~ A legal entity, created by legislation, which permits a group of people, as shareholders (for-profit companies) or members (non-profit companies), to create an organisation, which can then focus on pursuing set objectives, and empowered with legal rights which are usually only reserved for individuals, such as to sue and be sued, own property, hire employees or loan and borrow money. Also known as a "company". The primary advantage of a for-profit corporation is that it provides its shareholders with a right to participate in the profits (by dividends) without any personal liability because the company absorbs the entire liability of the organisation.

Tribunal ~ A basin entity which has formalized procedures and quasi-judicial powers; a heavy emphasis on bureaucratic decision making; stakeholders may formally participate through hearings; major decisions are taken by independent bodies, like a water pricing tribunal. A Tribunal acts as a special court outside the civil and criminal judicial system that examines special problems and makes judgments, for example, a water tribunal, which resolves disputes between water users.

Trust ~ A trust is legal device used to set aside money or property of one person for the benefit of one or more persons or organisations. It is an organisation which undertakes river basin works; develops and implements a strategic plan; its mandate is to be the river basin 'advocate'; it co-ordinates local programs through Memoranda of Understanding or other agreements; it raises local levies (funds) for is works and programs. A Trust keeps monies raised in 'trust' for the benefits of its citizens.

Federation ~ A collaboration of organisations or departments within one government or between state and national governments to establish and undertake actions for river basin management. Governance actions at various levels (national, state and local) include: agreements on water sharing and water quality management, shared statements of intent; shared policy development; information exchange; joint actions for management of ecosystem degradation.

(Hooper, 2005)

Other types or names of organizations not listed here and relevant to the case studies are:

- **Council** – a watershed council is a grass-roots organization dedicated to helping local communities to identify natural resource issues in their local area and to implement voluntary, collaborative solutions to issues;
- **Board** – similar to commissions and may be in an advisory/education, monitoring or regulatory role in fulfilling agreements. At times, they may develop or enforce policies outlined by government;
- **Municipal Services Board** – local municipal body that manages and delivers services such as a library, transportation, police services, board of health, etc.; and
- **Roundtable** - similar to advisory committees, but are typically broader in focus, looking at opportunities for collaboration across various sectors or groups.
- **ENGO** – environmental non-government organization. May operate locally or internationally, in environmental issues. As non-government entities, they are able to receive funds from private donors, corporations and other institutions. Unlike environmental movements, ENGOs have constitutions that state the rules of how power gets distributed among the membership. Not typically watershed-based, but can be - in this case (and others).

(LTWC; participedia.net; ontario.ca; sciencedirect.com)

Appendix: D. Case Study Interview Questions

Case Study Interview Questions (Muskoka Project) Date: _____

Organization: _____

Contact Person/Position: _____

1. Watershed Characteristics	
a. Size – approx. area b. Sub-watersheds? c. Natural Heritage Features d. Issues/Drivers in watershed e. Urban/Rural population, # major centers, # municipalities, districts, etc. f. Main economy/employer	
2. Organization	
a. History b. Enabling legislation c. Status (NGO, Not-for-profit) d. Mission/Mandate e. Size, staff, expertise, capacity, access to resources f. What types of projects do you carry out?	
3. Structure/Governance of Organization	
a. Do you have a board, committees, etc.? How are they structured/appointed? Representation across the watershed? To who/what are you accountable? b. Do you have a governance document? Bylaws, Strategic Plan? Watershed Plan? Describe. c. Describe your planning process. Who initiates/coordinates? Who involved? Reporting progress? d. Decision Making – How are issues prioritized? How are decisions made? e. Who are the major decision makers for local watershed management? How do these or other organizations affect watershed management? f. Describe how the community views your organization. Trust?	

Legitimate, respected, gov't agencies, are you consulted?	
4. Collaboration/Governance	
a. What organizations do you partner with and/or co-lead? Local, state/provincial, federal? Please list names. b. Describe any formal/informal agreements in place? Does legislation enable these? c. Describe any interjurisdictional relationships? d. Leadership – Does your organization play a leadership/integrator role or is it more a support and collaboration role in bringing together multiple agencies, community groups? Who is the local champion driving the process? Are there objections to collective watershed management? Who would have influence to veto?	
e. Are roles & responsibilities of all stakeholders specified and understood? How? f. What are your strengths & weaknesses in collaborative IWM? g. What internal & external factors do you think affect local IWM? h. What would promote improved collaboration?	
5. Funding & Resource Supports	
a. How are you funded? (approx. budget). Public or private sector? Mix? Levy? Cost-sharing? b. How is your funding stable? Vulnerable? Challenges? c. How is funding +/or projects allocated across the watershed? (i.e., needs, population, *equitable*, outlying areas)	
6. Communication/Engagement	
a. How do you *identify and engage* decision-makers? How do you *communicate* with community groups and the public across the watershed? (e.g., news, campaigns) How do you *engage* the broader public?	

