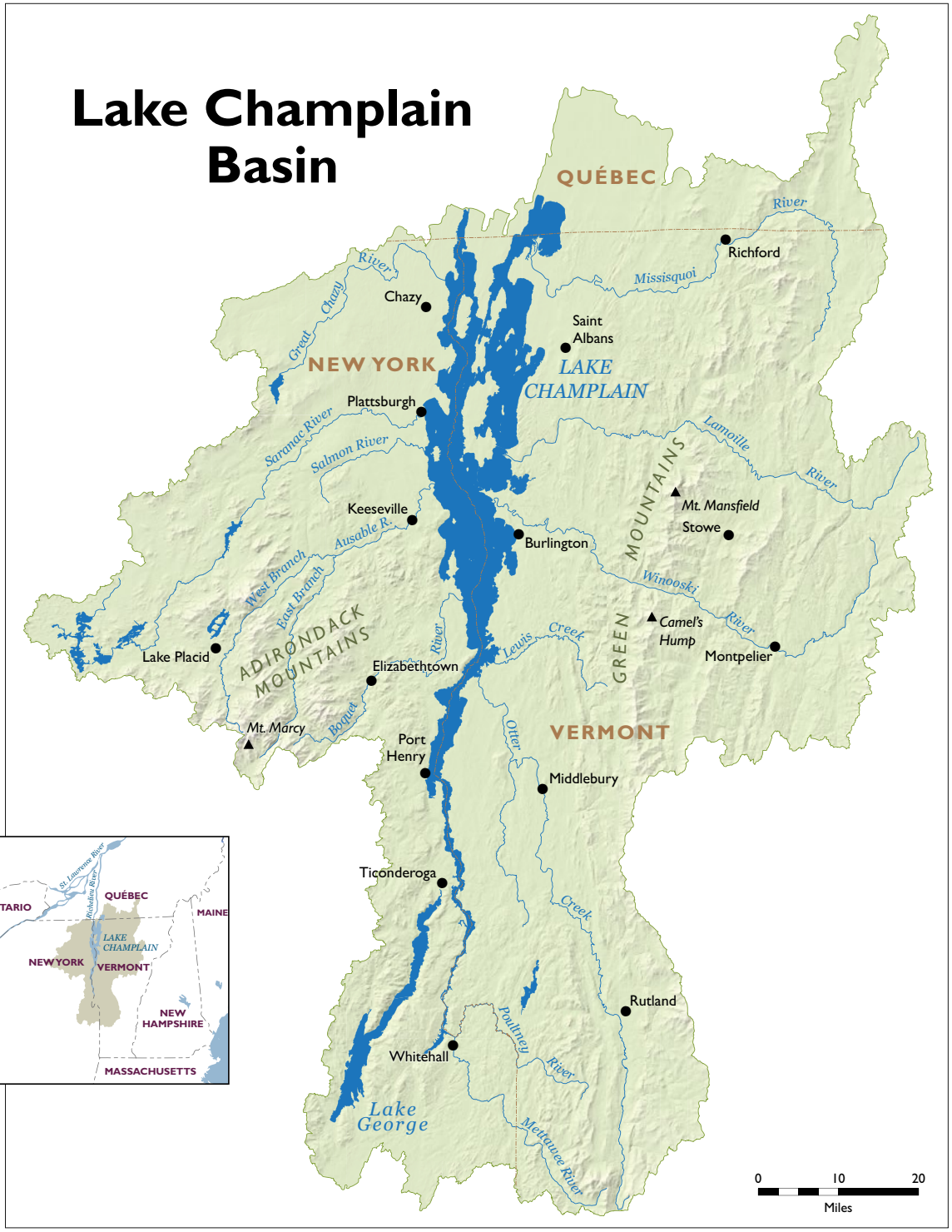
OPPORTUNITIES FOR ACTION

An Evolving Plan for the Future of the Lake Champlain Basin

2022

The Lake Champlain Basin



Cover Photo: Adobe Stock

To the Lake Champlain Community:

On behalf of the States of New York and Vermont and the U.S. Environmental Protection Agency, we are pleased to approve this revision of *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin.*

Opportunities for Action provides a comprehensive overview of the mission of the Lake Champlain Basin Program and the scope of its work. The plan was first approved in 1996. This fifth version carries forward the organizational structure introduced in the 2017 plan and continues to advance critical objectives that address the goals of that plan: clean water, healthy ecosystems, thriving communities, and an informed and involved public. The 2022 plan includes as overarching themes the mitigation of climate change impacts in the Lake Champlain watershed and a focus on including diverse voices and communities with environmental justice concerns in this work.

With this plan, the LCBP will support and promote innovative solutions to lake and watershed management challenges; prioritize and conserve critical parcels of habitat; take additional actions to prevent the introduction and spread of new invasive species; enhance interpretation of the region's rich cultural heritage and its connection to the Lake; and increase and expand engagement with all stakeholders. The plan will foster partnerships, one of the LCBP's greatest strengths, so that coordinated and informed management of the Lake Champlain basin continues to move forward at all levels.

Implicit in our approval of this plan is the continued commitment of our agencies, to the extent of our respective authorities, to maintain and enhance our support for the management goals for Lake Champlain outlined herein. It also represents the continued commitment of federal and state partnerships to working toward common goals highlighted in this plan. This plan will direct Lake Champlain Basin Program resources to 1) advance our understanding of issues facing Lake Champlain, 2) directly solve watershed problems contributing to the Lake's pollution and degraded ecosystem, and 3) promote individual and community actions to improve Lake Champlain.

We call on you, the stakeholders of the Lake Champlain basin, to join us in this commitment to restore and protect your lake for the enjoyment of future generations. Our communities can be the most powerful partnerships and voices working for Lake Champlain, and working together, in time we all can achieve our shared goals for this lake.

We congratulate the Lake Champlain Basin Program, the Lake Champlain Steering Committee, advisory committee members, and staff for their work on this revision of Opportunities for Action. We look forward to continued cooperation among all our partners and stakeholders to achieve the actions and goals outlined in this plan.

for
Philip B. Scott
Governor of Vermont

Kathleen C. Hochul
Governor of New York

David Cash
Administrator
EPA Region 1

for
Lisa Garcia
Administrator
EPA Region 2

Québec

Gouvernement du Québec
Le premier ministre

Message du premier ministre du Québec

Le renouvellement 2022 du plan d'action pour le lac Champlain
La force du partenariat

Le bassin du lac Champlain est depuis très longtemps d'une grande importance pour les Québécoises et les Québécois. Se situant de part et d'autre de notre frontière commune, le bassin se prolonge au Québec avec celui de la rivière Richelieu et du fleuve Saint-Laurent. Avec nos amis du Vermont et de l'État de New York, nous bénéficions des vastes richesses naturelles et de la dynamique économique reliées à cette situation géographique exceptionnelle.

Avec ces bénéfices partagés viennent de grandes responsabilités communes. Nous avons le devoir de protéger et promouvoir cette région que le monde entier nous envie pour sa grande beauté. Les défis sont nombreux, à commencer par la lutte contre les changements climatiques et la protection de la biodiversité. La sécurité humaine est aussi au cœur de nos préoccupations, notamment après les importantes inondations subies ces dernières années.

Forts d'un partenariat construit au cours de nombreuses années, le Québec, le Vermont et l'État de New York poursuivent leurs engagements en renouvelant le plan d'action pour la restauration et la protection des eaux et des ressources naturelles du lac Champlain. Intitulé *Perspectives d'action : un plan progressif pour l'avenir du lac Champlain*, la cinquième édition de ce plan constitue à nouveau un modèle particulièrement inspirant de démarche de développement durable et de gestion intégrée des ressources en eau.

La révision du plan d'action a été conduite grâce aux efforts constants du comité directeur du Programme de mise en valeur du lac Champlain (*Lake Champlain Basin Program,* LCBP), dont le rôle est inscrit dans l'Entente de coopération en matière d'environnement relativement à la gestion du lac Champlain qui lie les gouvernements du Québec, du Vermont et de l'État de New York depuis 1988.

Les objectifs du plan d'action 2022 du LCBP ont été établis en s'appuyant sur une consultation encore plus large des organisations intéressées. Ils tiennent compte aussi des recommandations des citoyens soucieux de restaurer et de protéger les ressources naturelles du bassin, tout en préservant les activités économiques essentielles de la région. Le plan propose des actions en ce sens, encourageant ainsi le développement d'une communauté prospère, unie et impliquée, et ce, de part et d'autre de la frontière.

C'est donc avec le même enthousiasme que le Gouvernement du Québec remercie et félicite les équipes et le comité directeur du LCBP pour le travail accompli et s'engage de nouveau à participer très activement, aux côtés de ses partenaires du Vermont et de l'État de New York, à la gestion du lac Champlain et de son bassin, au bénéfice des générations actuelles et futures.

François Legault

Québec

Gouvernement du Québec
Le premier ministre

Message from the Premier of Québec

The 2022 renewal of the *Lake Champlain Action Plan*
Strength in partnership

The Lake Champlain Basin has long been extremely important to Quebecers. Situated on both sides of our shared border, the Basin extends into Québec through the Rivière Richelieu and the St. Lawrence River basin. Along with our friends in Vermont and New York State, we benefit from the extensive natural resources and economic dynamism linked to this outstanding geographical asset.

With these shared benefits come shared responsibilities. It is our duty to protect and support this region that is world-renowned for its pristine beauty. The challenges are multiple, starting with the fight against climate change and the protection of biodiversity. Human security is also at the root of our concerns, especially in the wake of the significant flooding that has occurred in recent years.

Building upon longstanding and fruitful partnership, Québec, Vermont, and New York State are pursuing their commitments and renewing the action plan to restore and protect the waters and natural resources of Lake Champlain. *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin* is the fifth edition of the plan. Once again, it is serving as an especially inspiring model of sustainable development and integrated management of water resources.

The revision of the action plan has been carried out through the ongoing efforts of the Lake Champlain Basin Program Steering Committee, whose role is defined in the *Vermont–New York–Québec Environmental Cooperation Agreement on the Management of Lake Champlain,* which has bound the governments of Québec, Vermont, and New York State since 1988.

The objectives of the 2022 LCBP action plan have been established through on an even broader consultation of the interested stakeholders. The action plan takes into consideration the recommendations of individuals concerned with the restoration and protection of the basin's natural resources, while preserving the region's essential economic activities. The plan thus proposes initiatives that encourage the development of a prosperous, united, and engaged community on both sides of the border.

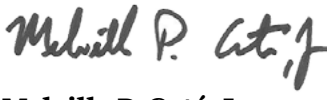
It is therefore with great enthusiasm that the Québec government thanks and congratulates the LCBP team and Steering Committee for their efforts and once again commits to participating very actively, along with its partners from Vermont and New York State, in the management of Lake Champlain and its basin for the benefit of current and future generations.

François Legault

The Lake Champlain Steering Committee members are pleased to recommend to the Governors of New York and Vermont and the Administrators of the U.S. Environmental Protection Agency these revisions of Opportunities for Action.

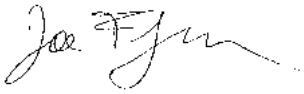
Richard Balla
US Environmental Protection Agency, Region 2

William Breck Bowden
Lake Champlain Sea Grant



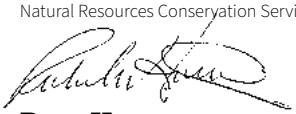
Melville P. Coté, Jr.
US Environmental Protection Agency, Region 1

Maya Dehner
US Army Corps of Engineers



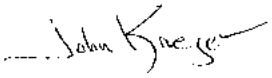
Joe Flynn
VT Agency of Transportation

Blake Glover
US Department of Agriculture
Natural Resources Conservation Service



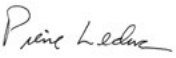
Buzz Hoerr
Chair, Education & Outreach Committee

Neil Kamman
Chair, Technical Advisory Committee



John Krueger
Chair, Heritage Area Partnership Committee

Louise Leblanc
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec



Pierre Leduc
Chair, Comité consultatif des citoyens du Québec

Daniel MacKay
New York State Office of Parks, Recreation & Historic Preservation

Christina Marts
National Park Service

Andrew Milliken
US Fish & Wildlife Service

Julie Moore
Vermont Agency of Natural Resources

Mark Naud
Chair, Vermont Citizens Advisory Committee

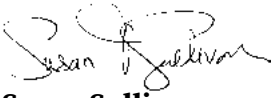
Jean-François Ouellet
Ministère des Fôrets, de la Faune et des Parcs

Nathalie Provost
Ministère de l'Environnement et de la Lutte contre les changements climatiques

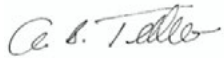
Victor Putman
Chair, New York Citizens Advisory Committee

Gilles Rioux
Mayor, Municipalité Stanbridge Station

Brian Steinmuller
New York State Department of Agriculture & Markets



Susan Sullivan
NEIWPCC



Anson Tebbetts
VT Agency of Agriculture, Food & Markets

Travis Thomason
US Department of Agriculture-
Natural Resources Conservation Service

Laura Treischmann
Vermont Agency of Commerce and Community Development

Steve Hunt
New York Empire State Development

Miro Weinberger
Mayor, City of Burlington

Joseph Zalewski
NYS Department of Environmental Conservation

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EXECUTIVE SUMMARY

While Lake Champlain remains a vibrant lake with many assets, several serious environmental problems demand action. High phosphorus levels, harmful algae blooms (HABs), toxic substances and pathogens, and aquatic invasive species continue to threaten the Lake ecosystem and reduce the human use and enjoyment of Lake Champlain. Natural resources are threatened by invasive species, wetland loss, habitat degradation and fragmentation, and diminished water quality. Other issues that face the Lake Champlain Basin include changes in hydrology, habitat and biodiversity, climate, impacts from continued land-use changes and habitat fragmentation, public access to the Lake, recreational user conflicts, and loss of cultural resources.

Improvements in wastewater management and sewage treatment (point sources) have greatly reduced the contamination of beaches and shorelines and continue to ensure that drinking water supplies in all parts of the Lake are safe. Partners continue to work together to address nutrient pollution from nonpoint sources that come from our interaction with urban, agricultural, and forested landscapes to Lake Champlain. Many challenges exist to protect the watershed's ecosystem functions so that it is best prepared to adapt to continuing climate change and the impacts of society.

Opportunities for Action 2022 identifies a suite of task areas to address these concerns that reflect a stakeholder prioritization effort for the restoration of Lake Champlain. The 2022 Plan outlines priority goals, objectives, and strategies for the LCBP to support over the next five years. Sound science is critical to these efforts, and it forms the basis of the work described in this Plan. Long-term monitoring of the Lake Champlain ecosystem's health is the foundation of this scientific approach and is critical for conducting research and measuring the success of the Plan.

The achievement of numeric phosphorus load reductions (TMDLs) to achieve in-lake concentration standards are established as jurisdictional obligations in Vermont and New York. The LCBP authorization provides an important role for the LCBP to support the goals of the States to meet the numeric standards identified in the phosphorus TMDLs for Lake Champlain and to facilitate collaboration among the many agencies responsible for meeting their common goals.

The current Opportunities for Action plan was approved in 2017. In that time, the LCBP has awarded over 500 grants and contracts, summing to more than $13 million to for-profit, not-for-profit, municipal and academic institutions across the Basin to accomplish the goals of the 2017 OFA plan. New projects installed best management practices, conducted surveys and assessments, and supported engineered designs to reduce pollutant loading into Lake Champlain. Research projects helped to inform management decisions at the local and regional scales. More than 300,000 people were reached in outreach work across the spectrum of the Plan, to help individuals take measures to reduce their impact on nutrient loading, prevent the spread of invasive species, learn about the culture and heritage of the region, and more. Over $22 million was dedicated to implementation of the 2016 TMDLs in Vermont to reduce phosphorus loading.

Significant U.S. Federal resources will be directed to the LCBP through the 2021 Bipartisan Infrastructure Law (BIL) during the timeframe of the 2022 OFA plan. In recognition of the goals of BIL, the 2022 plan includes a renewed focus on projects and programs that address and mitigate impacts of climate change, including forecasted temperate changes, rainfall, and flooding. The Plan also includes new actions that will engage underserved communities to increase the role of these groups in restoring and protecting Lake Champlain. Tasks that mitigate climate change impacts, and engage underserved communities are woven into elements throughout the Plan.

The four action goals of OFA are Clean Water, Healthy Ecosystems, Thriving Communities, and Informed and Involved Public. A summary of each is provided below.

CLEAN WATER

Work in this goal will use knowledge from scientific research to inform resource management decisions and projects to address nutrient and contaminant concerns in the Lake Champlain Basin, including changing climate impacts to the Lake. Objectives in this goal will support work to improve understanding of water quality conditions and trends to inform management decisions, support work to reduce contaminants and pathogens, to reduce nutrient loading, and to support research to understand and adapt to the impact of climate change on clean water. Research programs will support monitoring programs and management-oriented research and help interpret research to inform management decisions. Nutrient reduction work will address all land use sectors – agriculture, streambanks, urban, and forested lands. Clean water work also will implement recommendations from the bi-national Missisquoi Bay phosphorus reduction task force, coordinated by the LCBP.

HEALTHY ECOSYSTEMS

This goal addresses Lake Champlain ecosystem concerns, through restoration and protection of habitat that is critical to native species, biodiversity, and ecosystem func-

tions. Objectives in this goal focus on climate change, with a focus on research toward mitigation of climate impacts of increasing temperatures in the tributary network and reducing flooding in the Basin; assessment of ecosystem management programs and policies; research of, and conservation of habitat for, ecosystem function; protection and preservation of biodiversity; and reducing the prevalence of aquatic invasive species in Lake Champlain.

THRIVING COMMUNITIES

This goal engages with the people of the Basin at the community level – targeting access points of community members to points of interest across the spectrum of different stakeholder groups. The LCBP utilizes the mission of the Champlain Valley National Heritage Partnership to interpret the rich cultural history of the Champlain Valley to engage stakeholders in conversations and learning opportunities and make connections to the water quality and health of the Basin. Objectives for this goal address engagement and support for communities, support water-wise economic development, support awareness and conservation of cultural heritage resources, and to support recreation across the Basin. Work in this goal has been organized to expand engagement with traditionally underserved communities, including low-income communities, to improve and expand access to Lake Champlain resources for these groups. Flood resilience at the community level is also emphasized in this goal.

INFORMED & INVOLVED PUBLIC

Work in this goal is oriented around three objectives: formal learning programs, informal learning programs, and facilitating behavior change in individuals. Through these three objectives, the LCBP will support staff-driven programs and issue awards to encourage public engagement and understanding of Lake Champlain Basin resource concerns. New programs to support outreach work to traditionally underserved communities are highlighted in this goal. Strategies to accomplish these objectives will include work such as communicating watershed science about the Basin in classrooms and in public forums, maintaining digital tools and resources about the Basin, supporting youth learning and engagement programs, and promoting actions people can take at the individual, family, or community-level to help achieve our goals for Lake Champlain.

RESPONSE METRICS

OFA is intended to be a plan that drives management responses to resource pressures that affect the state of Lake Champlain. In this Plan, the LCBP will track a suite of response metrics associated with strategies within each of the four goals. Response metrics across the four goals will include recording of the number of grants and funds awarded per goal, and topic areas addressed with those funds. Quantities of phosphorus retained on the landscape, or prevented from reaching Lake Champlain or its tributary network, also will be reported annually and in sum at the completion of this 5-year Plan. Additional metrics will track work toward improvement of the Lake Champlain ecosystem, including acres of habitat restored or protected, the number of people reached about aquatic invasive species, number of communities engaged, people receiving professional trainings, educational programs offered, students engaged, and stakeholders reached through outreach programs across the Basin through grant programs and by LCBP staff.

INTRODUCTION

BACKGROUND

Lake Champlain Basin

The Lake Champlain Basin, stretching from the peaks of the Adirondacks to the Green Mountains and north into Québec, is renowned as one of North America's most beautiful and valued resources. Residents and visitors alike enjoy Lake Champlain for swimming, drinking, fishing, and recreation. At 120 miles (193 km) long and more than 400 feet (122 m) deep, the Lake supports a complex freshwater ecosystem with diverse plant and animal species. The biological riches of the Basin, unparalleled beauty of the mountains, historic resources, agricultural landscapes, small towns and villages, and rivers that flow into the magnificent Lake provide experiences and opportunities unique to the region. Although the benefits of healthy resources are difficult to quantify, well-functioning ecosystems support a rich economy for fishing, swimming, agriculture, and forestry.

While Lake Champlain remains a vibrant lake with many assets, several serious environmental problems demand action. High phosphorus levels, harmful algae blooms (HABs), toxic substances and pathogens, and aquatic invasive species continue to threaten the Lake ecosystem and inhibit the human use and enjoyment of Lake Champlain. Natural resources, such as fish, wildlife, and plants, are threatened by invasive species, wetland loss, habitat degradation and fragmentation, and diminished water quality. Other issues that face the Lake Champlain Basin include changes in hydrology, habitat and biodiversity, climate, impacts from continued land-use changes and habitat fragmentation, public access to the Lake, recreational user conflicts, and loss of cultural resources.

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THE LAKE CHAMPLAIN SPECIAL DESIGNATION ACT

On November 5, 1990, the *Lake Champlain Special Designation Act* was signed into law [http://www.lcbp.org/appenda.pdf]. Sponsored by Senators Leahy and Jeffords from Vermont and Senators Moynihan and D'Amato from New York, this legislation designated Lake Champlain as a resource of national significance. The goal of the Act was to bring together people with diverse interests to create a comprehensive plan for protecting the future of Lake Champlain and its surrounding watershed. The Act specifically required examination of water quality, fisheries, wetlands, wildlife, recreational, and cultural resource issues. The challenge had been both to identify problems requiring management action and to chart an integrated plan for the future of the Lake Champlain Basin. The Special Designation Act created the Lake Champlain Basin Program (LCBP), a non-regulatory partnership among the States of New York and Vermont, the Province of Québec, the U.S. Environmental Protection Agency (USEPA), other federal and local government agencies, and many public and private local groups.

THE LAKE CHAMPLAIN BASIN PROGRAM

Mission

The LCBP coordinates and funds efforts to benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources, in partnership with government agencies from New York, Vermont,

Partnerships are the foundation of the LCBP's work. The signing of the 2017 Opportunities for Action brought many of these partners together at Crown Point for the signing ceremony. Photo: LCBP

and Québec, private organizations, local communities, and individuals.

The LCBP maintains inclusive partnerships that empower diverse communities to take action toward improving and protecting the natural resources and the cultural heritage of the Lake Champlain Basin.

The LCBP envisions rich natural resources and cultural heritage of the Lake Champlain Basin that are stewarded by a diverse, inclusive, informed, and engaged community working together for the common good of Lake Champlain for current and future generations.

Lake Champlain is an enormous resource requiring special care and stewardship.This comprehensive management plan, *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin (OFA),* is a coordinated effort to inform, guide, and assist essential stewardship efforts for the watershed.

Role and Structure

As a partnership of provincial, state, and U.S. federal agencies, the LCBP brings cross-boundary and multidisciplinary leadership experience to coordinating and implementing OFA. The LCBP works cooperatively with many partners to protect and enhance the environmental integrity and the social and economic benefits of the Lake Champlain Basin. The LCBP is administered jointly by several agencies: U.S. Environmental Protection Agency (Regions 1 and 2), New York State Department of Environmental Conservation, Vermont Agency of Natural Resources, Québec Ministry of Environment and the Fight against Climate Change, and NEIWPCC.

Lake Champlain Steering Committee membership from New York, Québec, and Vermont reflects each jurisdiction's commitment to the 2015 *Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain among The State of New York, The State of Vermont and the Government of Québec* (Appendix V). It is this MOU that also describes the role, goals, and eligible membership of the Lake Champlain Steering Committee (Appendix IV) and will be updated in 2022. U.S. federal agency participation in the Lake Champlain Steering Committee, codified in OFA, reflects the federal commitments established in the *Special Designation Act of 1990* and the *Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002,* which have enabled substantial U.S. federal funds to be appropriated to support the work of the LCBP. These funds are made available to the LCBP to support operations and tasks that are consistent with the federal authorizations. See Appendix I for more information about the LCBP Operating Structure, Committees (including Committee representation), and Staffing.

Funding for the LCBP

The Lake Champlain Basin Program historically has been appropriated funding by the U.S. government through the Environmental Protection Agency. More recently, the LCBP also has been supported with appropriations from the Great Lakes Fishery Commission and the National Park Service. The LCBP also occasionally receives awards from other government entities, such as the International Joint Commission to conduct specific projects. During the past two decades, the LCBP has sponsored a great variety of programs supported by these different sources of funding, including research, monitoring, and grants to regional organizations to promote water quality programs and install projects to improve water quality. As of Federal Fiscal Year 2021, nearly $105 million had been appropriated to support the general priorities identified in OFA. The LCBP has provided more than $20 million to support over 1,600 grants awarded to more than 600 local recipients to reduce pollution in the Lake, educate and involve the public, and gather and share information about Lake issues. The LCBP also has funded education, planning, demonstration, control, research, and monitoring projects to restore and protect water quality and the diverse natural and cultural resources of the Lake Champlain Basin. In FFY18, funding dedicated to the implementation of the 2016 phosphorus TMDLs for Lake Champlain was established; as of FFY21, nearly $23 million in EPA-LCBP Section 120 funds have supported this specific initiative, in addition to the $105 million noted above.

Infrastructure Investment and Jobs Act of 2021 (Bipartisan Infrastructure Law)

The Bipartisan Infrastructure Law of 2021 is intended to be a once-in-a-generation investment in the infrastructure and communities of the United States. This bill created an opportunity to expand access to clean drinking water; to tackle the climate crisis and advance environmental justice, while investing in communities—both urban and rural—that have too often been left behind. The bill also emphasizes the importance of directing funds toward traditionally underserved communities. This bill identified $40 million to support the Lake Champlain Basin Program, to prioritize projects that addre ss ecosystem and wetland restoration, stormwater treatment and control, nature-based infrastructure, community resilience, resilient shorelines, and environmental education. The LCBP will receive up to $8 million per year to address these priorities for Federal Fiscal Years 2022-2027, coincidental with the timeframe of this new OFA management plan.

Environmental Protection Agency

The Lake Champlain Special Designation Act (Section 120 of the Clean Water Act) was reauthorized in 2002 with the *Daniel Patrick Moynihan Lake Champlain Basin Program Act,* authorizing expenditures of up to $11 million per year to accomplish this goal [https://www.lcbp.org/wp-content/uploads/2012/08/H.R.1070_LCBPAuthorization_2002.pdf]. Annual appropriations through the EPA have averaged over $10 million since 2017. This money supports numerous LCBP programs and Lake Champlain Steering Committee priorities each fiscal year, with particular focus on supporting efforts to reduce phosphorus pollution to the Lake and to reduce the occurrence of harmful algal blooms.

Great Lakes Fishery Commission

In addition to the funding appropriated to the LCBP through Section 120 of the Clean Water Act, the LCBP also receives support from the Great Lakes Fishery Commission (GLFC). The GLFC was established by the 1954 Convention on Great Lakes Fisheries to encourage cross-border collaborative management efforts to restore the fisheries of the Great Lakes, particularly for management of sea lamprey. The recognition of sea lamprey as a nuisance species in Lake Champlain opened an avenue for funding through the GLFC to support fisheries and water quality restoration work in Lake Champlain. The GLFC, the LCBP, and the U.S. Fish & Wildlife Service (USFWS) entered into a Memorandum of Understanding (MOU) on Native Species and Habitat Restoration and Water Quality Improvements in 2010. Up to $9 million has been recently appropriated via the GLFC toward Lake Champlain work annually, a reflection of Senator Leahy's commitment to improving the Lake Champlain ecosystem. Of this annual appropriation, approximately $0.6 – $2 million has been available annually to the LCBP to support watershed restoration work in Lake Champlain, with the balance directed toward sea lamprey management, fisheries research, and other habitat restoration work conducted by the U.S. Fish and Wildlife Service and researchers at the University of Vermont.

National Park Service: Champlain Valley National Heritage Partnership

The Champlain Valley National Heritage Partnership (CVNHP) was established in 2006 as a part of the National Heritage Area (NHA) programs to recognize the importance of the historical, cultural, and recreational resources of the region and to assist efforts to preserve, protect, and interpret those resources. The Lake Champlain Basin Program (LCBP) is the managing entity of the CVNHP. The LCBP coordinates its work with its official liaison to the National Park Service (NPS), the Marsh-Billings-Rockefeller National Historical Park (MBRNHP) located in Woodstock, Vermont. The purpose of the NHA also is to enhance the quality of the tourism economy and to encourage working partnerships among state, provincial, and local governments and nonprofit organizations in New York, Québec, and Vermont. As a NHA with an approved management plan, the CVNHP is authorized to receive up to $1 million annually and has recently been appropriated up to $400,000 from the National Park Service (NPS). These funds are allocated annually from the U.S. Department of Interior budget, which is determined by the U.S. Congress.

ADDRESSING THE ISSUES: *OPPORTUNITIES FOR ACTION*

Opportunities for Action is a plan developed for managing the Lake Champlain watershed. To that end, it is designed as a tool for the Lake Champlain Steering Committee. Section 120 of the Clean Water Act mandates that the Lake Champlain management plan is required to be updated at least every five years, and the priorities contained within the Plan characterize the eligibility of projects and programs to be supported with resources directed to Lake Champlain through Section 120 each federal fiscal cycle. This resource is to be used as a strategic planning guide, to inform management decisions over the next several years. New in 2022, the Lake Champlain Steering Committee also will develop a guide to map out annual budget priorities using the Objectives and Strategies identified in the Plan, through an OFA Implementation Plan. This Implementation Plan will be developed following approval of *Opportunities for Action.*

The broader community of governments, organizations, watershed groups, academic institutions, and other lake user groups can use OFA to follow the priorities of the Lake Champlain Steering Committee, to use as a guide for targeting their own programs, and to identify priorities within their own specific management plans that align with those of the Lake Champlain Steering Committee. The Lake Champlain Steering Committee is a board comprised of a broad spectrum of representatives of government agencies and the chairpersons of advisory groups representing citizen lake users, scientists, and educators. The Lake Champlain Steering Committee approves the guiding priorities identified in this Plan and authorizes the use of appropriated funds to achieve these priorities. For more information about the Lake Champlain Steering Committee, please refer to the "Lake Champlain Basin Program Role and Structure" section of the Plan.

All stakeholders within the Lake Champlain watershed wish to have a clean lake. Interpretations of "clean" may vary, but people generally want a lake that is suitable for recreation, provides a clean source of drinking water that is safe and reliable, and contains fish that are safe to eat. The stakeholders of the Lake Champlain watershed are not unique in this regard, and neither are the management issues that need to be addressed. Harmful algal blooms are a global issue, as are toxin levels within sportfish, conservation of threatened and vulnerable species, and the impacts of climate change. Invasive species can drastically alter lake ecosystems, often to the detriment of recreation and the economy, and occasionally public health. Changes in climate patterns affect the lake ecosystem, reducing ice cover and lengthening the biologically productive season of the Lake. This increases the prevalence of cyanobacteria blooms, improves conditions for some species, and reduces the quality of the ecosystem for others. The broader themes of this Plan address some of these "aspirational goals" by reducing the frequency and toxicity of harmful algal blooms, reducing the impact of invasive species and eliminating pathways for new invasions, and restoring native species, such as lake trout and Atlantic salmon.

Opportunities for Action 2022 identifies a suite of task areas to address these concerns. These are largely built from the task areas identified in the 2017 plan, but also reflect a prioritization effort held in June 2021 in which stakeholders engaged in LCBP committees worked together to identify high priority task areas for the 2022 plan. The

2022 plan outlines priority goals, objectives, and strategies for the LCBP. Sound science is critical to these efforts, and it forms the basis of the work described in this Plan. Long-term monitoring of the Lake Champlain ecosystem's health is the foundation of this scientific approach and is critical for conducting research and measuring the successes or weaknesses of the Plan.

The jurisdictions governing the Lake Champlain Basin—the governments of Québec, New York, Vermont, and U.S. federal agencies—have specific statutory requirements to establish and to achieve water quality standards. They also can raise revenue and enforce laws that accomplish these responsibilities. For example, the achievement of numeric phosphorus load reductions (TMDLs) to achieve in-lake concentration standards are established as jurisdictional obligations in Vermont and New York. The LCBP's congressional authorizations provide a mechanism for the LCBP to serve an important role in supporting the goals of the States to meet the numeric standards identified in the phosphorus TMDLs for Lake Champlain and to facilitate collaboration among the many agencies responsible for meeting common goals. Several inter-jurisdictional agreements advancing the stewardship of the Lake Champlain watershed have been facilitated by the LCBP, resulting in a robust culture of cross-boundary collaboration.

As the latest revision of this restoration plan has developed, particular care has been taken to acknowledge and support, but not to duplicate, the actions detailed in other existing management plans, such as the *Phosphorus TMDLs for Vermont Segments of Lake Champlain (2016),* the V*ermont Lake Champlain Phosphorus TMDL Phase I Implementation Plan (2016),* the *Lake Champlain Basin Rapid Response Action Plan for Aquatic Invasive Species (2009),* and other important stand-alone planning documents.

Sound science and targeted management efforts alone will not achieve these broad aspirational goals. The resources available to achieve these goals are limited. A clean lake and healthy watershed will require more than what the LCBP and its partners can bring to the table. Broad changes in the way society relates to the Lake—as communities, as businesses, and as individuals working and living within the Lake Champlain watershed—will be required. Fundamental shifts in the way we think each day about the water that runs off our rooftops, driveways, lawns, fields, and our forests, where that runoff goes, and what it carries with it will be critical if we are to achieve these aspirational goals in the long-term. If we each take actions to reduce our contribution to runoff and nutrient pollution, we can work collectively toward a healthy and resilient lake ecosystem. We need to consider how our educational system teaches students about their individual and collective impacts on the Lake, with emphasis on water conservation, quality, and management through individual actions. As a culture, we must think carefully about how we prioritize and fund programs that benefit the Lake, and how these programs can be sustained.

For this reason, Plan implementation must involve the public and build local support through nongovernmental organizations and municipalities. Implementation must also be paired with efforts to educate the public, elected officials, and interest groups about the science behind Lake issues to ensure these groups are informed during policy development and funding decision processes.

Many cooperating agencies, organizations, and individuals have contributed their time and expertise to producing a comprehensive pollution prevention, control, and restoration plan that efficiently guides the allocation of LCBP resources. The Lake Champlain Steering Committee strives to allocate funds annually to support high priority tasks of Basin-wide importance:

- long-term monitoring of water resources
- local plan implementation and educational program grants
- direct pollution prevention projects
- targeted environmental research
- interpretation & presentation of objective science to inform resource managers, the public, and policy makers
- numerous educational programs including substantial LCBP website resources and operation of the LCBP Resource Room at ECHO, Leahy Center for Lake Champlain
- operational assistance to watershed organizations
- heritage and recreational programs consistent with the goals of the Champlain Valley National Heritage Partnership Management Plan

RELEVER LES ENJEUX : PERSPECTIVES D'ACTION

Perspectives d'action est un plan élaboré pour la gestion intégrée du bassin hydrographique du lac Champlain. À cet effet, le plan est conçu comme un outil de gestion pour le Comité directeur du lac Champlain. La Section 120 du Clean Water Act (Loi sur la qualité de l'eau) exige que le plan de gestion du lac Champlain soit mis à jour au minimum tous les cinq ans et que les priorités établies dans le cadre du plan caractérisent les conditions d'admissibilité des projets et des programmes soutenus par les ressources accordées au lac Champlain en vertu de la Section 120 à chaque cycle fiscal fédéral. Ce plan doit être utilisé comme un guide de planification stratégique et une source d'information pour les orientations de gestion du comité pour les années à venir. Une nouveauté en 2022, le Comité directeur du lac Champlain élaborera également un guide pour l'établissement des priorités budgétaires annuelles s'appuyant sur les objectifs et stratégies définis dans le Plan, sous la forme d'un plan de mise en œuvre de *Perspectives d'action (PDA).* Ce plan de mise en œuvre sera élaboré suite à l'approbation de *PDA*.

L'ensemble des représentants des divers paliers gouvernementaux, des organisations de bassins versants, des universités et d'autres groupes peut aussi utiliser PDA pour suivre les priorités du Comité directeur du lac Champlain et comme référence pour identifier leurs priorités d'interventions afin qu'elles s'harmonisent avec celles du Comité

directeur du lac Champlain. Le Comité directeur du lac Champlain est un conseil réunissant un large éventail de représentants d'instances gouvernementales et les présidents de groupes consultatifs qui représentent des citoyens utilisateurs du lac, des chercheurs et des éducateurs. Le Comité directeur du lac Champlain approuve les priorités générales identifiées dans ce plan et autorise l'utilisation de fonds appropriés en vue de réaliser ces priorités. Pour plus de renseignements sur le Comité directeur du lac Champlain, veuillez vous reporter à la section « Lake Champlain Basin Program Role and Structure » (Rôle et structure du Programme de mise en valeur du lac Champlain).

Tous les intervenants et les citoyens du bassin versant du lac Champlain souhaitent avoir un lac avec de l'eau propre. L'interprétation de « propre » peut varier, mais dans l'ensemble les gens veulent avoir un lac qui est non pollué pour fournir une source d'eau potable sécuritaire et fiable, pour avoir des poissons non contaminés et pour leurs loisirs. Les citoyens du bassin versant du lac Champlain ne sont pas uniques à cet égard, pas plus que les problèmes de gestion qui doivent être abordés. La prolifération de cyanobactéries est une problématique mondiale, tout comme les niveaux de toxines dans les poissons de pêche récréative, la protection des espèces menacées et vulnérables et les effets du changement climatique. Les espèces envahissantes altèrent gravement les écosystèmes lacustres souvent au détriment des loisirs, de l'économie et parfois même de la santé publique. Les changements climatiques affectent l'écosystème du lac en réduisant la couverture de glace et en prolongeant la période de productivité biologique du lac. Les conséquences sont notamment une prévalence accrue des proliférations de cyanobactéries et des conditions plus favorables pour certaines espèces au détriment d'autres espèces. Les thèmes généraux de ce plan visent certains de ces « objectifs ambitieux », notamment la réduction de la fréquence et de la toxicité des efflorescences d'algues nuisibles, la réduction de l'impact des espèces exotiques envahissantes en éliminant leurs voies de migration et la restauration des espèces indigènes comme le touladi et le saumon atlantique.

Perspectives d'action 2022 identifie une série de tâches pour répondre à ces préoccupations. Celles-ci découlent en grande partie des domaines d'action définis dans le plan de 2017, mais reflètent également les conclusions d'un groupe de travail réuni en juin 2021 où des membres de comités du LCBP se sont attachés à identifier des tâches prioritaires pour le plan 2022. Le plan 2022 décrit les buts, objectifs et stratégies prioritaires pour le LCBP. Un fondement scientifique est essentiel à ces efforts et constitue la base du travail décrit dans ce plan. Le suivi à long terme de la santé de l'écosystème du lac Champlain est le fondement de cette approche scientifique et est essentiel pour mener des recherches et mesurer les succès ou les faiblesses du plan.

Les juridictions du bassin du lac Champlain—les gouvernements du Québec, de New York et du Vermont et les organismes fédéraux américains—ont des exigences légales spécifiques pour établir et atteindre les normes de qualité de l'eau. Elles peuvent également générer les revenus et veiller à l'application des lois à cet effet. Par exemple, la réalisation des objectifs de réduction des charges de phosphore pour satisfaire les normes de concentration dans le lac est définie comme étant une obligation juridique au Vermont et à New York. Le Congrès Américain a habilité le LCBP à assumer un rôle d'important de soutien des États dans la réalisation des objectifs quantitatifs de charge quotidienne maximale totale (TMDL) de phosphore dans le lac Champlain et d'assistance pour faciliter la collaboration entre les nombreux organismes partageant des buts communs. Le LCBP a facilité la signature de plusieurs accords multipartites sur la gestion du bassin versant du lac Champlain, résultant en une solide culture de collaboration transfrontalière.