7. Other	
a. Do you have any key documents to share?	
b. Is there any info you would like to share that has come to mind after our conversation?	
8. Adaptability	
a. How does your organization adapt to change? Leadership Funding Political situation Environmental conditions (e.g., climate change)	

Appendix: E. Long Tom Watershed Charter

Long Tom Watershed Council
Charter

Prepared by the Charter Team in meetings and discussion from April 8 to July 8, 1998.
Presented to the Council at interim stages by mail & at meetings from April through July.
Reviewed and edited by the Interim Steering Committee in June and July.
Full draft submitted to the Council by mail in July.
At July 28, 1998 Council meeting, an enthusiastic and full consensus of the people present approved our Charter.
At the October 2003 Annual Meeting, the Charter was amended by a fully supportive consensus.

Mission and Goals

Mission

The Long Tom Watershed Council serves to improve water quality and watershed condition in the Long Tom River basin through education, coordination, consultation, and cooperation among all interests, using the collective wisdom and voluntary action of our community members.

Purpose

The Council will provide opportunities for people who live, work, play, derive benefits from, or are affected by the Long Tom watershed to cooperate in promoting the health of the watershed and communicating the social and economic benefits to the community.

Vision

A healthy watershed that ensures water quality and riparian and wetland habitat for fish, wildlife, and native plants while recognizing the importance of people's economic livelihood and quality of life.

Goals

1. Maintain and improve water quality.
2. Enhance habitat, especially riparian and wetland habitat, for fish and wildlife.
3. Encourage communication, learning, and participation among people with interests in the watershed.
4. Promote continued benefits from a healthy Long Tom Watershed.
5. Help people get the assistance they need for watershed enhancement plans and projects (educational, technical, financial, etc.).
6. Gather, verify, and share information on current and past watershed conditions.
7. Recommend ways that citizens, organizations, and local, state, and federal governments can help achieve the goals of the Long Tom Watershed Council.
8. Educate, motivate and provide feedback to all interested persons in the watershed working toward these goals.

Organization

Council

The Council is an ever-changing group of interested people from the Long Tom watershed, including related community, business and government groups, who meet to work toward the Mission and Goals as defined by this Charter. A varying number of smaller groups (teams and committees) exist as subsets of the Council to help handle organizational matters, on-the-ground projects, monitoring, outreach and education.

Long Tom Watershed Council membership is fully inclusive and open to anyone who lives, works, or plays in, derives benefit from, or is affected by the watershed and its resources. A member is someone who participates in council activities. After each meeting the sign-in list is used to put newly interested members on the mailing list. This list confers membership.

Being a member is simple and not restrictive. It indicates an interest on a person's part in receiving the newsletter, an interest in taking part in activities of the council, and a willingness to consider local Council involvement as a way to achieve meaningful improvement in watershed conditions. Council membership implies support of individual and group efforts to improve watershed conditions in the Long Tom River basin. The Council recognizes and supports the right of Council members to make decisions about their own actions and property. The Council will work to create a supportive community atmosphere by encouraging communication, learning, and participation among members.

The Council will focus on encouraging small groups to form and tackle an issue, project or task, and encouraging people to participate with time and energy in Council activities as they see fit. The Council will offer general calls for volunteers at meetings and in mailings as well as directly requesting people to volunteer based on skills they have. All members will have opportunities to participate in making decisions by consensus.

Steering Committee

The Long Tom Watershed Council is guided by a standing Steering Committee. The Steering Committee supports and ensures communication among people of the watershed, maintains continuity among Council activities, and monitors progress toward the Council's Mission and Goals. The Steering Committee also gives feedback to the coordinator, makes staffing and operating decisions, oversees any fiscal operations, facilitates team development, and serves to represent the Council. The Steering Committee reports back to the Council on their topics of discussion, recommendations, and decisions at the full Council meetings.

The Steering Committee is a diverse group both geographically and by interest. Potential Steering Committee members volunteer from the Council membership and are affirmed by the full Council. Ideally, there will be a group of twelve serving on the Steering Committee. Each member of the Steering Committee serves to bring a perspective of a different part of the watershed to the table as well as keeping in mind the big picture, which is serving all the members of the Council as we work toward the Mission and Goals.

The geographic diversity on the Steering Committee is organized as follows: three people from each of the main sub-basins of the watershed (Upper Long Tom, Lower Long Tom, and Amazon), and three people at-large. The diversity in interests in the watershed will be tracked by the Search Committee.

Steering Committee members will serve for a term of three years. Rotation of members will be staggered to maintain continuity. Terms will transfer the day after the Annual Meeting and/or Celebration or upon affirmation of the new Steering Committee. End-of-term vacancies will be filled with full Council approval. Mid-term vacancies will be filled for the duration of the term with full Steering Committee approval.