L'élaboration de cette nouvelle version du plan de réhabilitation a accordé un soin particulier à reconnaître et à soutenir, mais sans les répéter, les mesures détaillées dans d'autres plans de gestion existants, tels que *Phosphorus TMDLs for Vermont Segments of Lake Champlain (2016), Vermont Lake Champlain Phosphorus TMDL Phase I Implementation Plan (2016), Lake Champlain Basin Rapid Response Action Plan for Aquatic Invasive Species (2009),* et d'autres documents de planification stratégique.

Une approche scientifique solide et des efforts de gestion ciblés seuls ne permettront pas d'atteindre ces grands objectifs ambitieux dans un contexte de ressources limitées. L'atteinte de ces objectifs nécessitera des efforts au-delà de la contribution que peuvent apporter le LCBP et ses partenaires. Elle nécessitera d'importants changements sociétaux notamment dans la manière dont nous pensons et agissons en tant que collectivités, entreprises et personnes qui œuvrent et vivent dans le bassin versant du lac Champlain. La façon dont nous agissons et pensons quotidiennement à l'eau qui ruisselle de nos toits, nos allées, nos pelouses, nos champs et nos forêts sera critique si nous voulons atteindre ces objectifs ambitieux à long terme. Si chaque citoyen du bassin versant peut faire un geste pour réduire la pollution, cela permettra d'améliorer collectivement la qualité de l'eau et l'écosystème du lac Champlain. Nous devons aussi revoir la façon dont notre système d'enseignement sensibilise aux questions d'impacts individuels et collectifs sur le lac en mettant l'accent sur la conservation, la qualité et la gestion de l'eau par des actions individuelles. En tant que culture, nous devons réfléchir attentivement à la façon dont nous privilégions et finançons les programmes qui profitent au lac et la façon dont ces programmes peuvent être soutenus.

Pour cette raison, la mise en œuvre du plan doit impliquer le public et créer un soutien local par le biais d'organisations non gouvernementales et de municipalités. La mise en œuvre doit également fournir un moyen d'éduquer le public, les élus et les groupes d'intérêt sur une base scientifique afin de s'assurer que ces groupes sont correctement informés lors de l'élaboration des politiques et des processus de décision de financement.

De nombreuses personnes, organisations et agences ont contribué de leur temps et leur expertise à produire un plan complet de prévention, de contrôle de la pollution et de restauration qui oriente efficacement l'allocation des ressources du LCBP. Le Comité directeur du lac Champlain s'efforce d'allouer des fonds chaque année pour soutenir les actions très prioritaires et importantes pour l'ensemble du bassin du lac Champlain :

- suivi à long terme de la qualité de l'eau
- mise en œuvre du plan et subventions aux programmes éducatifs avec les intervenants locaux
- projets de prévention directe de la pollution
- recherche ciblée sur l'environnement
- interprétation et utilisation de données scientifiques objectives pour informer les gestionnaires des ressources, le public et les responsables politiques
- nombreux programmes éducatifs, notamment d'importantes ressources sur le site du LCBP et le fonctionnement de la salle de ressources du LCBP au ECHO Leahy Center for the Lake Champlain
- soutien opérationnel aux organismes de bassins versant
- programmes patrimoniaux et récréatifs conformes aux objectifs du Plan de gestion du patrimoine national de la vallée de Champlain

ACCOMPLISHMENTS SINCE 2017

The LCBP and the CVNHP have awarded over $13 million to more than 500 grants and contracts since the plan was last updated in 2017. Many of these grants were augmented by non-federal matching funds or other federally funded programs (Appendix II).

Clean Water

The LCBP awarded 138 projects, summing to over $7.7 million, to address priorities in the Clean Water goal between 2017-2021. These projects conducted research, monitoring, and assessments and designed and installed water quality improvement projects across the Basin. Notably, over 200 conservation practices were implemented across 150 farms in the Basin and 50 acres of wetlands were restored or conserved. Over 130 acres of shoreland and riparian habitat were planted or managed, including management of terrestrial invasive species that would inhibit growth of planted trees. Over $1 million was dedicated to research to inform management decisions about stormwater, to understand innovative phosphorus reduction and treatment approaches, and to map impervious surface area. Another $1.6 million supported monitoring programs, including cyanobacteria monitoring, tributary flow monitoring, and meteorological monitoring programs. Over $1.5 million supported stormwater master planning, and the installation of more than 50 stormwater BMPs to keep over 75,000 pounds annually of sediment out of Lake Champlain and its tributary system. Over $500,000 supported three dam removals, and culvert assessments and replacements, reconnecting 30 miles of stream networks for fish passage.

In addition to managing the 138 projects noted above, LCBP staff completed the report *Nutrient Loading and Impacts in Lake Champlain, Missisquoi Bay, and the Richelieu River* as part of the International Joint Commission's Missisquoi Bay Water Quality project in partnership with Organisme de basin versant de la baie Missisquoi (OBVBM). Staff also supported the International Joint Commission's Lake Champlain-Richelieu River Study Board analysis of flooding causes, impacts, risks, and solutions. The final report for this study will be published in 2022. LCBP staff coordinated the planning and hosting of the Lake Champlain Research Conference, which brought together more than 200 stakeholders for interdisciplinary sessions on lake science and management. Agronomists in New York and Vermont assisted farmers in implementing best management practices to reduce erosion and export of nutrients from farmland. Staff conducted analyses and produced a Lake Champlain tributary loading report which examines trends in pollutant delivery from the Lake's major tributaries since 1990.

An additional $22.4 million was appropriated between Federal Fiscal Years 2018 and 2021 for the implementation of the Vermont 2016 TMDL for phosphorus reduction in Lake Champlain. These funds have largely been directed to the State of Vermont to support grant programs for implementation of agricultural BMPs, acquisition and conservation of critical wetlands, and addressing stormwater problems in public schools across the Vermont portion of the Lake Champlain Basin. Targeted programs also will reduce nutrient loading to the Lake as a result of municipal stormwater assessments, reducing nutrient loading into Lake Carmi, reducing runoff from non-municipal roads, and supporting forestry accepted management practices.

Healthy Ecosystems

LCBP staff managed over 60 projects summing to over $800,000 that were awarded to address aquatic invasive species (AIS) concerns across the Lake Champlain Basin. These projects provided trainings to watershed groups, inspected more than 65,675 watercraft at boat launches on waterbodies across the Basin, removed more than 2,100 AIS from boats, and fully decontaminated over 630 watercraft. Twenty new decontamination stations for boats and angling gear were installed at public access points on lakes and rivers. Projects mapped new and existing AIS infestations, removed thousands of invasive plants from Lake Champlain and inland waterways, supported biological and mechanical management of invasive plants, and assessed nearly 50 lakes and ponds for AIS.

Separately, nearly $1 million supported more than 40 LCBP boat launch stewards, who inspected nearly 140,000 watercraft from 49 U.S. states and Canadian provinces at public access points on Lake Champlain. These inspections identified and removed 3,183 AIS from watercraft and trailers, preventing them from being introduced into Lake Champlain or from being trailered to other waterbodies in the region. These funds also supported the

purchase and maintenance of two high pressure, hot water decontamination stations that are operated at high traffic public launches on the lake.

LCBP staff spent significant time working with the U.S. Army Corps of Engineers (USACE) on a study to determine options for an AIS barrier on the Champlain Canal. A Phase 1 study was initiated in 2017, with $200,000 in local sponsor funds provided to the USACE. The report for that study will be completed in 2022. Staff also helped to coordinate meetings between stakeholders and the USACE to identify projects eligible for support through the USACE Water Resources Development Act (WRDA) Section 542 authorization for watershed improvement projects. Staff led multi-state, bi-national, multi-agency efforts to discuss approaches to preventing new invasions of aquatic species, including hydrilla and round goby. Staff also participated in and coordinated Vermont and New York Dam Task Forces, respectively, to bring together stakeholders to identify and prioritize removal of dams that no longer serve a useful purpose and to improve aquatic organism passage.

Thriving Communities

Over $500,000 in projects were awarded to groups across the Champlain Valley National Heritage Partnership area to support interpretation of the culture and history of the region. CVNHP supported 24 projects focused on the three interpretive themes: Making of Nations, Corridor of Commerce, and Conservation & Community. An additional seven Special Program projects were larger-scale awards that supported these interpretive themes. Nineteen heritage projects helped students learn about local history, 16 collections projects helped museums protect, conserve, inventory, and display artifacts and interpretive exhibits. The CVNHP also supported workforce development in this sector through six internship grants, in which students or new professionals to the culture and recreation field worked in museums and earned hands-on learning experiences for their resumes.

The LCBP and CVNHP staff also developed, designed, produced, and installed 66 new and refurbished six interpretive wayside exhibits across the CVNHP area. Staff produced a guide to the Revolutionary War in the Champlain Valley, celebrated and interpreted the International Year of the Salmon, and commemorated the centennial of the 19th Amendment, which gave women the right to vote. Staff built and maintained partnerships across the region, coordinating and engaging in meetings and conversations to move new ideas forward in the CVNHP.

The LCBP continued to support watershed groups with missions centered on achieving water quality improvements in the Lake Champlain watershed with 55 projects, summing to more than $185,000. When the COVID-19 pandemic arrived in March 2020, the watershed groups of the Lake Champlain Basin faced significant fiscal uncertainty. Recognizing the invaluable work that these groups do for Lake Champlain, the Lake Champlain Steering Committee re-prioritized some available funds to support 14 one-time COVID Emergency support grants to help watershed groups transition to virtual platforms and programming during the early days of the work-from-home period.

Informed and Involved Public

The LCBP supported more than 95 projects totaling nearly $1,000,000 that focused on public education and outreach. These projects worked to build school outreach programs, summer youth programs, and community development. The COVID pandemic of 2020-2021 reduced in-person engagements, but the LCBP and partners quickly pivoted programs to virtual platforms to continue working with interested members of the public. Nearly 25 educational events were supported with grant awards, reaching 225 students interested in learning more about Lake Champlain issues, and summer youth programs connected with over 175 additional people. New projects supported 20 workshops and community events, and five new exhibits were produced. Local organizations created more than 40 short videos, addressing a broad spectrum of water quality and watershed management topics.

LCBP staff in the Resource Room at ECHO, Leahy Center for Lake Champlain engaged with 115,000 visitors between 2017 and 2021. The COVID pandemic significantly reduced visitation to this facility and the LCBP's ability to deliver in-person programming during this time. The LCBP website was redesigned in 2020, providing updated and new content to visitors. The new website receives more than 160,000 hits annually, and more people visit six additional websites maintained by the LCBP. LCBP social media accounts average more than 4,000 unique user views per month. The Lake Champlain Basin Atlas was updated in 2018, and is now a resource accessed by teachers, researchers, and resource managers for maps and quick-reference information about the Basin. LCBP staff delivered over 325 programs to schools, community groups, and on field trips, sharing information about watersheds and wetlands. The LCBP published the State of the Lake report in 2018 and 2021, summarizing data around key indicators of the health of the Lake Champlain Basin.

KEY FUNCTIONS OF *OPPORTUNITIES FOR ACTION*

Coordinate Programs and Implementation Activities

Coordination of the work conducted in multiple political jurisdictions by numerous federal and state resource agencies, regional and local governments, private-sector stakeholders, nonprofit organizations, residents, and visitors is critical to effective management of the Lake Champlain Basin. By coordinating management efforts and the dispersal of resources and facilitating dialogue and the exchange of data and information, the LCBP helps to ensure efficient management that reduces redundancy among partners.

Support Local Level Implementation and Involve the Public

On-the-ground work conducted at the local level by watershed groups, lake associations, conservation districts, and

educational institutions is the cornerstone of a successful restoration effort. Local residents who are most directly affected by an issue are often motivated to address the issue. Many communities have existing resources and organizations to help implement programs, but may lack technical expertise, adequate funding, or access to additional human and financial resources. Building local capacity for plan implementation requires strengthening technical assistance to community groups and may require additional financial support for local programs.

A public that understands the Basin's water quality and resource management issues can make informed choices about the long-term protection and restoration of the Lake. For this reason, public information and outreach efforts have been a core function of the LCBP's work since its establishment. Informing the public about how to change personal and collective behaviors and providing opportunities to change those behaviors are critical steps in reducing our impact on Lake Champlain. Furthermore, involving the public in planning and implementation increases both the sphere of responsibility for action and support for recommended policy actions.

Measure and Monitor Success Relative to Benchmarks

Monitoring progress toward established goals is a critical component of watershed management. Tracking of this kind hinges on the availability of reliable data that informs key ecosystem indicators of watershed health. Evaluation of trends related to these indicators leads to the adjustment of management actions and funding priorities. In this way, monitoring ensures accountability to the public. The *State of the Lake Report,* which summarizes the status and trends of these indicators every three years, is the LCBP's primary outlet for communicating this process to the public.

In addition, the LCBP works in close collaboration with federal, state, and provincial partners to track the success of specific management initiatives. The LCBP has published an annual report of LCBP-funded accomplishments for our state and federal partners to use in tracking performance measures within their unique accounting systems since Federal Fiscal Year 2016. For nutrient management-related projects, the LCBP also provides specific project information to the States of Vermont and New York for use in their phosphorus accounting systems for TMDL progress tracking. This approach reduces the risk of "double counting" management interventions, while also ensuring that management interventions funded solely by the LCBP are included within the respective State and Federal accounting systems.

Each of the four goals of the 2022 plan identifies anticipated metrics that will measure success in implementation of the Plan at the goal and strategy levels. These targets reflect anticipated numbers of management interventions, funding for research programs, audiences for outreach campaigns, and recreation programs. This information will be provided in our annual report to our state and federal partners to use in their performance tracking systems.

Promote and Advise Partner Communications

Protection and restoration of the Basin relies on continued input and support from numerous individuals and groups. Decisions concerning the management of the resources in the Lake Champlain Basin must be made through a consensus-based, collaborative process that encourages the expression and understanding of diverse viewpoints. This process helps integrate economic and environmental considerations into management actions and ensures that a focus on implementation at the local level is maintained. Through its committees and the partner workgroup in which it participates, the LCBP helps to ensure that the numerous stakeholders working on Basin issues communicate regularly.

LCBP Committees

LCBP staff will continue to coordinate and facilitate regular meetings of the Lake Champlain Steering Committee, the Executive Committee, and its three advisory committees: Technical, Education & Outreach, and Heritage Area Partnership. These committees are charged with developing annual budget priorities, informing project workplans and providing recommendations on draft project reports. Subcommittees, including the Aquatic Nuisance Species Subcommittee and Toxic Substances Workgroup of the Technical Advisory Committee, meet ad hoc to focus on specific issues and share information.

Federal Partners Workgroup

The Lake Champlain Federal Partners Workgroup consists of many of the U.S. federal agencies working toward goals in the Lake Champlain watershed and is currently coordinated by LCBP staff. These partners include the core group of federal agencies that are signatories of *Opportunities for Action,* as well as several other agencies. Federal agencies formally participating in the Workgroup through a Memorandum of Understanding include the United States Environmental Protection Agency (USEPA), National Park Service (NPS), Natural Resources Conservation Service (NRCS), United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), United States Forest Service (USFS), and the United States Geological Survey. Other agencies, including Lake Champlain Sea Grant (a program within the National Oceanic and Atmospheric Administration), participate in this group informally. These agencies allocate resources, either in the form of staff time or funding for programmatic areas including research, monitoring, training, infrastructure improvements, or management interventions. A renewal of the Federal Partners Workgroup MOU may add new federal agencies to the agreement, including the U.S. Department of Transportation (USDOT), USDA-Rural Development, USDA-Farm Services Agency (FSA), Federal Emergency Management Agency (FEMA), Department of Housing and Urban Development (HUD), the U.S. Coast Guard, the National Weather Service (NWS) and others. In 2016, the LCBP began coordinating and facilitating communications and meetings

for the group. These meetings bring together staff from many of the federal agencies working toward management of the Lake Champlain watershed. These meetings provide an opportunity for agency representatives to report on recent projects, discuss upcoming initiatives and funding opportunities, and develop new collaborative programs targeting priority management goals within the Lake Champlain Basin.

Ad hoc Meetings and Workgroups

LCBP staff frequently provide meeting facilitation for partners. Most recently, the International Joint Commission (IJC) requested meeting facilitation services to coordinate discussions of potential flood management strategies for Lake Champlain, in response to the spring 2011 flooding event that affected many residents on the Lake Champlain shoreline as well as those downstream of Lake Champlain along the Richelieu River in Québec.

At the request of partners, the LCBP periodically organizes workgroups or discussions focusing on specific issues. LCBP resources often are used to arrange site facilities for the event, coordinate the meeting, facilitate the conversations during the event, and provide meeting follow-up information for participants. The LCBP anticipates similar requests to facilitate cross-border (bi-state, state-provincial and bi-national) conversations, particularly in Missisquoi Bay. The Program also is engaged in coordinating conversations regarding aquatic invasive species vectors through canalways connecting the Hudson River to Lake Champlain in New York and allowing for navigation of the Richelieu River to and from Lake Champlain in Québec.

Partners In Action

Countless partners—including federal, state, and provincial agencies, watershed and conservation groups, heritage and recreation organizations, and local citizens—work to prevent pollution and protect, restore, enhance, and enjoy the water quality of the Lake Champlain Basin. Many of these partners are guided primarily by their own plans and priorities, such as the Phosphorus TMDL Implementation Plan for Lake Champlain or the Aquatic Invasive Species Rapid Response Plan. The intent of *OFA* is to provide guidance to Steering Committee and advisory committee members in identifying the annual budget priorities and tasks for the LCBP, including its function of collaborating with and coordinating the efforts of these partners. While OFA focuses on the actions of agency partners and other stakeholder organizations, it also aims to improve the knowledge of lake issues among the public and the private sectors, and to encourage positive changes in stewardship behaviors.

Local Residents and Visitors

The cumulative effect of many individual actions makes a substantial difference in the complex issues facing the Lake Champlain Basin. In this way, all members of the public are key partners in implementation of *OFA*. More than 600,000 people live, work, and play in the Lake Champlain Basin, which they share with more than six million annual visitors. The need for increased public involvement underlies all the actions in the plan. Individual changes in household and workplace practices, such as maintaining septic systems properly and reducing the use of toxic chemicals in cleaning and lawn care, are needed. Citizens can volunteer for local boards, monitor their community activities, and participate in citizen groups that work for a cleaner Lake. Visitors bring significant tourism income and an appreciation of the region's natural assets, which in turn encourages sustainable practices by local businesses. *OFA* emphasizes education and outreach programs to encourage public involvement to augment the efforts of agencies to achieve management goals for Lake Champlain.

State and Provincial Agencies

State and provincial agencies in New York, Québec, and Vermont have several key roles in protecting the Basin's resources. They administer several critically important resource management programs, including water-quality protection programs, wetlands protection programs, fish and wildlife management programs, and recreation and cultural resource programs, among others. The states and province also provide technical and financial assistance, such as training for wastewater treatment plant operators and funding for local nonpoint source pollution control projects, to ensure that the appropriate people have the expertise to implement their programs.

U.S. Federal Agencies

Many of the activities necessary to improve the watershed must occur at the local and state levels. However, environmental restoration efforts in the Lake Champlain Basin often benefit from the work of federal agencies that implement key projects on the ground. Agency support of the plan is coordinated through a unique network of partnerships. Several federal agencies have signed a Memorandum of Understanding to facilitate their cooperation and coordination through the LCBP. Representatives of these agencies are active in many LCBP activities.