The Steering Committee will have a Chair, Vice-Chair, Secretary and Treasurer. These people will be chosen or reaffirmed by the Steering Committee at their first meeting after annual changes in the

Committee.

Search Committee

The Search Committee is an ad-hoc group responsible for identifying candidates willing to volunteer for the Steering Committee. Each year before the Annual Meeting and/or Celebration, the Steering Committee will appoint at least three people to the Search Committee and announce vacancies on the Steering Committee. The Search Committee includes people from each of the sub-basins, and works to ensure a diverse slate of candidates to recommend for affirmation at the Annual Meeting and/or Celebration. Selection and endorsement work sessions may be held at the two full Council meetings prior to the Annual Meeting and/or Celebration for sub-basin discussion and endorsement of candidate Steering Committee members.

Technical Team

The Technical Team is a standing committee comprising people with scientific backgrounds or technical expertise. Its function is to help the Council meet its goals regarding improved watershed conditions through enhancement plans and projects. The Technical Team will review projects presented to the Watershed Council for feasibility and appropriateness. If any prioritizing is needed for funding requests, equipment or technical assistance, the Council will make those decisions based on the recommendations made by the Technical Team and the Steering Committee.

Other Committees and Teams

Any members of the Council can form groups, as suggested here: 1) *Project Teams* who have a specific task (such as a stream restoration project or a fair booth); 2) *Ad-hoc Committees* or teams which are short-term groups involved in council organization or other activities (such as a Charter Team, Staff Selection Team, or Annual Meeting and/or Celebration Committee); or 3) *Standing Committees* which are long-term groups involved in council organization (such as Steering Committee, Council Development) or with specific interests (Education Committee). To be recognized as part of the Council, these groups must communicate their focus, general time-lines, meeting information, and membership to the Steering Committee and share their recommendations and activities at Council meetings.

Meetings

At least six meetings of the full Council are held each year. The meeting location should rotate among the three sub-basins to allow for rotation of the Annual Meeting and/or Celebration venue and hosting responsibility as well as to provide people with limited transportation an opportunity to attend at least some Council meetings near home.

An Annual Meeting and/or Celebration will be held to celebrate work accomplished, honor those involved, affirm new Steering Committee members, review the Council membership, and amend the Charter as needed. Agenda items for discussion should be submitted to the Steering Committee no later than the last Council meeting prior to the Annual Meeting and/or Celebration.

The Steering Committee will meet as often as necessary to conduct the business of the Council, and ad hoc committees will meet as often as necessary to complete their tasks.

All meetings are open to anyone interested in attending.

Decisions

Matters of substance, such as Council direction and project prioritization for grant funding will be discussed by the Steering Committee. The Steering Committee will make recommendations to the full Council for discussion and decision by consensus of those Council members present.

General operating decisions, including staff and fiscal decisions, will be made by the Steering

Committee. Steering Committee decisions will be made by consensus of those present. A quorum is two thirds of the Steering Committee membership. All Steering Committee decisions are recorded at their meetings and made available at full Council meetings for review.

All decisions made by the Council or any sub-group, committee or team, are made by a consensus of those present. If a consensus is not reached during the first discussion, the issues of conflict will be identified by the Council and an ad-hoc team will form to address those points. This team should involve at least one of those who did not support the decision and those who are willing to discuss it or have skills that would be helpful in making progress. Attempts will be made to re-frame the question, issue, or problem and recommendations can be made to consider bringing in a professional to assist the group. The ad-hoc team will meet and report back at the next main meeting when a consensus will again be called for. In the event of continued conflict, this process will be repeated but after two unsuccessful attempts for consensus, the group will vote by super-majority (70%) to choose whether to: a) decide the issue by super-majority vote or b) table the decision with suggestions on ways to make future progress.

Information

Agendas will be sent to all Council members before Council meetings as long as funding or in-kind services allows. All pertinent information received or generated on behalf of the Council will be kept in places accessible to the public and efforts will be made to share that information and help people find answers to their questions.

Amendments

Amendments to the Charter are to be proposed in writing to the Council or Steering Committee any time up to two months before the Annual Meeting and/or Celebration. If the change is substantial, presentation to the Council of the proposed amendment by the person submitting the change is encouraged. An Ad-hoc Charter Team will form to review the changes and present them at the Annual Meeting and/or Celebration along with their recommendations. Amendments to the Charter are approved by consensus of the Council members present.

Appendix: F. Timeline of key events for the Long Tom Watershed Council from 1997 to 2012.

Long Tom Watershed Council
Timeline of Major Events

1997 Spring Summer	• Residents in Upper Long Tom sub-basin gather to discuss **forming** watershed council. 80 people join conversation at various times. • First **Council Support grant funded** by Governor's Watershed Enhancement Board
1998 January	• Council **Coordinator** is hired. **Interim Steering Committee** established. Forming council **reaches out** to entire Long Tom River watershed. • Regular **monthly meetings** with **education** and business components begin.
July	• Council reaches consensus on **Charter** • Watershed **Assessment** Grant funded – work begins.
September	• First **Annual Celebration** held – Amazon sub-basin, Willamette H.S. • **Steering Committee affirmed** for 1998-99
October	• Lane and Benton County Commissions **formally recognize** council
1999 July	• Formal commendation **received from Oregon Watershed Enhancement Board for council's activities during first two years.** • Council Support grant funded **for 99-01 by OWEB** • Water Quality Monitoring Program **grant funded for 99-01 – work begins**
	• Watershed Coordinator begins Willamette and Statewide electronic list-servs to network fellow coordinators • Regular **monthly meetings** continue with **education** component being preliminary findings from watershed assessment
September	• Second **Annual Celebration** held in Lower Long Tom sub-watershed with hosts, the Stroda Brothers Farm • **Steering Committee affirmed** for 1999-2000
1999- 2007	• Water Quality Monitoring Program determining pollution sources in basin, with refined objectives and sampling design every 2 years
2000 January	• **Assessment is finished** by Cindy Thieman and gains formal commendation from OWEB; forums conducted to share findings.
	• Regular **monthly meetings** continue with **education** and business components, including summer **tours and field trips**.
	• Won the **People's Choice Award** in conjunction with other watershed councils for our outreach efforts at fair booths such as the Lane County Fair.
	• Began submitting factual articles to the **West Lane News** and **Tri-County News**
September	• **Water Quality Monitoring and Demonstration Restoration Projects grant submitted** for 01-03 to OWEB • Third **Annual Celebration** held in Upper Long Tom sub-basin with our hosts, the Allison Family • **Steering Committee affirmed** for 2000-01

\\ILMOREW3FP3\Long_Tom\Organization & Management\Structure & Development\Overviews of Council\Timeline major council events.doc

	• ***Spirit of the Oregon Plan Award*** given to Watershed Coordinator Dana Erickson by Gov. John Kitzhaber
2001-Current	• **Regular Council Meetings** include demonstration tours, panel discussions, and presentations of issues, plans and survey results • **Restoration Program** addressing priority projects in the basin
September	• Fourth **Annual Celebration** held in Amazon sub-basin, West Eugene Wetlands
2002	• Fifth **Annual Celebration** held in Lower Long Tom sub-watershed with hosts, the Horning family
2003	• Sixth **Annual Celebration** held in Upper Long Tom sub-watershed on the Oregon County Fair property
2004	• Council is founding member of Network of Oregon Watershed Councils (NOWC); Coordinator serves as Treasurer and Contract manager
September	• Seventh **Annual Celebration** held in Upper Long Tom sub-watershed with hosts, the Stillwater Farm
2005 October	• Eighth **Annual Celebration** held in Lower Long Tom sub-watershed in the Junction City, Scandia Hall
2006	• Watershed Coordinator and NOWC are instrumental in joint messaging for local implementation of Oregon Plan through Watershed Councils & SWCDs to Oregon Legislature
October	• Ninth **Annual Celebration** held in Upper Long Tom sub-watershed at Our Daily Bread Restaurant
2007	• **Water Quality Summit** held
October	• Tenth **Annual Celebration** held in Amazon sub-basin, Eugene Yacht Club
2008	• Council applies for and gains tax-exempt status, brings fiscal management in-house • **Restoration Program completes 30th restoration project**
September	• Eleventh **Annual Celebration** held in Lower Long Tom sub-watershed with hosts, the Stroda Brothers Farm
2009	• Council receives **10-year grant** funding from **Meyer Memorial Trust and begins the Model Watershed Program**
September	• Twelfth **Annual Celebration** held in Coyote Creek sub-basin with hosts, the Mattsons at Polyrock Ranch
	• Council receives the **Science & Practice of Ecology & Society Award** from the International *Journal of Ecology & Society*
2010	• **Restoration Program completes 50th restoration project**
October	• Thirteenth **Annual Celebration** held at the Inn at Diamond woods in the Lower Long Tom sub-basin.
2011	• Councils work is featured for the January issue of ***Science Findings***
September	• 14th **Annual Celebration** held in Lower Amazon sub-watershed with host Jason Hunton of Huntons' Farms
2012	• Meyer Memorial Trust receives prestigious award on behalf of the Willamette River Basin, based on their accomplishments with partners including LTWC!
November	• 15th Annual Celebration held in Upper Amazon at the Vets' Club

\\ILMOREW3FP3\Long_Tom\Organization & Management\Structure & Development\Overviews of Council\Timeline major council events.doc