- The **U.S. Environmental Protection Agency** provides financial and technical support to the States and to the LCBP for implementing several federal environmental programs and is responsible for implementation and enforcement of the Clean Water Act, including approval of Total Maximum Daily Loads for Lake Champlain segments, the Safe Drinking Water Act, and other key environmental laws. The agency ensures that all Americans are protected from significant risks to human health and the environment.
- The **U.S. Department of Agriculture** provides financial and technical assistance for best management practices that control nonpoint source pollution, particularly from agricultural runoff.

- The **U.S. Department of the Interior** supports the management plan through the work of three agencies.
  - » **The U.S. Fish and Wildlife Service** cooperates with the States in the management of fish and wildlife resources, plans and carries out site-specific habitat restoration projects, operates a National Wildlife Refuge and two National Fish Hatcheries that support work in the Basin, works with partners on landscape scale conservation planning, and helps ensure that the actions of other federal agencies are consistent with the needs for fish and wildlife conservation.
  - » The **National Park Service** serves as a partner through the National Heritage Areas Program to provide support, financial assistance, and advice on managing the important cultural heritage and recreational resources within the Champlain Valley National Heritage Partnership.
  - » The **U.S. Geological Survey** provides financial and technical support through stream gauge monitoring and watershed research concerning nutrients and contaminants of concern.
- The U.S. Army Corps of Engineers (USACE) is authorized by Section 542 of the Water Resources Development Act of 2000 (revised 2007) to provide assistance with planning, designing, and implementing projects that contribute to protection and enhancement of the Lake Champlain water quality, water supply, ecosystem, and other water-related issues while preserving and enhancing the economic and social character of the communities within the watershed. The USACE works in partnership with the LCBP to implement the Section 542 program within the Lake Champlain Basin. Additional WRDA authorizations may also be accessed to allow USACE to execute projects in the Champlain Basin.
- The U.S. Department of Commerce, through the National Oceanographic and Atmospheric Administration's National Sea Grant College Program, provides financial and technical support for research, management of fisheries and other aquatic resources, and related watershed programs operated by Lake Champlain Sea Grant. In 2018, Lake Champlain Sea Grant was advanced to Institute status. The Institute designation gives the program increased national recognition and an enhanced ability to support research throughout the region.

NEIWPCC

NEIWPCC is a regional commission that helps the states of the Northeast preserve and advance water quality. Established in 1947 by the U.S. Congress, NEIWPCC engages and convenes water quality professionals and other interested parties from New England and New York to collaborate on water, wastewater, and environmental science challenges across shared regions, ecosystems, and areas of expertise. NEIWPCC's executive committee and commissioners (gubernatorial appointees from each of its member states) set the goals and priorities implemented by the Executive Director and the staff. NEIWPCC is a federal grant recipient and receives Section 120 funds from the US EPA, as well as other federal agencies, to assist and support the LCBP in implementing OFA. As the host entity of the LCBP, NEIWPCC also provides programmatic advice; hires and supervises staff; manages subawards and contracts; provides administrative, financial, and human resources support; provides direction to the LCBP and the work of its staff; and participates in the Lake Champlain Steering Committee as a non-voting member.

In 1992, the Lake Champlain Management Conference sought NEIWPCC to administer the newly formed LCBP by managing the bulk of its personnel and financial resources according to programmatic goals laid out by the Management Conference (and subsequently the Lake Champlain Steering Committee), a responsibility which NEIWPCC accepted. The role of NEIWPCC in administering finances for the LCBP was further codified in the Great Lakes and Lake Champlain Act of 2002 (Clean Water Act §120), in which NEIWPCC was named alongside the States of Vermont and New York as an entity authorized to receive funding from the USEPA to administer the LCBP. LCBP operations handled by NEIWPCC conform to its Quality Management Plan, approved by the USEPA.

Local Governments

Most of the solutions to problems affecting the Basin, such as nonpoint source pollution from urban and agricultural land uses, failing septic systems, planning for future development, and recreation conflicts, are best implemented at the local level. The plan identifies several actions, mainly in the Thriving Communities Goal, through which the LCBP can assist local governments to address these matters. Key partners likely to implement such actions are selectboards, local boards and commissions. Because local governments have primary authority over planning—and increasingly, financial responsibility—for the impact of their transportation infrastructure, it is essential that they incorporate a watershed planning focus into their work.

Regional Government Organizations

Watersheds cross town boundaries, and one town acting alone may not be sufficient to address a particular issue. Regional organizations, such as the county planning offices in New York, Municipalité Régionale de Comté (Regional Municipalities) in Québec, and the Regional Planning Commissions in Vermont, work with several jurisdictions to coordinate efforts that address issues of mutual concern. They will continue to be key partners in focusing implementation efforts through a watershed approach to planning and ensuring that the recommendations of the Plan are carried out equitably.

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1. Following a rebrand in 2020, the New England Interstate Water Pollution Control Commission is known exclusively as NEIWPCC.
2. Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont

Legislative Bodies

Legislative bodies in the Basin are responsible for enacting laws and appropriating funds for many programs important to the Lake. Consistent policies in New York, Québec, and Vermont help to ensure effective and equitable management. The LCBP seeks opportunities to facilitate coordination among the lawmaking bodies of the three jurisdictions. Successful implementation requires that legislators respond decisively and creatively to protect and enhance the resources of the Basin in the face of technical, political, and financial obstacles.

Nongovernmental Organizations

Many actions in the Plan list nonprofit and citizen-based organizations as potential key partners. Watershed associations and environmental groups have long helped to organize and support local action, including water-quality monitoring, research, conservation of cultural heritage resources, educational workshops, streambank stabilization, toxin reduction initiatives, aquatic species control, public forums, and the encouragement of low-impact recreational activities. Their continued communication with the LCBP about emerging issues and priorities is invaluable.

Academic Institutions and Research Organizations

Academic institutions, research organizations, and cooperative extension programs have served vital roles in studying Lake Champlain and its Basin. Institutions such as the University of Vermont, SUNY Plattsburgh, Paul Smith's College, St. Michael's College, Institut de recherche et de développement en agroenvironnement (IRDA), McGill University, Université de Sherbrooke, Cornell University, Middlebury College, Castleton and Northern Vermont universities, and others have conducted a variety of research projects on the Lake and the Basin. They also have educated students, teachers, and other citizens about Lake Champlain issues. Many actions in the Plan call for research concerning Lake-wide problems and emerging issues. Continued OFA implementation requires continued participation by academic institutions and research organizations and depends greatly on the soundness of data and information collected by them.

The Lake Champlain Research Consortium (LCRC), a multidisciplinary research and education program that includes many of these institutions, collaborates with the LCBP periodically to sponsor research symposia and conferences, and helps identify research needs and priorities related to the management issues in the Plan.

Coordinating Organizations

The need for state and international communication and cooperation regarding the management of the Lake Champlain Basin has been apparent since the 1940s. Numerous successful efforts have brought the two states and countries together to deal with common issues since that time.

The Lake Champlain Fish and Wildlife Management Cooperative was created through written agreement in 1973 by the USFWS, the NYSDEC, and the Vermont Department of Fish & Wildlife. The Cooperative Agreement, which was updated in 1995 and renewed in 2009, created a Policy Committee consisting of program directors from the three agencies and management and technical committees of agency staff to coordinate fish and wildlife programs of interstate significance in Lake Champlain. Organizations in Québec are not formal partners with the Cooperative but coordinate and communicate with the Cooperative.

International Treaty Organizations

The Boundary Waters Treaty of 1909 created the International Joint Commission (IJC) to resolve and to avoid potential disputes regarding the use of boundary waters along the U.S. and Canadian border. IJC membership is comprised of six commissioners appointed by the President of the United States and the Prime Minister of Canada. The IJC convened a Champlain-Richelieu Board during the 1970s to examine regulation of water levels in Lake Champlain and more recently supported research and planning endeavors focused in the Missisquoi River Basin. In 2016, the IJC embarked on a new planning effort to address flooding issues in the Lake Champlain-Richelieu River corridor. This project is anticipated to be complete by late 2022, with several recommendations to be issued to the governments of Canada and the United States.

Business and Industry

The activities of private businesses and chambers of commerce are a critical component of protecting the resources that support the economic vitality of the Basin. Voluntary efforts to recycle and prevent pollution are examples of how the private sector has been active in implementing elements of the Plan. Educational partnerships with television and other news media have tremendously increased public awareness of the importance of individual citizen participation and community involvement in good Lake stewardship practices. Chambers of commerce have been effective at drawing together business interests to assist in the planning process and will continue to contribute knowledge through the course of Plan implementation.

Secure and Direct Funding

The cost of implementing the Plan is high, though not as high as the potential costs of failing to act (LCBP Technical Report 81: An Assessment of the Economic Value of Clean Water in Lake Champlain. University of Vermont, Gund Institute for Ecological Economics, 2015). The ability to implement watershed programs relies on the availability of and access to funding sources. Each fiscal year, the LCBP receives assistance awards from the USEPA, National Park Service, and the Great Lakes Fishery Commission through NEIWPCC. These funds are the basis of the LCBP annual budget, by which essential functions are supported, including annual staffing levels, core programmatic tasks (e.g. monitoring programs), and new "capital" projects, such as targeted research projects, management interventions, heritage and recreation grants, or outreach

campaigns. The LCBP budget is aligned with the four goals of OFA. Additional funding opportunities may be considered where appropriate. Efforts will be made to ensure the LCBP does not secure funds from additional funding sources that may have been directed to other watershed groups working on similar goals in the Basin.

Conduct Sound Research

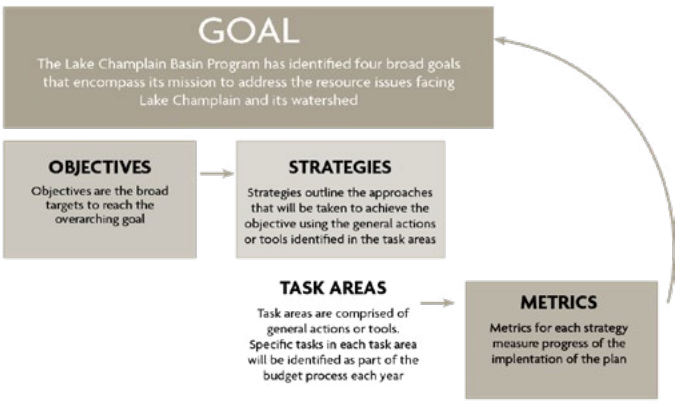
The Plan identifies several areas in which research is needed. Research has been an important component of preparing and updating the Plan and will continue to provide critical information as implementation evolves. Improved knowledge of the physical, chemical, biological, and social characteristics of the Lake and Basin will help resource managers make effective policy and management decisions in the future.

Regularly Update Plan Recommendations

Because environmental conditions in the Basin change over time and new technologies are routinely discovered, priorities for action in the Plan may change. Many priorities identified in the 2022 plan were generated through a virtual Summit held in June 2021, which included a facilitated discussion among participants from the Steering Committee and all LCBP advisory committees. Moving forward, some management programs may become more important, others less so. The Plan will be reviewed and updated periodically (ideally every five years) to reflect these changing conditions. Moreover, the Steering Committee may periodically identify new actions requiring implementation based on reports of emerging issues from advisory committees.

OVERVIEW OF GOALS

The Lake Champlain Basin Program has identified four goals that represent the key resource issues facing Lake Champlain and its watershed. Each goal is addressed by **objectives, strategies, and task areas.** The Plan also identifies anticipated **metrics** for each strategy to measure progress in implementation of the Plan. Objectives are the target areas for action that will help to reach the overarching goal of the chapter. Strategies outline the approaches that will be taken to achieve the objective using the general actions or tools identified in the task areas. Specific tasks in each task area will be identified as part of the budget process each year. The Lake Champlain Steering Committee will maintain an implementation schedule, to be developed independent of this Plan, which will be reviewed annually at the start of each budget cycle. The implementation schedule will identify a suite of strategies or priorities related to select topical areas for support in each budget cycle. This approach gives the Lake Champlain Basin Program committees an opportunity to review the task areas for each goal to determine progress made.



MANAGEMENT THEMES

Several common themes that define the LCBP's approach to reaching the ecosystem targets are present in all four goals outlined in this management plan. These themes reflect a whole-watershed management approach that addresses current and future resilience to environmental, economic, and political change.

Holistic Watershed Approach

More than 95 percent of the water in Lake Champlain passes through the 8,234 square miles (21,326 km2) of the Basin as surface and subsurface runoff before reaching the Lake. As a result, land use activities and pollution sources throughout the Basin have a tremendous impact on the Lake and its ecosystems. Restoration or protection efforts based on watershed boundaries rather than political boundaries better address polluted or threatened areas. In addition to applying the watershed approach on a Basin-wide level, OFA encourages the watershed approach at a local level. This allows citizens to improve water quality based on their knowledge of their local area, and for neighboring communities to develop innovative ways to solve pollution problems within their local watersheds. Empowering local communities and their organizations to collaborate gives any effort a better chance of real, sustained success. The plan continues to use a watershed approach that links the Lake with activities in its watershed.

The Lake Champlain Steering Committee recognizes that all segments of the Lake Champlain watershed are important, and that each segment has its own unique management issues. Some of these segments are further from their management targets than others, particularly with respect to nutrient management issues. Several state and federal partners have targeted specific watersheds to focus resources for nutrient pollution reduction in their respective management planning efforts. These watersheds include Missisquoi Bay, St. Albans Bay, and the South Lake (Crown Point area southward). The LCBP will work with state and federal partners to allocate a portion of LCBP funds for nutrient reduction in these high priority watersheds each year. These additional funds may be used for direct management interventions on the landscape, for planning initiatives, research, or short-term targeted monitoring programs designed to identify critical locations for future work.

Resilience to Climate Change
The climate in the Basin is changing and we must be prepared for an environment that may look very different in the future than the one we see today. Scientists predict a warmer, wetter watershed, which will have far-reaching impacts on tourism, water quality, frequency and toxicity of harmful algal blooms, invasive species spread, and many other management priorities. Recent research at the University of Vermont has shown that climate change is occurring at a faster rate in the region than originally predicted. Local, state, provincial and federal governments are starting to act. Planning for these changes at a watershed scale will create more resilient natural systems and human communities. Throughout each goal of the plan, principles that address local and regional-level climate change adaptation are embedded in the strategies for implementing action.

Science-Driven Collaborative Management
Management of the Basin's resources is based on consistent, high-quality data and current scientific knowledge that is developed by a diverse array of federal, state, provincial, local, and not-for-profit partners. Just as policy development and implementation of management actions require a consensus-based approach to decision making, the collection and development of the data and knowledge upon which those actions are based requires cooperation and coordination.

Integration of the Environment and the Economy
A healthy Lake Champlain is crucial to a strong regional economy, and a strong economy is good for the Lake. This plan strives to protect and restore the ecological and cultural resources of the Basin while maintaining vibrant local economies by identifying cost-effective solutions and ensuring efficient use of resources by coordinating funding efforts and management actions.

Measurable Progress
The LCBP carefully tracks the outcomes of funded projects to measure progress. Nearly $50 million in projects, monitoring efforts, programs and interpretive events were completed or initiated during the implementation of the 2017 management plan. This includes projects and programs initiated and managed by the States of New York and Vermont, and by the LCBP. These projects will improve water quality, expand research and monitoring programs and support public outreach. During that time, over 500 projects were supported with LCBP funds, ranging from curriculum development and cultural heritage preservation to aquatic invasive species spread prevention and nutrient reduction programs.

EXPLANATION OF PROGRESS TRACKING METRICS

Phosphorus load reductions are required by state, federal and provincial law. The LCBP was established with the charge of coordinating efforts among government agencies working toward these outcomes. Within the constraints of the LCBP's annual budget, the Lake Champlain Steering Committee has identified priorities for the LCBP for each goal. For each of these priorities, anticipated metrics will be tracked by the LCBP and summarized in an annual report of activities. These metrics also will be communicated to the relevant jurisdictional partners for their internal tracking purposes. The collective success of the LCBP and its partners is documented in the tri-annual State of the Lake and Ecosystem Indicators Report, which tracks progress in addressing issues toward phosphorus reductions, human health and toxins, and biodiversity and aquatic invasive species.

CLEAN WATER

GOAL I: The Lake Champlain Basin's lakes, ponds, rivers, and streams will provide high-quality drinking water and safe recreation opportunities, and sustain diverse ecosystems, vibrant communities, and working landscapes.

Clean water is critical for the diverse habitats, working landscapes, and vibrant communities that sustain us. Pollution from human activities across the watershed impairs the water quality of the Lake, reduces public access, and decreases economic opportunities. Lake Champlain provides high-quality drinking water to more than 145,000 people in the Lake Champlain Basin. Maintaining and improving this unique resource for drinking water is critical to achieving the Clean Water goal and supporting vibrant communities. Lake Champlain is among the 25% of lakes in the United States that are impaired by excess nutrients (USEPA 2011), and among the 40% of lakes with health advisories for fish consumption due to elevated mercury concentrations (USEPA 2011).

SCIENTIFIC UNDERSTANDING

Sound science is fundamental for action to achieve clean water in the Lake Champlain Basin. Our understanding of lake conditions relies on ongoing monitoring and targeted, management-driven research. Data from monitoring networks like the Lake Champlain Long-Term Monitoring Program are critical for identifying areas in need of pollution interventions and making management decisions to allocate limited resources. New technologies and innovative research will be increasingly necessary to address threats to clean water.

NUTRIENT LOADING

Although nutrients are essential for all ecosystems, excessive levels of nutrients can impair water quality. Phosphorus in particular has been identified as a key nutrient that has a direct influence on cyanobacteria blooms in Lake Champlain. Phosphorus inputs to Lake Champlain must be reduced to meet the Clean Water goal. Phosphorus Total Maximum Daily Load (TMDL) regulations for Vermont and New York and reduction plans for the Québec portion of the watershed are guiding forces for the LCBP's phosphorus reduction efforts to benefit Lake Champlain. Actions outlined in this Plan will directly align with state and provincial partner plans to meet these important phosphorus reduction targets.

Sound science is critical to efforts to protect and restore the Lake Champlain Basin. Photo: Brendan Wiltse

CONTAMINANTS

Contaminants that originate from human activities and products, including pharmaceutical products, pathogens, road salt, and microplastics, pose distinct and complex threats to the waterways of the Basin. Their sources, environmental fate, and effect on biota and human health often are poorly understood. The variety and environmental persistence of these substances necessitate continued monitoring and scientific investigation to prioritize management actions.

CLIMATE CHANGE

The effects of climate change have been widely documented in the Lake Champlain Basin. Rising air temperatures, warmer water temperatures, less frequent and persistent ice cover, more frequent and persistent rainstorms, and more precipitation falling as rain rather than snow all combine with other pressures that threaten Lake Champlain water quality. To respond to these pressures, it is necessary to better understand their effects, and then adapt to mitigate the negative impacts. A new climate change-focused objective aims to close knowledge gaps and direct resources that will provide benefits like shading streams to reduce water temperatures, reconnecting floodplains to reduce flood risk, and minimizing road-salt related salinization of Lake Champlain.

MEASURES OF SUCCESS

Quantifying measures of success is critical to understanding the benefits of the LCBP's work and communicating on progress toward the Clean Water goal for the restoration of Lake Champlain. Each strategy within the Clean Water goal has metrics that will tell the story of how Opportunities for Action is implemented, as identified in the tables below. Key strategy-level metrics will also be aggregated to provide a summary of implementation for the Clean Water goal.

GOAL-LEVEL METRICS

- Number of applied research projects supported with results provided to managers and stakeholders
- Amount of funding allocated toward research
- Amount of funding allocated toward implementation
- Number of pollution-reducing best management practices installed
- Amount of phosphorus pollution reduced
- Number of clean water improvement designs or plans funded

OBJECTIVES

Objective I.A

Improve understanding of water quality conditions and trends; determine the effectiveness of past management and inform future management decisions.

Strategy	Task Area	Metrics
I.A.1 – Fund and interpret monitoring and management-oriented research.	I.A.1.a – Support programs and initiatives that increase accessibility of Lake Champlain Basin data to foster new management-oriented research and collaboration.	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward research* • *Creation of a Lake Champlain data hub*
	I.A.1.b – Support research to increase understanding of groundwater transport of nutrients and contaminants in the Lake Champlain Basin through monitoring and modeling efforts.	
	I.A.1.c – Support research to understand root causes of in-lake tributary loading, and other environmental trends to effectively focus restoration resources.	
	I.A.1.d – Maintain and expand the Lake Champlain Long-Term Monitoring program to include an in-situ monitoring network that effectively detects ecosystem conditions and changes and informs policy decisions and public interest.	
	I.A.1.e – Support and promote programs that expand sub-watershed monitoring to inform targeted watershed objectives.	
	I.A.1.f – Support research to improve understanding of cyanobacteria in Lake Champlain through expanding existing monitoring programs, increased cyanotoxin testing, and new technologies.	
	I.A.1.g – Support monitoring to screen lake water for toxic substances, including herbicides, pesticides, and personal care products.	
	I.A.1.h – Support research and monitoring programs to inform consumption advisories for Lake Champlain fishes.	

Strategy	Task Area	Metrics
I.A.2 – Fund and interpret research on management decisions and best management practices (BMPs).	**I.A.2.a – Support research to develop innovative management approaches likely to improve water quality.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward research*
	I.A.2.b – Support research to increase understanding of factors affecting BMP performance and efficiency, including the potential effects of climate change.	
	I.A.2.c – Support research to assess progress of existing water quality management programs to inform new decisions, priorities, and management trajectories.	
	I.A.2.d – Support research to develop strategies that reduce public beach closures.	
I.A.3 – Fund and interpret research to better understand nutrient dynamics and limit their impact.	**I.A.3.a – Support research to quantify the mass balance, forms, and transportation routes of phosphorus for the entire Lake Champlain Basin.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward research*
	I.A.3.b – Support research to close knowledge gaps on internal nutrient loading in key areas of the lake, with management recommendations.	
I.A.4 – Fund and interpret research on contaminants in the Lake Champlain Basin.	**I.A.4.a – Support research to reduce agrochemical application and runoff of pesticides, herbicides, and other agrochemicals.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward research*
	I.A.4.b – Support research to improve understanding of road de-icing salt impacts and effective management strategies.	
	I.A.4.c – Support research to improve understanding of emerging contaminants and points of control.	

Objective I.B

Reduce contaminants of concern and pathogens.

Strategy	Task Area	Metrics
I.B.1 – Reduce contaminant pollution.	**I.B.1.a – Fund and promote programs that reduce public beach closures.**	• *Amount of funding allocated toward implementation* • *Number of planning and design projects to reduce contaminant pollution* • *Number of projects supported that directly reduce contaminant pollution*
	I.B.1.b – Fund and promote programs that increase the efficiency of use of pesticides, herbicides, and other agrochemicals, and limit their transport to waterways.	
	I.B.1.c – Fund and promote programs that reduce de-icing salt application and limit their transport to waterways.	
	I.B.1.d – Fund and promote programs that upgrade wastewater treatment infrastructure to effectively treat contaminants of concern, including PFAS and microplastics.	
	I.B.1.e – Fund and promote programs that reduce the prevalence of contaminants of concern in Lake Champlain Basin waterways.	

Objective I.C

Reduce Nutrient Loading.

Strategy	Task Area	Metrics
I.C.1 – Reduce nutrient inputs from streambanks.	**I.C.1.a – Fund and promote programs to improve stream equilibrium and connect rivers to their floodplains in critical areas of the Lake Champlain Basin.**	• *Amount of funding allocated toward implementation* • *Number of pollution-reducing best management practices installed* • *Amount of phosphorus pollution reduced* • *Number of river restoration projects implemented* • *Area of floodplain restored* • *Length of stream/river restored*
	I.C.1.b – Fund and promote programs to protect or enhance river corridors for nutrient reduction and flood resilience.	

Strategy	Task Area	Metrics
I.C.2 – Reduce nutrient inputs from agriculture.	**I.C.2.a – Fund and promote programs that install recommended BMPs, provide technical assistance, improve soil health, and optimize farm operations to reduce nutrient load and improve water quality.**	• *Amount of funding allocated toward implementation* • *Number of pollution-reducing best management practices installed* • *Amount of phosphorus pollution reduced* • *Area of land recovered or floodplain restored* • *Number of farms supported*
	I.C.2.b – Fund and promote programs that recover agricultural land in floodplains to restore floodplain function, reduce nutrient inputs, and increase flood resilience.	
	I.C.2.c – Fund and promote programs that help farmers meet water quality regulations with targeted cost-share support for small farms, especially in critical sub-watersheds.	
	I.C.2.d – Fund and promote programs that remove phosphorus from tile drains and agricultural ditches.	
	I.C.2.e – Fund and promote economical and sustainable agricultural practices that address water quality concerns.	
I.C.3 – Reduce nutrient inputs from developed lands.	**I.C.3.a – Fund and promote programs to reduce effective impervious surface area, especially in critical watersheds.**	• *Amount of funding allocated toward implementation* • *Number of pollution-reducing best management practices installed* • *Amount of phosphorus runoff reduced* • *Number of preliminary (30%) infrastructure designs funded* • *Number of full (100%) infrastructure designs funded* • *Area of impervious surface treated*
	I.C.3.b – Fund and promote green stormwater infrastructure design and installation, especially in combined stormwater-sewer service areas and in critical watersheds.	
	I.C.3.c – Fund and promote programs and interventions aimed at reducing nutrient pollution from high-density shoreland areas around lakes and ponds.	
	I.C.3.d – Fund and promote programs for asset management and water quality upgrades for wastewater treatment facilities.	

Strategy	Task Area	Metrics
I.C.4 – Reduce nutrient inputs from forested lands.	**I.C.4.a – Support programs to restore and protect riparian forests and corridors.**	• *Amount of funding allocated toward implementation* • *Number of pollution-reducing best management practices installedAmount of phosphorus runoff reducedArea of forested treated with BMPs* • *Number of landowners reached*
	I.C.4.b – Fund and promote programs that assist landowners with meeting water quality regulations on forested lands.	
	I.C.4.c – Fund programs to promote forestry BMPs while protecting habitats and improving climate change resilience.	
I.C.5 – Implement recommendations from the Missisquoi Bay bi-national phosphorus reduction task force.	**I.C.5.a – Support recommended tasks to reduce phosphorus pollution and cyanobacteria bloom intensity and frequency in Missisquoi Bay.**	• *Number of projects that address task force recommendations*

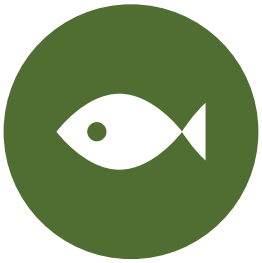
Objective I.D

Support research to understand the impact of climate change on clean water and act to adapt to climate change. impacts

Strategy	Task Area	Metrics
I.D.1 – Fund and interpret climate-change-oriented research.	**I.D.1.a – Support research to assess the impacts of climate change on nutrient loading from watershed and internal sources.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward research*
	I.D.1.b – Support research to improve understanding of the impacts of climate change on nutrient cycling dynamics in Lake Champlain.	
	I.D.1.c – Support research to quantify the impacts of climate change on phytoplankton communities.	
	I.D.1.d – Support research to improve understanding of the impacts of climate change on cyanobacteria bloom dynamics.	
	I.D.1.e – Support research to assess the impacts of climate-change-driven land use changes on water quality.	
	I.D.1.f – Support research to quantify the impacts of climate change on contaminant sources and transport.	

Strategy	Task Area	Metrics
I.D.1 *continued*	**I.D.1.g – Support research to improve understanding of the impacts of climate change on de-icing salt application and salinization.**	
	I.D.1.h – Support research to assess the impact of climate change on water availability and water use.	
I.D.2 – Adapt to climate-change-caused water resource impacts.	**I.D.2.a – Fund and promote clean water implementation programs that have co-benefits for adapting to climate change.**	• *Amount of funding allocated* • *Number of climate change adaptation projects supported* • *Area of floodplains restored* • *Area of wetlands restored*
	I.D.2.b – Fund and promote programs to protect and restore natural infrastructure systems that are most vulnerable to the impacts of climate change, including floodplains, wetlands, upland streams, and headwater areas.	
	I.D.2.c – Fund and promote programs to reduce the impacts of increasing water temperatures.	
	I.D.2.d – Fund and promote programs to reduce the impacts of climate change on water availability and use.	

HEALTHY ECOSYSTEMS



GOAL: The Lake Champlain Basin's ecosystems will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and vibrant communities.

Healthy ecosystems provide invaluable services such as native species habitat, nutrient filtration, flood resilience, and sediment retention. Diverse ecosystems in the Lake Champlain Basin support a lake that provides clean water for drinking and recreating, and healthy fish and wildlife populations. This goal will strengthen the aquatic ecosystem of Lake Champlain with increased understanding of climate impacts, evaluating restoration programs, improving connectivity, supporting restoration efforts for species of concern, and reducing the risk of new invasions by non-native species.

CLIMATE CHANGE

The effects of climate change on ecosystem health have been widely documented in the Lake Champlain Basin. Supporting climate change research can inform how increasing air and water temperatures, lake levels, flood events, less frequent and persistent ice cover, and changing land use all combine with other pressures that threaten habitats and species in the Basin. To respond to these pressures, it is necessary to better understand their effects and then adapt to minimize negative impacts. This new Climate Change objective will support and interpret research that identifies the impacts of changes in climate to the Lake's habitats and species, economic and ecological impacts of aquatic invasive species, refugia sites for species of conservation need, and impacts to lake trout. The objective also supports adaptation to climate change impacts by building and maintaining healthy soils in a range of habitats that support ecosystem functions.

ECOSYSTEM MANAGEMENT EVALUATION

Resource managers, businesses, organizations, and landowners in the Basin are investing in restoration projects to protect priority habitats and species of concern. Monitoring and evaluation of restoration projects including wetland and retention pond project installations, riparian buffers and plantings, dam removal, in-stream management, and tracking species of greatest conservation need are critical to informing the most effective and efficient use of limited resources. It is also important to support research and identify gaps that are needed to align policy with healthy ecosystems goals.

CONSERVATION OF HABITAT

Natural communities face many threats and have experienced significant changes in biodiversity and abundance during the last few centuries. These threats include loss, degradation and fragmentation of wetland and riparian habitat, overexploitation of highly valued species, introduction of new species to the ecosystem, and climate change.

Conservation of riparian corridors, floodplains, lake shorelands, wetlands, and supporting headwater connectivity in the Basin protects and restores these habitats so they can provide ecosystem functions and support a greater diversity of species. For example, dams and undersized or improperly placed road-stream crossings can reduce fish and other aquatic organism habitat by interrupting passage from one stream segment to another. Poorly planned land development also can lead to reduced habitat connectivity, increased erosion and sedimentation, stream bank instability, and increased nutrient and sediment loadings in rivers resulting in further degradation and loss of aquatic habitats. Habitat restoration is also an effective way to support rare, threatened, or endangered species.

AQUATIC AND RIPARIAN BIODIVERSITY

Maintaining high biodiversity is critical for a healthy ecosystem in the face of increasing threats from habitat loss and degradation, aquatic invasive species, and climate change. Support of Lake Champlain food web research informs management decisions by better understanding internal and external drivers such as the impact of new aquatic invasive species or warming water temperatures. Research is also important to help identify information gaps and restoration needs for protected species such as the lake trout and lake sturgeon. To enhance the Lake Champlain fishery, the Lake Champlain Fish and Wildlife Management Cooperative regularly monitors the state of populations of landlocked Atlantic salmon, lake trout, brown trout, American eel, sea lamprey, lake sturgeon, walleye, and northern pike, and conducts targeted research on limiting factors to guide future management. In response and to ensure sustainable native fish populations, state and federal agencies assess and stock native and sport fish species in Lake Champlain. Reducing aquatic and riparian fragmentation is another way to protect native species such as brook trout, Atlantic salmon, and mudpuppies by removing dams and culverts that limit access to cold water streams for spawning and regaining access to historic habitat.

Controlling invasive waterchestnut and other effots to improve habitat require an all-hands-in approach. Photo: LCBP

AQUATIC INVASIVE SPECIES

Aquatic invasive species (AIS) are non-native plants, animals, and pathogens that harm the environment, economy, or human health. AIS that become established in the Basin can pose serious threats to native fish, wildlife, and plant populations, impede recreational activities, significantly alter the ecosystem of the Lake, and damage the economy of the region.

Support of early detection monitoring and effective responses to new infestations are important to limit invasive species impacts to habitat, native species, and human use and enjoyment of Lake Champlain and other bodies of water in the Basin. The Vessel Incidental Discharge Act of 2018 authorized the Great Lakes–Lake Champlain Invasive Species Program, which would support early detection monitoring and population of the Lake Champlain Aquatic Nuisance Species Information Database. This new database, connected with a similar database established for the Great Lakes, would help improve invasive species risk assessments and efficiently create an AIS watchlist for the Basin, updated with information from the Great Lakes database. Continued support of rapid response capabilities including the Lake Champlain AIS Rapid Response Task Force and its emergency fund has allowed for responses to contain and provide education and outreach for spiny and fishhook waterflea and round goby threats.

Lake Champlain aquatic invasive species management and response benefits from maintained involvement in regional and national programs such as the national Aquatic Nuisance Species Task Force and the Northeast Aquatic Nuisance Species Panel which connects the Basin to the latest research, control technologies, and education and outreach programs.

AIS enter the Lake Champlain Basin through several pathways, most commonly through interconnected waterways such as the Champlain and Chambly Canals. These human-made canals connect Lake Champlain to the Hudson and Richelieu Rivers. Other priority pathways include overland transport of AIS through human activities such as boating and bait transport. Implementation of a barrier on the Champlain Canal and evaluation of invasive species transfer through the Chambly Canal would address the highest priority pathways, while support of boat launch steward programs and expansion of access to decontamination stations will reduce the spread of invasive species spread via watercraft and trailers. Additional resources are needed to address accidental water garden releases, aquarium dumping, spiritual release, and illegal fish stocking.

Of the 51 known non-native aquatic species in Lake Champlain, about a dozen are classified as harmful AIS. Once AIS become established in Lake Champlain, they are difficult to effectively manage. Water chestnut management in Lake Champlain has been a success but requires consistent funding to reduce satellite populations and the main infestation in the South Lake to prevent the invasive plant from choking up the waterway and impeding boat traffic, reducing recreational opportunities. Significant resources are also expended managing the sea lamprey population to improve the health of the fishery in Lake Champlain. Increasing effort into education and outreach campaigns to ensure that they are multi-lingual and accessible to the entire Lake Champlain community will help reduce AIS introduction and spread.

MEASURES OF SUCCESS

Quantifying measures of success is critical to understanding the benefits of the LCBP's work and communicating progress toward the Healthy Ecosystems goal. Each strategy within the Healthy Ecosystems goal has metrics that measure progress toward implementation of this goal in Opportunities for Action. Key strategy-level metrics will be aggregated to provide a summary of implementation for the Healthy Ecosystems goal.

GOAL-LEVEL METRICS

- Number of projects supported and amount of funding allocated toward applied climate change, ecosystem management policy, lake food web dynamics, Species of Greatest Conservation Need (SGCN) fish community, or aquatic invasive species research with results provided to managers and stakeholders
- Area assessed or covered by plans funded by the LCBP
- Acres of land treated or improved for healthy soil function with soil best management practices
- Number of projects supported & amount of funding allocated toward the planning, design, and implementation of projects to improve, restore, and connect riparian corridors and floodplains, lake shorelands, wetlands, or habitat for rare, threatened, and endangered species.
- Population of the Lake Champlain Aquatic Nuisance Species Information System (LCANSIS) Database
- Number of watercraft decontamination stations active within the Basin
- Number of boater interactions at public launches completed by Boat Launch Stewards
- Number of aquatic invasive species interceptions completed by Boat Launch Stewards
- Percent of boaters taking spread prevention measures as documented by Boat Launch Stewards
- Implementation of an effective aquatic invasive species barrier on the Champlain Canal
- Lake area managed for aquatic invasive species

OBJECTIVES

Objective II.A

Support research and understanding of predicted impacts of a changing climate in the Lake Champlain Basin.

Strategy	Task Area	Metrics
II.A.1 – Fund and interpret climate change research.	**II.A.1.a – Support research and understanding of predicted impacts of a changing climate on the Basin including frequency of floods (lake levels), increased air and water temperatures, and changing land use on the lake's ecosystem.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated to support climate change research* • *Area assessed/covered by plan*
	II.A.1.b – Support research and understanding of AIS impacts to the Lake's ecosys-tem and economy under changing climate predictions.	
	II.A.1.c – Support identification of refugia sites for aquatic species of concern (adapt in place or move in space).	
	II.A.1.d – Study the impacts of climate on the lake trout population in the Basin.	
II.A.2 – Adapt to impacts caused by climate change.	**II.A.2.a – Support protection and restoration of healthy soils for ecosystem functions such as carbon sequestration, improved water quality and infiltration, and reduction of flooding impacts.**	• *Acres of land treated or improved (with soil BMPs)*

Objective II.B

Evaluate ecosystem management programs and policies (support research to assess success of current ecosystem management programs).

Strategy	Task Area	Metrics
II.B.1 – Support research to align policy with ecosystem management goals in the Basin.	**II.B.1.a – Assess state and local policies to identify those that align, contradict, or pose obstacles to healthy ecosystems goals.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated to support research that will inform ecosystem management policies*
	II.B.1.b – Conduct research to develop an improved understanding of the effects of funding cycles on the development of new management priorities (decision feedback loop).	

Strategy	Task Area	Metrics
II.B.2 – Fund research to evaluate ecosystem management programs.	**II.B.2.a – Fund and promote monitoring of restoration projects to determine long-term effects.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward evaluation of ecosystem management programs*

Objective II.C

Support conservation of habitat for ecosystem function.

Strategy	Task Area	Metrics
II.C.1 – Work with Lake Champlain management partners to prioritize, protect and restore important riparian, shoreland and wetland habitat areas.	**II.C.1.a – Fund and promote projects that protect and restore riparian corridors and floodplains.**	• *Number of habitat improvement projects supported for shorelands, riparian corridors, wetlands, and headwaters* • *Number of projects that address rare, threatened, and endangered species* • *Amount of funding allocated toward habitat improvement projects* • *Area or Length of lakeshore and riparian habitat restored* • *Lake and land area managed for invasive plants* • *Area of protected core habitat established in conservation easements or other land conservation vehicles*
	II.C.1.b – Fund and promote projects that protect and restore lake shorelands.	
	II.C.1.c – Fund and promote projects that protect and restore wetlands.	
	II.C.1.d – Fund and promote projects that protect and restore habitat for rare, threatened, and endangered species.	
	II.C.1.e – Fund and promote headwater connectivity by protecting amphibian hab-itat/upland streams, terrestrial connectivity, and natural infrastructure.	

Objective II.D

Preserve and enhance aquatic and riparian biological diversity.

Strategy	Task Area	Metrics
II.D.1 – Conduct research to improve our understanding of the functions and threats to the Lake Champlain ecosystem and develop and support programs that improve diversity of aquatic and riparian species in the Basin and work toward protection and restoration of native species.	**II.D.1.a – Fund and conduct research to better understand lake food web dynamics including for the improved understanding of lower to upper food web interactions and impacts of changing external and internal drivers for management decisions.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated to support ecosystem function and native species projects*

Strategy	Task Area	Metrics
II.D.1 *continued*	**II.D.1.b – Support state and provincial efforts to describe information gaps and assess the restoration needs for statutorily protected species or Species of Greatest Conservation Need (SGCN), such as lake trout and lake sturgeon, to in-form management restoration efforts.**	• *Number of assessments generated for Species of Greatest Conservation Need*
	II.D.1.c – Promote and support fish community research, including juvenile lake trout, brook trout, and landlocked Atlantic salmon, and management of sea lam-prey to enhance the fishery.	
II.D.2 – Reduce species fragmentation by preserving and connecting critical aquatic and riparian habitats.	**II.D.2.a – Fund projects that prioritize and/or reduce fragmentation created by infrastructure, such as roads, dams, and culverts for native species such as brook trout, Atlantic salmon, mudpuppies, and salamanders.**	• *Number of aquatic habitat improvement projects supported* • *Amount of funding allocated to support aquatic habitat improvement projects*

Objective II.E

Prevent the spread of aquatic invasive species.

Strategy	Task Area	Metrics
II.E.1 – Work with Lake Champlain management partners to monitor and respond to new aquatic species invasions via early detection and rapid response (EDRR) and to educate different stakeholders about how their behavior can affect the spread of AIS.	**II.E.1.a – Conduct and coordinate AIS monitoring and implement the Great Lakes and Lake Champlain Invasive Species Program (GLLCISP) which supports the early detec-tion of the spread of existing AIS to new bodies of water in the basin or new arrivals of AIS to Basin waters.**	• *Number of projects/responses supported with results provided to managers and stakeholders* • *Amount of funding allocated toward implementation* • *Populate a Lake Champlain ANS Information System database with AIS species profiles for Lake Champlain* • *Progress toward reducing the risk of AIS invasions to Lake Champlain via the Champlain and Chambly canal systems*
	II.E.1.b – Support and implement the Lake Champlain AIS Rapid Response Manage-ment Plan to respond to new AIS infestations and mobilize resources to prevent spread.	
	II.E.1.c – Maintain involvement in regional and national AIS programs, such as GLL-CISP, ANSTF and NEANS Panel.	

Strategy	Task Area	Metrics
II.E.2 – Work with Lake Champlain management partners to reduce the risk of AIS transport along pathways such as the Champlain and Chambly canal systems, overland transport on boats and trailers, illegal stocking and bait.	**II.E.2.a – Intercept AIS transportation on watercraft and equipment by expanding the Boat Launch Steward Program and decontamination station coverage.**	• *Number of AIS decontamination stations operating at Lake Champlain public boat launches* • *Number of boater interactions* • *Number of AIS interceptions* • *Percent of boaters taking spread prevention measures*
	II.E.2.b – Fund and support implementation of an AIS barrier on the Champlain and Chambly Canals to prevent further invasions from species from the Hudson, St. Lawrence, and Great Lakes systems.	
II.E.3 – Support and conduct AIS management and research in the Basin.	**II.E.3.a – Eliminate, reduce, contain, or prevent the expansion of AIS populations in the Basin, including water chestnut and sea lamprey in Lake Champlain, using control techniques such hand pulling, benthic barrier matting, suction harvesting, and pesticides.**	• *Number of applied research projects supported with results provided to managers and stakeholders* • *Amount of funding allocated toward projects that address AIS concerns* • *Lake and land area managed for invasive species*
	II.E.3.b – Research and remain connected to new and innovative research, spread prevention programs and control technologies capable of addressing real and poten-tial AIS species impacts, including sea lamprey, to the Lake Champlain ecosystem and fishery, human health, and the regional economy.	
II.E.4 – Work with Lake Champlain management partners to deliver and conduct multi-lingual AIS education and outreach behavior change campaigns targeted at the general public and water user groups.	**II.E.4 a – Fund, support, and develop multi-lingual AIS spread prevention initiatives that address pathways (water gardening, aquarium and spiritual releases, bait, etc.) and promote the national "Clean, Drain, and Dry" and "Stop Aquatic Hitchhikers" messaging program.**	• *Number of people engaged who demonstrate a minimum level of knowledge or attitude toward AIS spread prevention* • *Number of traditionally underserved community groups engaged with AIS messaging*

THRIVING COMMUNITIES

GOAL: Lake Champlain Basin communities have an appreciation and understanding of the Basin's rich natural and cultural resources, and have the capacity to implement actions that will result in sound stewardship of these resources while maintaining strong local economies.

Any measure of a sustainable watershed must include communities that are thriving in a way that is compatible with the protection of our natural and cultural resources. A community only thrives when there is a balance of careful stewardship of those resources and smart economic development. Sound social and economic objectives are cornerstones of natural resource management and sustainable development. While economic development is beyond the purview of the LCBP and *OFA,* the organization can support and inform efforts by the business community and industry to implement lake-friendly and culturally responsible practices that contribute to a stronger economy and a healthier Lake.

The LCBP has an array of tools to foster thriving communities. The Champlain Valley National Heritage Area Partnership is a National Park Service program that focuses on stewardship, education and interpretation of our region's rich history and culture, collaboration among New York, Vermont and Québec, and sustainable tourism from the mouth of the Richelieu River to the southern end of the Champlain Canal. The Champlain-Adirondack Biosphere Network encourages dialog among partners in the Basin and Adirondack Park. While these efforts are large in scale, the LCBP also promotes this networking and knowledge-sharing at the state, regional, and local levels. The strategies below lay out an approach to ensuring that successful efforts are recognized and shared.

ENGAGING AND SUPPORTING PARTNERS

The LCBP has supported partners and encouraged collaboration for more than 30 years. The Program has provided watershed efforts with support and trainings through its Organizational Support to Watershed Groups grant programs. The LCBP has provided forums for discussions on stewardship techniques among foresters, farmers, municipal and state officials, and landowners. School programs and outreach efforts strive to educate the public on how they can help address the issues facing Lake Champlain—and explain why the actions they take are in their best interest. The LCBP has illuminated the connection between a clean, sustainable environment and a vibrant, growing economy.

The LCBP *State of the Lake Report* condenses the outcomes of our partners' efforts every three years, and the LCBP annual report provides information on every project undertaken in the previous fiscal year. These documents allow residents and policy makers to understand our collective progress toward achieving OFA goals. As social and environmental issues evolve, so does the plan. In addition to continuing address the actions described above, the LCBP will work to strengthen technical outreach and training, support plans for pending climate migration, take actions to increase engagement with underserved communities, and better illustrate how investing in infrastructure can benefit us economically.

WATER-WISE ECONOMIC DEVELOPMENT

An important first step in linking the value of a clean lake to the regional economy is a comprehensive assessment of the value of ecosystem services and the direct financial benefit to the business community, including revenues from recreation and tourism. Working with the business community, including farmers and loggers, to implement lake-friendly practices—from minor adjustments in everyday operations to large-scale innovation—can help enhance the ecological and economic services provided by clean water. The LCBP has traditionally presented Farm Awards to agricultural producers who implement practices to protect water quality. Extending the awards program concept to other areas, including implementation of effective green stormwater infrastructure, will highlight businesses that adopt more water-wise practices and exhibit leadership.

The LCBP has provided leadership in the recent revival of the Champlain-Adirondack Biosphere program, which was dormant for 30 years. The Biosphere provides more opportunities for encouraging our municipalities and citizens to be careful stewards of our natural and cultural resources. It also provides a platform to encourage an exchange of ideas and practices from other biospheres from across the globe. The formation of the Champlain-Adirondack Biosphere Network (CABN) created a "network of networks" that better ties communities and organizations working toward the same sustainable goals for the environment and society. The LCBP will support this effort through leadership, staffing, and grants.

CULTURAL HERITAGE RESOURCES STEWARDSHIP

An appreciation of our natural and cultural heritage is critical in fostering an understanding of them; that ap-

Thriving communities provide recreation access for all community members. Photo: LCBP

preciation and understanding leads to stewardship. The Champlain Valley National Heritage Partnership (CVNHP) works on many fronts to preserve, interpret, and showcase this heritage, and as such the 2011 CVNHP Management Plan is integrated into OFA by reference. The CVNHP has made great strides in helping the public better understand the past and put those lessons to use today.

Each year, the CVNHP focuses on one of its interpretive themes: Making of Nations, Corridor of Commerce, and Conservation & Community. This annual approach encourages stakeholders to work together to collectively commemorate anniversaries, or mark special programs. In 2023, the CVNHP will focus on the bicentennial of the opening of the Champlain Canal as part of the Corridor of Commerce theme. Partners will mark this feat of engineering while providing information on the modern threats of invasive species using the waterway and colonizing Lake Champlain. In 2024, the CVNHP will focus on the Conservation & Community Interpretive Theme by highlighting the Champlain-Adirondack Biosphere. The 250th anniversary of the American Revolution will be the focal point of the Making of Nations theme from 2025-2027.

RECREATION

Whether hiking in the mountains, boating on Lake Champlain, or plunging into a favorite swimming hole, most people who recreate outdoors have a strong bond with our forests, lakes, and streams. Recreation provides significant health benefits while building an appreciation of our natural resources. The LCBP has long been a proponent of creating access to the Lake and its tributaries. The LCBP will continue to support sustainable recreation efforts, promote ethical use of our public lands and waters, and develop additional access to those recreation resources, while encouraging members of underserved communities to enjoy and learn about our renowned natural resources and recreation opportunities.

MEASURES OF SUCCESS

Assessing the outcomes or benefits of efforts to improve the health of communities in the context of societal changes is extraordinarily difficult. Metrics for progress for community-level characteristics like a strong sense of place, community pride, and environmental awareness are difficult to define and measure. The benefits of assisting partners with meeting coordination, public education efforts, and financial and technical support are indirect and often not immediate. Tangible on-the-ground environmental outcomes (phosphorus reductions, habitat improvement, etc.) of these initiatives are generally realized because of successful technical improvements. Long-term changes in water quality knowledge and behavioral changes at the community level are best evaluated with program-specific evaluations and broad-scale surveys (see Goal IV: Informed and Involved Public). While the LCBP will continue to identify opportunities to evaluate the impact of our programs on societal and ecosystem scales, some basic measures have been introduced to better understand the impact of the LCBP, CVNHP and CABN grants and programs.

GOAL-LEVEL METRICS:

- Annual number of meetings, technical trainings, and other outreach events supported through grants and technical support
- Number of participants in those funded gatherings
- Number of documented partnerships maintained per year (e.g. grant MOAs, committee membership, etc.)
- Number of grants awarded
- Total amount of funding provided
- Total amount of match generated by the funding provided
- Number of volunteers participating in LCBP-sponsored projects
- Total amount of volunteer hours contributed to LCBP or CVNHP projects
- Value of those volunteer hours (rates provided by Independent Sector)

OBJECTIVES

Objective III.A

Engage and support community and management partners.

Facilitate work and communication within and among local communities that further watershed protection and restoration efforts.

Strategy	Task Area	Metrics
III.A.1 – Support local watershed groups.	**III.A.1.a – Grant Programs** Provide funds for local watershed groups to implement projects.	• *Number of different watershed groups that successfully complete projects with LCBP funding* • *Number of technical support programs offered* • *Number of people in the Basin who receive technical support* • *Total funding leveraged (including match, over-match, and non-match eligible leveraged funds)*
	III.A.1.b – Technical Assistance Provide technical assistance through meetings, workshops, presentation, and training.	
	III.A.1.c – Targeted watershed capacity building Work with partners in priority watersheds (Missisquoi, St. Albans Bay, South Lake A and B) to provide technical support and capacity building.	
III.A.2 – Facilitate and coordinate public messaging with management partners.	**III.A.2.a – Annual Report of LCBP Activities** Publish report annually summarizing LCBP activities in the previous year.	• *Number of meetings coordinated with partners (excluding LCBP standing committee meetings)*
	III.A.2.b – Meeting Coordination Assist partners with coordination of public meetings to inform the public about new legislation, programs, and initiatives.	
	III.A.2.c – Public Feedback Strengthen the feedback loop between resource managers and community members. Ensure the managers are answering questions relevant to communities.	
III.A.3 – Enhance flood resilience and climate change adaptation in community planning and development.	**III.A.3.a – Fund and Promote** OutreachSupport and advise municipalities' efforts to educate residents about sound river/floodplain management and promote recreation opportunities.	• *Number of climate resilience and adaptation outreach tools developed* • *Number of outreach activities and trainings directed to new Basin residents*
	III.A.3.b – Plan for Climate MigrationExamine how Basin communities are likely to receive new climate migration residents and how this will affect the Basin as a whole.	

Strategy	Task Area	Metrics
III.A.4 – Serve as a conduit for information, build professional capacity among stakeholders, and foster strong working relationships among the partners of the LCBP and CVNHP, and Champlain-Adirondack Biosphere Network (CABN).	**III.A.4.a – Professional Development** Support professional development among CVNHP stakeholders, including hosting an annual heritage partnership conference.	• *Number of participants in the annual CVNHP Summit* • *Number of formal partnerships maintained (e.g. Steering Committee, CACs)* • *Number of technical training opportunities made available to municipalities, indigenous communities, and NGOs* • *Number of volunteers engaged in projects or programs*
	III.A.4.b – Promote Partnerships Encourage cooperation and enhance communication among partners within the CVNHP and CABN.	
	III.A.4.c – Technical Outreach Training Fund and promote technical training programs for technical and outreach staff working with stakeholders in the Basin.	
	III.A.4.d – Technical Issue Training Support seminars, workshops, and conferences to deliver technical information on topics such as BMPS, LID, stormwater management technologies, roads management, and adaptive management to municipal and state staff.	
	III.A.4.e – Eco-benefit Education Educate stakeholders on the benefits and outcomes of completed projects for water quality, to encourage local support for community-level investments in water quality projects that benefit the Lake.	
	III.A.4.f – Economic Analysis Conduct valuations of clean water and healthy watersheds to demonstrate the value of investing in watershed practices.	
III.A.5 - Support underserved communities and build diversity, equity, and inclusion principles into LCBP programming.	**III.A.5.a – Diversity Planning** Develop a long-term diversity, equity, inclusion plan to diversify the LCBP, including staff, committees, and opportunities among grants and education programs.	• *Number of projects engaging underserved communities* • *Number of new applications from groups representing underserved communities*
	III.a.5.b – Encourage Diversity Ensure that LCBP and CVNHP programs and grant opportunities are representative of the Basin and its residents, and that traditionally underserved communities are represented within committees of the Program.	

Objective III.B

Support water-wise economic development.

Support and inform business practices and economic development that promote clean water across multiple economic sectors.

Strategy	Task Area	Metrics
III.B.1 – Support business innovations that improve water quality.	**III.B.1.a – Business/Industry Education Outreach** Work with key partners to develop industry-specific outreach.	• *Number of businesses partnered with the LCBP*
	III.B.1.b – Innovation Development Provide support to local businesses to develop and showcase new and innovative practices that support clean water.	
III.B.2 – Support working landscapes that help protect water quality.	**III.B.2.a – Outreach Assistance to Agriculture** Support farmers' and foresters' efforts to share their water quality protection practices.	• *Number of farmer-to-farmer education or technical programs supported*
	III.B.2.b – Awards Program Continue and implement new programs that recognize effective practices to protect water quality with a focus on agriculture and community recognition.	
III.B.3 – Support implementation of green stormwater infrastructure (GSI).	**III.B.3.a – Awards/Recognition Program** Initiate a program that recognizes effective implementation of GSI.	• *Number of GSI projects supported with LCBP funds (corresponds with Clean Water goal)*
III.B.4 – Coordinate efforts among partners to promote the CVNHP and the Champlain-Adirondack Biosphere region as a world-class destination for heritage travelers.	**III.B.4.a – Promote CVNHP Themes** Develop and maintain a consistent regional brand related to the interpretive themes of the CVNHP.	• *Number of grants supporting the CVNHP annual interpretive theme* • *Number of multilingual materials developed* • *Number of grants supporting sustainable tourism in the CAB region*
	III.B.4.b – Web Promotion Use the CVNHP website to promote the region, including the Biosphere.	
	III.B.4.c – Bilingual Services Support the development of bilingual materials, interpretation, and services.	
	III.B.4.d – Welcoming Visitors Promote the CABN efforts to attract international travelers.	

Strategy	Task Area	Metrics
III.B.5 – Foster a sustainable relationship between people and the natural and cultural resources of the Biosphere and CVNHP.	**III.B.5.a – Energy Efficiency** Promote energy efficiency and resource conservation among CVNHP partners.	• *Number of collections grants awarded through the CVNHP that address energy efficiency in museums and interpretive centers in the CVNHP* • *Number of CABN meetings and events coordinated* • *Number of grants awarded that address United Nations sustainable development goals*
	III.B.5.b – Promote Sustainability Promote sustainable agriculture practices in the CVNHP and in the Biosphere.	
	III.B.c – CABN Coordination Fund and promote work CABN coordination efforts.	

Objective III.C

Support awareness and conservation of cultural heritage resources.

Increase understanding of the region's cultural and historical resources. Greater understanding leads to greater appreciation, which leads to enhanced stewardship of these resources.

Strategy	Task Area	Metrics
III.C.1— Build on existing knowledge, make new discoveries of the history, culture, and special resources of the CVNHP, and make this information accessible to all.	**III.C.1.a - Cultural Resource** Support Support research and interpretation of our past and the cultural heritage resources of the CVNHP.	• *Number of CVNHP grants awarded* • *Number of new interpretive displays and materials developed*
	III.C.1.b - Maintain Cultural Database Manage a comprehensive online heritage resource database.	
	III.C.1.c -Promote Ethnography Document cultural components of the region, including Abenaki, Mohegan, Mohawk, and Onita cultures, Franco-American culture, and new American communities to research, restore and maintain these cultural identities in the Basin and CVNHP region.	
III.C.2—Support the conservation of the historical, archeological, natural, and cultural resources of the CVNHP.	**III.C.2.a - Build Bridges Between History and Ecology** Utilize the heritage of the Basin to engage stakeholders and foster stewardship of the Basin's natural resources.	• *Number of grants awarded that conserve historical, archeological, natural, and cultural resources*
	III.C.2.b - Promote Resource Protection Develop and implement CVNHP cultural and natural heritage resource protection programs as identified in the CVNHP management plan.	

Strategy	Task Area	Metrics
III.C.2 *continued*	**III.C.2.c - Support the Underwater Preserve System** Support a lake-wide management strategy for underwater cultural heritage resources in the CVNHP.	

Objective III.D

Support Lake and Basin recreation.

Foster stewardship of the Basin's land and waters, and support local economies, by connecting individuals and communities to the landscape.

Strategy	Task Area	Metrics
III.D.1—Provide sustainable and accessible recreational opportunities for everyone within the CVNHP, with a focus on access for underserved communities.	**III.D.1.a - Sustainable Recreation** Support initiatives that promote sustainable recreational activities that feature the natural, cultural, and historical resources in the CVNHP, including Lake Champlain Bikeways and the Western New England Greenways.	• *Number of grants awarded that support sustainable recreation opportunities* • *Number of grants awarded that promote access for underserved communities*
	III.D.1.b - Promote Better Access Increase and improve public access opportunities to the waterbodies of the Basin and interconnected waterways of the CVNHP for diverse recreational activities.	
	III.D.1.c - Encourage Sustainable Recreation Practices Support a public information program that emphasizes recreational ethics, public safety, sustainable use, and stewardship of cultural and natural resources.	

INFORMED & INVOLVED PUBLIC

GOAL: Basin residents and visitors will understand and appreciate Lake Champlain Basin resources, and will possess a sense of personal responsibility that results in behavioral changes and actions to reduce pollution.

The future of the Lake Champlain Basin rests in the hands of its citizens and leaders. For this reason, public information and outreach efforts have been a core function of the LCBP's work since its establishment. Education and interpretation of cultural and natural heritage have been a central component of the Champlain Valley National Heritage Partnership's work since its inception in 2006.

The LCBP, the CVNHP, and its partners must continue and expand efforts to engage diverse audiences, including underserved communities, in protecting and appreciating the resources of the entire Basin. Ultimately, a public that understands the Basin's water quality and resource management problems, with possible solutions, can make informed choices about their role in the protection and restoration of the Lake. Informing the public about how to change personal and collective behaviors and providing opportunities to change those behaviors is critical.

FORMAL LEARNING

Developing this understanding and appreciation at an early age is critical in fostering stewardship of natural and cultural resources. Formal learning in the classroom and field studies that are structured around a curriculum that integrates effective pedagogy and high-quality watershed content equips young citizens to make informed choices about their personal actions exploring the watershed. It also creates a multiplier effect as they share information and values with their parents, families, and other community members.

The LCBP and partners work directly with students through classroom programs and providing first-hand stewardship opportunities, and by training and providing resources to K-12 educators. The Champlain Basin Education Initiative (CBEI), a consortium of environmental and place-based education groups, continues to be a leader in watershed education in the Lake Champlain Basin. Through the Watershed for Every Classroom (WEC) program and annual professional development workshops, CBEI offers rich learning opportunities to teachers so that they might be better equipped to offer them to their students. CBEI has incorporated cultural heritage topics into WEC and its other programs and will work to build this aspect of its offerings going forward.

Engaging students in lake science helps build their awareness and stewardship of the Lake. Photo: LCBP.

INFORMAL LEARNING

In addition to formal education efforts, the LCBP will continue to inspire and build awareness among all age groups of watershed issues through informal and less structured outreach. Central to this objective is the need to interpret scientific findings, technical information, and management efforts. The first step to connecting people to the resource and encouraging behavior change is making the science of lake issues understandable to all citizens.

A variety of techniques and forms of media—including face-to-face interpretation and development of exhibits and outreach materials in both print and electronic formats—help to achieve this objective. Mass media outlets such as television and radio can expand the reach of these messaging efforts to the 600,000 Basin residents. The effectiveness of these efforts is enhanced through collaboration with key partners who have similar communications goals and audiences, and who possess skill sets that complement LCBP work.

BEHAVIOR CHANGE AND ACTION

The most successful education and outreach efforts inspire and facilitate citizen action. By making information about lake-friendly products and practices available, and by supporting the efforts of local watershed organizations and other partners to involve the public in direct action, the LCBP can help promote positive stewardship behaviors. New technologies allow citizens to share information and values more quickly and easily than ever before. Employing these tools in social marketing efforts can help engender a shift in collective values around resource stewardship.

Much of the work toward these objectives is accomplished most effectively by local watershed and river groups as well as other nonprofits and communities. As such, support for these organizations is critical to fully implementing this plan. Local implementation grants fund a variety of outreach projects and remain a high priority in the annual budget process.

MEASURES OF SUCCESS

The ultimate outcome of education and outreach efforts is behavior change, but the on-the-ground impacts of specific projects that inform and involve the public can be difficult to determine. Once a program is delivered, the ability to follow up with participants or audiences is

limited, particularly over the long term. Some partners have begun to track participants' behavior change several months after programs, providing a model for short- and mid-term evaluation efforts in the future.

While program-specific evaluations capture participants' perceptions, immediate actions, and intentions for future behavior, lasting behavior change takes some time to occur. Surveys administered at three- to five-year intervals will help evaluate broad-scale, long-term behavior change and the effectiveness of the strategies and task areas below. Under contract with the LCBP, Lake Champlain Sea Grant has conducted a survey that will serve as a baseline for tracking the public's knowledge of watershed issues and engagement in stewardship activities. The survey was crafted to reflect on the work of the LCBP and its partners, and it will help guide future outreach efforts of these partners.

GOAL-LEVEL METRICS

- Number of education programs offered
- Number of teachers involved in programs and grants
- Number of students reached through those programs and grants
- Number of visitors at the LCBP Resource Room at ECHO
- Number of individuals reached through interpretive and education and outreach programs and presentations
- Number of visitors to LCBP web sites
- Number of volunteers participating in LCBP grant-funded education and outreach projects

OBJECTIVES

Objective IV.A

Enhance formal learning at all educational levels.

Provide Resources and opportunities for students to increase understanding of and appreciation for Basin resources, related threats, and priority actions needed to address them.

Strategy	Task Area	Metrics
IV.A.1 – Implement programs for K-12 students.	**IV.A.1.a – Fund, Promote, and Deliver School Programs** Deliver classroom instruction that increases knowledge of watershed science, recreation, and cultural heritage among K-12 students.	• *Number of students receiving watershed-focused instruction* • *Number of watershed science, recreation, and cultural programs delivered to K-12 schools* • *Number of community projects implemented*
	IV.A.1.b – Fund, Promote and Deliver Field Programs Conduct field-based instruction and activities that provide hands-on knowledge of watershed science, recreation, and cultural heritage among K-12 students.	
IV.A.2 – Maintain and expand digital/online tools and resources.	**IV.A.2.a – Web Outreach** Maintain and enhance web resources, update design and content of existing web sites to support digital classroom learning experiences.	• *Number of social media posts* • *Number of views on LCBP-hosted websites*
	IV.A.2.b – Social Media Amplify social media presence for education efforts.	

Strategy	Task Area	Metrics
IV.A.3 – Support professional development for teachers and educator networks.	**IV.A.3.a – Professional Development Trainings** Deliver, fund, and promote instruction in watershed content and pedagogy for K-12 teachers via CBEI and other workshops.	• *Number of teaching certificate hours awarded* • *Number of curricula developed*
	IV.A.3.b – Curriculum Development Deliver, fund, and promote resources and curriculum materials developed as part of CBEI workshops and WEC and partner programs	
IV.A.4 – Engage youth in watershed management and stewardship opportunities.	**IV.A.4.a – Community Service Projects with K-12 students** Fund and promote community service projects and mentorship programs focused on clean water and healthy ecosystems, with an emphasis on traditionally underserved communities.	• *Number of youths engaged outside of classroom learning* • *Number of youth programs implemented*
	IV.A.4.b Youth advisory committee. Develop and coordinate a group representing youth perspectives across the Basin.	
	IV.A.4.c: Youth engagement and exchange opportunities Fund and promote cultural exchanges and international scholarship programs.	
	IV.A.4.d – Summer Youth Programs Fund, promote, and deliver summer camp programs focused on hands-on water quality education and conservation practices.	

Objective IV.B

Build awareness of the Lake Champlain Basin through informal learning across all communities.

Develop among residents and visitors an understanding of and appreciation for natural and cultural resources, the related threats, and the priority actions needed to address them.

Strategy	Task Area	Metrics
IV.B.1 – Communicate watershed science and stewardship information for the public and stakeholders.	**IV.B.1.a – Report on Condition of the Lake** Publish the *State of the Lake and Ecosystem Indicators Report*	• *Number of teaching certificate hours awarded* • *Number of curricula developed*

Strategy	Task Area	Metrics
IV.B.1 *continued*	**IV.B.1.b –Interpretation** Develop wayside and interpretive exhibits, brochures, fact sheets, and other print materials that explain natural and cultural resources, including watershed issues and concepts and CVNHP interpretive themes.	
	IV.B.1.c – Direct Engagement Deliver face-to-face, small group, and interactive interpretation to the public.	
	IV.B.1.d – Public Presentations Deliver presentations and demonstrations to inform decision makers, foster public understanding, and inspire action.	
	IV.B.1.e – Web/Electronic Outreach Produce video and other dynamic media for LCBP websites and social media.	
	IV.B.1.f – Basin Data Sharing Tools Develop, support, and promote digital tools for sharing and interpreting Lake and Basin data, including dashboards, story maps, and portals.	
	IV.B.1.g – Print Publications Design and develop print materials to inform public of issues and progress made by stakeholders to address issues.	
	IV.B.1.h – Inclusive Outreach Develop targeted outreach and engagement strategies for underserved communities.	
	IV.B.1.i – Missisquoi Bay Phosphorus Reduction Support education and outreach programming in collaboration with the Missisquoi Bay Bi-National Phosphorus Reduction Task Force.	
	IV.B.1.j – Climate Resilience and Adaptation Deliver, fund, and promote education programs to communicate messaging about climate resilience and adaptation.	
	IV.B.1.k – Interpretation through the Arts Deliver, fund, and promote programs that use art to educate and interpret watershed issues.	

Objective IV.C

Facilitate changes in behavior and actions of individuals for their communities.

Develop programs that enable people to adopt behavioral changes that reflect a personal commitment to protecting and improving resources in the Basin.

Strategy	Task Area	Metrics
IV.C.1 – Promote individual stewardship action.	**IV.C.1.a – Volunteer Opportunities** Use web and social media channels to encourage action at home or with local organizations' volunteer programs.	• *Number of volunteers participating in LCBP or grant-funded programs or projects*
	IV.C.1.b – Outreach Materials Promote lake-friendly products and practices.	
IV.C.2 – Promote community stewardship action.	**IV.C.2.a – Social Marketing** Implement social marketing techniques to foster sharing of information and stewardship ethic.	• *Number of communities engaged in watershed programs (e.g. Raise the Blade campaign)* • *Number of participants in lake leadership programming* • *Number of participants in volunteer monitoring programs*
	IV.C.2.b – Media Competition Implement a photo/video contest with a content sharing mechanism.	
	IV.C.2.c – Leadership Recognition Develop a Lake Leaders program to promote individuals who take steps to improve the health of the Lake.	
	IV.C.2.d – Community-based Research Increase community science to engage and develop stewardship for the Basin.	
IV.C.3 – Assess changes in the public's knowledge and behavior.	**IV.C.3.a – Public Survey** Conduct long-term surveys to track long-term changes in the public's knowledge and behavior, and effectiveness of LCBP and partner outreach efforts.	• *Number of people demonstrating a minimum level of knowledge or attitude*

GLOSSARY & ABBREVIATIONS

GLOSSARY

A

Accepted Management Practice (AMP): an accepted practice or activity that reduces the amount of pollution entering a body of water.

Agrochemical: a chemical product used in agriculture. In most cases, agrochemical refers to pesticides including insecticides, herbicides, and fungicides.

Algae: an informal term for a diverse group of organisms including bacteria and aquatic plants that occur as single cells, colonies, or strands. Algae use carbon dioxide and nutrients such as nitrogen and phosphorus to make their own food through photosynthesis.

Algae bloom or algal bloom: a situation often caused by excess nutrients whereby some species of algae can grow and reproduce rapidly, often forming dense mats on the surface of the water. Algae blooms can cause unpleasant or harmful conditions for swimmers or boaters.

Aquatic: growing in, living in, or dependent upon water.

Aquatic organism passage: the removal of barriers to movement through and between bodies of water. This can include dam removal, road removal, or enlargement of culverts and gates to allow more natural flows through these barriers.

B

Basin: the surrounding land that drains into a water body. For Lake Champlain, the land that drains through the many rivers and their tributaries into the Lake itself.

Benthic zone: the ecological region at the lowest level of a body of water such as an ocean, lake, or stream.

Best management practice (BMP): a practice or activity that reduces the amount of pollution entering a body of water.

Biodiversity: the variety of plants and animals, their genetic variability, and their interrelationships and ecological processes, and the communities and landscapes in which they exist.

Biota: the animal or plant life of a region.

Buffer (zone or strip): protective land border that reduces runoff and nonpoint source pollution loading to critical habitats or water bodies; area created or sustained to lessen the negative effects of land development on animals and plants and their habitats.

C

Carbon sequestration: the process of capturing and storing atmospheric carbon dioxide. Sequestration reduces the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change.

Climate: the description of the long-term pattern of weather in a particular area.

Climate change: significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer.

Climate migration: the movement of people due to climate stressors such as changing rainfall, heavy flooding, storms, and sea level rise.

Community: in the context of ecology, a group of interacting plants and animals inhabiting a given area.

Concentration: the amount of a material dissolved in a solution.

Contaminant: a substance that is not naturally present in the environment or is present in amounts that can adversely affect the environment.

Contamination: in water resources, the impairment of water quality by waste to a degree that creates a hazard to public health or living resources through toxins or the spread of disease. Air and soil can also be contaminated in a comparable way.

Corridor: in the context of wildlife, a strip of habitat that joins two larger blocks of habitat that permits movement of wildlife during dispersal or migration, such as a wooded area along a river.

Cost-effective: in environmental policymaking, the lowest cost means achieving a pre-determined environmental objective. Costs include long-term, short-term, direct, and indirect costs to producers, society, and the environment.

Cost-share: a method for sharing installation costs for conservation practices, including BMPs, between a governmental body (federal, state, local) and a farmer or landowner/land user.

Criteria: a standard, rule, or test by which something can be judged; a measure of value.

Critical habitat: any area which has unique or fragile natural, historical, geological, archeological or wildlife value; areas which are essential to the conservation of an officially listed endangered or threatened species and which may require special management considerations or protection are also considered critical habitats.

Cultural heritage: historical and archaeological past reflected in existing culture.

Cultural heritage resources: the physical record and memory of the past.

Cyanobacteria (blue-green algae): a type of bacteria found in many lakes, ponds, and reservoirs that obtains energy through photosynthesis. Some cyanobacteria produce natural toxins.

Cyanobacteria bloom: a situation often caused by excess nutrients whereby cyanobacteria grow and reproduce rapidly, often forming dense mats on the surface of the water. Cyanobacteria blooms can cause unpleasant or harmful conditions for swimmers or boaters.

Cyanotoxins: toxins produced by cyanobacteria. Not all cy-

anobacteria blooms are harmful. A bloom can be harmful when the toxins (cyanotoxins) it produces reach concentrations that are dangerous to people, animals, and aquatic life.

D

Database: a collection of data arranged for ease and speed of retrieval.

Drainage basin: land area from which water flows into a river or lake, either from streams, groundwater, or surface runoff (see Basin or Watershed).

E

Easement: an agreement by which a landowner gives up or sells one of the rights on their property. For example, a landowner may donate a right of way to allow community members access to a river or lake.

Ecosystem: a group of plants and animals occurring together, and the physical environment with which they interact.

Ecosystem approach: a way of looking at socio-economic and environmental information based on the boundaries of ecosystems such as the Lake Champlain Basin, rather than based on town, city, county or other political boundaries.

Ecosystem-based approach: a management approach to making decisions based on the characteristics of the ecosystem in which a person or thing belongs. This concept takes into consideration interactions between the plants, animals and physical characteristics of the environment when making decisions about land use or living resource issues.

Ecosystem function: the biological, geochemical, and physical processes that take place or occur within an ecosystem.

Endangered species: a species in immediate danger of becoming extinct.

Emerging contaminants: chemicals that are not currently or have only recently been regulated and about which there are concerns regarding their impact on human or ecological health.

Erosion: the loosening and subsequent transport of soil away from its native site, or the wearing away of the land surface by running water, wind, ice, or gravity. Erosion often results from wind or the removal of vegetation.

F

Failing or faulty septic system: a septic system that releases untreated or inadequately treated wastewater to surface or groundwater by surfacing and overland flow of effluent or by subsurface percolation.

Fishery: the act, process, occupation, or season for taking fish.

Fish passageway: a structure that is built, installed, or established to help fish bypass impediments in a waterway.

Flood resilience: Being prepared, ready to respond, able to cope, and recover from a flood event.

Floodplain: an area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

Food web: the pattern of food consumption in a natural ecosystem. A food web is composed of many interconnecting food chains.

Fragmentation: in ecology, habitat fragmentation is a process by which large and contiguous habitats are divided into smaller, isolated patches of habitats.

G

Green Stormwater Infrastructure (GSI): a suite of systems and practices that restore and maintain natural hydrologic processes to reduce the volume and water quality impacts of stormwater runoff. Riparian buffers, green roofs, bioswales, cisterns, permeable pavements, and constructed wetlands are all examples of GSI.

Groundwater: the water present beneath Earth's surface in rock, soil, and the fractures of rock formations.

H

Habitat: the place where a particular type of plant or animal lives. An organism's habitat must provide all the basic requirements for life and should be free of harmful contaminants.

Habitat degradation: reduction of the quality of the environment in which an organism or biological population usually lives or grows.

Habitat restoration: the artificial manipulation of a habitat to restore it to its former condition.

Harmful algal bloom (HAB): algal bloom that may create conditions that are harmful to human health or the ecosystem by production of natural toxins or other means.

Headwaters: the source of a stream or river. Headwaters are located at the furthest point from where the water body empties or merges with another.

Hydrology: the study of the distribution and movement of water both on and below the Earth's surface, as well as the impact of human activity on water availability and conditions.

I

Indigenous peoples: inheritors and practitioners of unique cultures and ways of relating to people and the environment. Indigenous peoples have retained social, cultural, economic, and political characteristics that are distinct from those of the dominant societies in which they live.

Infrastructure: the basic physical and organizational structures and facilities (like buildings, roads, and power supplies) needed for the operation of a society or enterprise.

Interpretation: communication that uses direct experience and multimedia to educate and inform. Interpretation is often used in programs and exhibits at educational, natural, and recreational sites, such as museums, parks, and science centers.

Impervious surface: any hard surface that prevents or hinders the absorption of water into the soil, causes reduced quality of runoff water, or causes water to runoff in greater quantities or at greater flow rates than the natural surface.

Integrity: in the context of ecology, a structurally sound and fully functional ecosystem is one that is said to have "ecological integrity." Such an ecosystem is self-maintaining and resilient when disturbed.

Invertebrate: small organisms like worms and clams that do not have a backbone.

L

Load (also loading): the amount of a material entering a system from all sources over a given time interval. Local watershed: in this Plan, any watershed within a sub-basin of Lake Champlain.

M

Management (natural resources management): to make a conscious, deliberate decision on a course of action to conserve, protect, restore, enhance, or control natural resources, or to take no action.

Microplastics: fragments of any type of plastic less than 5 mm (0.20 in) in length, according to the U.S. National Oceanic and Atmospheric Administration (NOAA) and the European Chemicals Agency. Microplastics cause pollution by entering natural ecosystems from a wide variety of sources, including clothing, food packaging, and industrial processes.

Mitigation: actions taken to compensate for the negative effects of a particular project. Wetland mitigation usually takes the form of restoration or enhancement of a previously damaged wetland or creation of a new wetland.

N

Nature-based Infrastructure: natural systems or engineered systems that mimic natural processes built to minimize flooding, erosion, and runoff.

Non-native species: a species not present in the Lake Champlain Basin before European settlement.

Nonpoint source pollution: nutrients or toxic substances that enter water from dispersed and uncontrolled sites, rather than through pipes. Sources of nonpoint source pollution include runoff from agricultural lands, urban and forest land, and on-site sewage disposal.

Nuisance species: species that have adverse ecological or economic impacts or impede the use of Lake Champlain. May include native and non-native species.

Nutrient: a substance like phosphorus or nitrogen which nourishes life. These are essential chemicals needed by plants or animals for growth. If other physical and chemical conditions are appropriate, excessive amounts of nutrients can lead to degradation of water quality by promoting excessive growth, accumulation, and subsequent decay of plants and cyanobacteria.

Nutrient cycling: the system where energy and matter are transferred between living organisms and non-living parts of the environment. This occurs as animals and plants consume nutrients found in soil and water, and these nutrients are released back into the environment via death and decomposition.

Nutrient loading: the release, through human activities, of nitrogen, phosphorus, and other nutrients into the environment. Fertilizers from agriculture, phosphates from detergents, and sewage from urban development are examples of nutrients that can be loaded into aquatic systems.

Nutrient management: an integrated approach designed to maximize the efficient use of nutrients, particularly phosphorus which is found in animal manure and fertilizer.

P

Pathogens: organisms, usually viruses, bacteria, or fungi, capable of causing disease.

PAHs (polycyclic aromatic hydrocarbons): are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They are also produced when coal, oil, gas, wood, garbage and tobacco are burned. Exposure to some PAHs in the environment has been linked to harmful health effects in humans and animals.

PFAS (per- and polyfluoroalkyl substances): a class of synthetic chemical compounds used in industry and consumer products since the 1950's. Exposure to some PFAS in the environment has been linked to harmful health effects in humans and animals.

Phytoplankton: very small, free-floating plants found in water bodies.

Point source pollution: nutrients or toxic substances that enter a water body from a specific entry point, such as a pipe. For example, the discharge from a sewage treatment plant is point source pollution.

Pollutant: a substance that causes pollution.

Pollution: impairment of land, air or water quality caused by agricultural, domestic, or industrial waste that negatively impacts beneficial uses of the land, air or water, or the facilities that serve such beneficial uses.

Pollution prevention: any action such as the efficient use of raw materials, energy, and water that reduces or eliminates the creation of pollutants. In the Pollution Prevention Act, pollution prevention is defined as source reduction (see Source reduction).

Population: the number of inhabitants in a country or

region; in ecology, a population is a group of organisms of the same species living in a specified area and interbreeding.

Protection: Preservation of a parcel of land to reduce impacts of development or other human-based land uses or to prevent the degradation of water quality, a species, or habitat.

R

Rare species: a species not presently in danger, but of concern because of low numbers.

Refugia: habitats that convey resistance and/or resilience to natural communities affected by disturbances. Refugia can support an isolated or relict population of a once more widespread species.

Resilience: the ability of a system or community to resist damages, or the speed the system or community recovers after being disturbed.

Resource management: the management of natural resources such as land, water, soil, plants, and animals, with a focus on stewardship for both present and future generations.

Restoration: any action taken to repair, maintain, protect, and enhance the ecological integrity of the Basin.

Riparian (habitat or zone): habitat occurring along rivers, streams and creeks that provides for a high density, diversity and productivity of plant and animal species.

Runoff: water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.

S

Salinization: the process by which water-soluble salts accumulate in soil or water.

Sedimentation: the deposition or accumulation of sediment such as sand, silt, or clay.

Source reduction: any practice which reduces the amount of any hazardous substance, pollutant or contaminant entering wastewater. Source reduction decreases the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

Stakeholder: An individual, group or organization impacted by the outcome of a plan or project. In a watershed, stakeholders include members of the public, decision makers, and individuals or groups with a specific interest in how the watershed is managed.

Stewardship: the concept of responsible caretaking. Stewardship is based on the premise that managers of natural and cultural resources are responsible to future generations for their condition.

Stormwater runoff: precipitation running off saturated or frozen soils and impervious surfaces such as paved parking lots, streets, or roofs.

Stream equilibrium: a balancing process associated with interrelated stream physical adjustments that naturally maintain stream channels in their most efficient and least erosive form.

Sub-basin: a smaller drainage area within a large drainage basin, such as the Saranac River sub-basin of the Lake Champlain Basin. In this Plan, "sub-basin" refers to one of the 34 drainage areas (larger than 26 km2) to Lake Champlain.

T

Threatened species: a species with high possibility of becoming endangered in the near future (see Endangered species).

Tile drain: a network or system of underground pipes that siphon away excess water from the soil.

Total Maximum Daily Load (TMDL): the maximum amount (load) of a single pollutant from all contributing point and nonpoint sources that a water body can receive and still meet water quality standards, and an allocation of that amount of the pollutant's sources.

Toxic substance: any substance which upon exposure, ingestion, inhalation, or assimilation into any organism, causes death, disease, genetic mutations, physiological malfunctions, or physical deformation. Examples of toxic substances are cyanides, phenols, pesticides, and heavy metals.

Toxic: poisonous, carcinogenic, or otherwise directly harmful to life.

Tributary: a stream or river that flows into a larger stream or river or lake.

U

Underserved communities: populations that face barriers in accessing and using services and resources because of geographic location, income, racial and ethnic background, religion, sexual orientation, gender identity, or special needs such as language barriers, disabilities, citizenship, or age.

Urban runoff: stormwater from city streets and adjacent domestic or commercial properties that may carry pollutants of various kinds into the sewer systems and/or receiving waters.

V

Vector: in lake management, vectors are transfer mechanisms responsible for the introduction and spread of invasive species including transport by boats and trailers, dumping of live bait, and release from aquariums and private ponds.

W

Wastewater: used water that has been affected by domestic, industrial, or commercial use. Stormwater runoff can

also be considered wastewater, especially if directed to a wastewater treatment plant.

Watershed: the geographic reach within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

Watershed group: a citizen-based group interested in protecting a nearby waterway and its surrounding drainage area.

Watershed planning: cooperative local and regional land use planning that recognizes watershed boundaries rather than political boundaries and considers water resources management as the central planning objective.

Wetland restoration: any action that aids in preserving, repairing, maintaining, or enhancing wetlands (see Wetlands).

Wetlands: lands that are transitional between land and water where the water table is usually at or near the surface of the land. Wetlands are characterized by unique hydric soils and contain plant and animal communities adapted to aquatic or intermittently wet conditions. Swamps, bogs, wet meadows, and marshes are examples of wetlands. The boundary of Lake Champlain wetlands has been defined at 105 feet (31.1 meters) above mean sea level.

Wildlife: for the purposes of this Plan, the term "wildlife" includes any non-domesticated mammal, fish, bird, amphibian, reptile, mollusk, crustacean, arthropod, and other invertebrate or plant.

Z

Zooplankton: very small, free-floating animals found in water bodies.

ABBREVIATIONS

AIS: Aquatic Invasive Species

AMP: Accepted Management Practice

ANS: Aquatic Nuisance Species

ANSTF: Aquatic Nuisance Species Task Force

BIL: Bipartisan Infrastructure Bill

BMP: Best Management Practice

CAB: Champlain-Adirondack Biosphere

CABN: Champlain-Adirondack Biosphere Network

CAC: Citizens Advisory Committee

CBEI: Champlain Basin Education Initiative

COVID: Coronavirus Disease

CVNHP: Champlain Valley National Heritage Partnership

E&O: Education and Outreach

EDRR: Early Detection and Rapid Response

EPA: United States Environmental Protection Agency

FEMA: Federal Emergency Management Agency

FSA: Farm Services Agency

GLFC: Great Lakes Fishery Commission

GLLCISP: Great Lakes and Lake Champlain Invasive Species Program

GSI: Green Stormwater Infrastructure

HAB: Harmful Algal Bloom

HAPAC: Heritage Area Partnership Advisory Committee

HUD: United States Department of Housing and Urban Development

IJC: International Joint Commission

IRDA: Institut de research et de développement en agroenvironnment

LCANSIS: Lake Champlain Aquatic Nuisance Species Information System Database

LCBP: Lake Champlain Basin Program

LCRC: Lake Champlain Research Consortium

LID: Low Impact Development

MBRNHP: Marsh-Billings-Rockefeller National Historical Park

MOA: Memorandum of Agreement

MOU: Memorandum of Understanding

NEANS: Northeast Aquatic Nuisance Species

NGO: Non-Governmental Organization

NHA: National Heritage Area

NPS: National Park Service

NRCS: Natural Resources Conservation Service

NWS: National Weather Service

NYS: New York State

NYSDEC: New York State Department of Environmental Conservation

OFA: Opportunities for Action

OBVBM

PCBs: Polychlorinated Biphenyls

PFAS: Per- and Polyfluoroalkyl Substances

QC: Québec

QC MDDELCC: Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques du Québec/Ministry of Sustainable Development, Environment and the Fight against Climate Change of Québec

RAP: Required Agricultural Practices

RFP: Request for Proposals

SGCN: Species of Greatest Conservation Need

SUNY: State University of New York

TAC: Technical Advisory Committee

TMDL: Total Maximum Daily Load

UN: United Nations

USACE: United States Army Corps of Engineers

USDA: United States Department of Agriculture

USDOT: United States Department of Transportation

USEPA: United States Environmental Protection Agency

USFWS: United States Fish and Wildlife Service

USFS: United States Forest Service

USGS: United States Geological Survey

UVM: University of Vermont

VT: Vermont

VTANR: Vermont Agency of Natural Resources

VTDEC: Vermont Department of Environmental Conservation

WEC: Watershed for Every Classroom

WRDA: Water Resources Development Act

APPENDICES

Lake Champlain Basin Program Guiding Principles for Program Management

Approved: April 13, 2022

These guiding principles are intended to provide a framework for the proper and effective management of the Lake Champlain Basin Program (LCBP) and the Champlain Valley National Heritage Partnership (CVNHP). This document includes provisions relating to creation and development of the Program. In addition, this document addresses the roles and responsibilities of the Steering Committee and its Executive Committee, as well as several standing advisory committees, including the Technical, Education & Outreach, Heritage Area Program, and Citizen Advisory Committees. This document also outlines the roles of the Host Entity, the Program Director, and the staff of the Lake Champlain Basin Program and the Champlain Valley National Heritage Partnership. These guiding principles shall be adopted and periodically revised by the Steering Committee as needed and shall be reexamined in 2022 and every five years thereafter, unless deemed appropriate earlier. For purposes of this document, the Host Entity is the NEIWPCC[1].

[1] Following a rebrand in 2020, the New England Interstate Water Pollution Control Commission is known exclusively as NEIWPCC.

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Creation of the Lake Champlain Basin Program

On November 5, 1990, the ***Lake Champlain Special Designation Act*** was signed into law under Section 120 of the Clean Water Act. Sponsored by Senators Leahy and Jeffords from Vermont and Senators Moynihan and D'Amato from New York, this legislation designated Lake Champlain as a resource of national significance. The legislation authorized the assembly of the Lake Champlain Management Conference, a group organized and chaired by U.S. EPA Region I, and made up of federal, state, and local designees with expertise in various technical and policy areas. The goal was to bring together people with diverse interests in the Lake and to create a comprehensive plan for protecting the future of Lake Champlain and its surrounding watershed. The Act specifically required examination of water quality, fisheries, wildlife, recreational, and economic issues. The challenge has been both to identify particular problems requiring management action and to chart an integrated plan for the future of the Lake Champlain Basin. To address this challenge, the Special Designation Act established the Lake Champlain Basin Program and authorized funding support from the EPA to the States of Vermont and New York and NEIWPCC to implement that Lake Champlain Basin Program (LCBP).

The Lake Champlain Management Conference undertook a five-year program of resource evaluation and management plan development, culminating in the 1996 comprehensive management plan Opportunities for Action (OFA). The Lake Champlain Management Conference decided to assign oversight of the implementation work of the LCBP to the Lake Champlain Steering Committee, and identified the membership of the new Committee in the 1996 management plan.

Funding and Oversight of the LCBP

The Lake Champlain Steering Committee is comprised of a broad spectrum of representatives of government agencies with a stake in the basin and the non-governmental chairs of advisory groups representing citizen Lake users, scientists, and educators. The Lake Champlain Special Designation Act was reauthorized in 2002, with the ***Daniel Patrick Moynihan Lake Champlain Basin Program Act*** authorizing expenditures of up to $11 million in EPA funds per year to accomplish this goal [www.lcbp.org/PDFs/H.R.1070_LCBPAuthorization_2002.pdf]. Recent annual appropriations have averaged a little over $4 million, which support numerous LCBP programs and Lake Champlain Steering Committee priorities each fiscal year. In addition, the LCBP receives annual appropriations via the Great Lakes Fishery Commission (GLFC) and the National Park Service (NPS).

The Great Lakes Fishery Commission was established by the 1954 Convention on Great Lakes Fisheries to encourage cross-border collaborative management efforts to restore the fisheries of the Great Lakes, particularly for management of sea lamprey. The recognition of sea lamprey as a nuisance species in Lake Champlain opened an avenue for funding through the GLFC to support fisheries and water quality restoration work in Lake Champlain. The GLFC, the LCBP, and the U.S. Fish & Wildlife Service (USFWS) entered into a Memorandum of Understanding (MOU) on Native Species and Habitat Restoration and Water Quality Improvements in 2010. Approximately $3 million is currently appropriated via the GLFC toward Lake Champlain work annually, a reflection of Senator Leahy's commitment to improving the Lake Champlain ecosystem. Roughly one-third of this appropriation is available to LCBP to support watershed restoration work in Lake Champlain, with the balance directed toward sea lamprey management, fisheries research, and other habitat restoration work conducted by the US Fish and Wildlife Service and fisheries research at the University of Vermont.

The Champlain Valley National Heritage Partnership (CVNHP) was established in 2006 as a part of the National Heritage Area (NHA) programs to recognize the importance of the historical, cultural, and recreational resources of the region and to assist efforts to preserve, protect, and interpret those resources. The Lake Champlain Basin Program (LCBP) is the managing entity of the CVNHP. The LCBP coordinates its work with its official liaison to the National Park Service (NPS), the Marsh-Billings-Rockefeller National Historical Park (MBRNHP) located in Woodstock, Vermont. The purpose of the NHA also is to enhance the quality of the tourism economy and to encourage working partnerships among state, provincial, and local governments and non-profit organizations in New York, Québec, and Vermont. As a NHA with an approved management plan, the Champlain Valley National Heritage Partnership (CVNHP) is authorized to receive up to $1 million annually, and is typically appropriated $300,000 from the National Park Service (NPS). The funds are allocated annually from the U.S. Department of Interior budget, which is determined by the U.S. Congress.

During the past two decades, the LCBP has sponsored a great variety of research, monitoring, and grants to regional organizations to promote water quality programs and install projects to improve water quality. LCBP has provided more than $7 million to support over 1,000 small grants awarded to more than 600 local recipients to reduce pollution in the Lake, educate and involve the public, and gather and share information about Lake issues. The LCBP also has funded education, planning, demonstration, control, research, and monitoring projects to restore and protect water quality and the diverse natural and cultural resources of the Lake Champlain Basin.

As a partnership of provincial, state, interstate, and US federal agencies, the Lake Champlain Basin Program (LCBP) brings cross-boundary and multidisciplinary leadership experience to coordinating and implementing the plan. The LCBP works cooperatively with many partners to protect and enhance the environmental integrity and the social, cultural, and economic benefits of the Lake Champlain Basin. Lake Champlain Steering Committee membership from New York, Québec, and Vermont reflects each jurisdiction's commitment to the 2015 *Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain among The State of New York, The State of Vermont and the Government of Québec*. It is this MOU that also describes the role, goals, and eligible membership of the Lake Champlain Steering Committee. US federal agency participation in the Lake Champlain Steering Committee, as described in the 2015 MOU, reflects the federal commitments established in the *Special Designation Act of 1990* and the *Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002,* which have enabled substantial US federal funds to be appropriated to support the work of the LCBP. These funds are made available to the LCBP to support operations and tasks that are consistent with the federal authorizations.

In 1996, the Lake Champlain Basin Program adopted the first *Opportunities for Action: An evolving plan for the Lake Champlain basin*. The plan was the result of six years of work by more than 100 partners representing US federal, New York and Vermont state government, Quebec provincial government, local municipalities, academic institutions, and numerous watershed organizations. OFA has subsequently been updated in 2003, 2010, and in 2017. The 2017 update of OFA reflects four core goals: clean water, healthy ecosystems, thriving communities, and an informed and involved public.

In 1992, the Lake Champlain Management Conference selected NEIWPCC to host the newly formed LCBP. See Section 6, The Host Entity for more. The role of NEIWPCC was further codified in the Great Lakes and Lake Champlain Act of 2002 (Clean Water Act §120), in which NEIWPCC was named alongside the States of Vermont and New York as an entity authorized to receive support from the U.S. EPA to implement the LCBP.

Mission and Vision of the Lake Champlain Basin Program

The mission of the LCBP is to coordinate and support efforts that benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources by working in partnership with government agencies from New York, Vermont, and Québec, private organizations, local communities, and individual stakeholders.

These efforts are guided by OFA. The Lake Champlain Steering Committee and LCBP staff work with program partners, advisory committees, and local communities to implement this plan through a variety of federal, state, and local funds.

The Lake Champlain Steering Committee has identified key functions that must be accomplished to successfully implement the plan. These functions include the following:

COORDINATE PROGRAMS AND IMPLEMENTATION ACTIVITIES
Coordination among government agencies, regional and local governments, the public and private sectors, nonprofit organizations, residents, and visitors is critical to successful implementation of the plan. Coordination involves facilitating data management and information exchange, resource and data sharing, and improving efficiency among key partners while not duplicating programs or creating new layers of bureaucracy.

INFORM AND INVOLVE THE PUBLIC
Public information and involvement efforts are required for successful implementation of the plan. A public that understands the Basin's water quality and resource management issues can make informed choices about the long-term protection and restoration of the Lake. A commitment to lifelong education about Basin resources is needed to facilitate this process. Furthermore, involving the public in planning and implementation increases both the sphere of responsibility for action and support for recommended actions.

SUPPORT LOCAL LEVEL IMPLEMENTATION
Implementation at the local level is the cornerstone of successful plan implementation. Addressing pollution problems at the local level is important because those most affected by an issue are often best able to address that issue. Many communities have existing resources and organizations to help implement programs, but may lack technical expertise, adequate funding, or access to additional human and financial resources. Building local capacity for plan implementation requires strengthening technical assistance to community groups and may require additional financial support for local programs.

MEASURE AND MONITOR SUCCESS RELATIVE TO PLAN BENCHMARKS
A critical component of watershed planning is monitoring, which must accomplish two roles. First, it must be a source of information regarding the health of the Lake and Basin. Management capacity hinges on the availability and reliability of comprehensive monitoring of key ecosystem indicators. Second, monitoring must measure the success of management programs and ensure accountability to the public. Monitoring can help determine progress toward goals and whether or not priorities need to be adjusted.

CREATE LINKS WITH LEGISLATIVE BODIES

Successful plan implementation depends greatly on the ability to gain political support for recommended actions. A framework is needed to communicate needs and recommend actions concerning the Lake to legislative bodies who formulate federal, state, and local laws and appropriate funds to various programs.

CREATE LINKS WITH INTEREST GROUPS

Implementation of the recommended actions in the plan depends greatly on continued support from numerous individuals and groups. Decisions concerning the management of the resources in the Lake Champlain Basin should be made through a consensus-based, collaborative process that encourages the expression and understanding of diverse viewpoints. This process helps integrate economic and environmental goals into plan implementation and ensures that a focus on implementation at the local level is maintained.

CONDUCT RESEARCH

The plan identifies several areas in which research is needed. Research has been an important component of preparing and updating the plan and will continue to provide critical information as implementation evolves. Improved knowledge of the physical, chemical, biological, and social characteristics of the Lake and Basin will help resource managers make effective policy and management decisions in the future.

SECURE AND DIRECT FUNDING

The cost of implementing the plan is high, though not as high as the potential costs of failing to act. The ability to implement watershed programs rests heavily on the availability of and access to funding sources. A mechanism must be in place to seek public and private funding for program implementation as appropriate and to allocate resources to appropriate entities based upon recommended priorities. Refer to Strategies for Funding Implementation for a discussion of funding implementation efforts.

UPDATE PLAN RECOMMENDATIONS

Because environmental conditions in the Basin change over time and new technologies will be discovered, priorities for action in the plan may change. Some management programs may become more important, others less. The plan should be reviewed and updated periodically to reflect these changing conditions. Moreover, the Steering Committee periodically should identify new actions requiring implementation based on reports of emerging issues from advisory committees and the LCBP's adaptive management initiative.

ADVISE AND ENCOURAGE AGENCIES RESPONSIBLE FOR IMPLEMENTATION

As the plan evolves, various agencies will fulfill their responsibilities for implementing certain actions. Listed benchmarks provide gauges for monitoring success. Those

responsible for implementing actions must be encouraged to follow through with their commitments and reach these benchmarks. Regular reporting of accomplishments, presented with the plan on the LCBP website plan.lcbp.org will both document and communicate progress as it is achieved.

LCBP Operating Structure, Committees, Host Entity, and Staffing

Background

The US Environmental Protection Agency (USEPA), Great Lakes Fishery Commission (GLFC), and National Park Service (NPS) regularly enter into agreements with NEIWPCC, Vermont, and New York on behalf of the LCBP to implement tasks according to a single coordinated LCBP workplan approved by the Lake Champlain Steering Committee. Most tasks are implemented by LCBP staff who, as NEIWPCC employees, provide management and continuity through annual budget cycles and who coordinate the advisory committees and procedures involved in annual operations.

The Lake Champlain Steering Committee is responsible for approving all workplans supported with LCBP funds. Both States maintain Lake Champlain Coordinators, with LCBP funding, who ensure that implementation managed by the states reflects the intentions of the Lake Champlain Steering Committee. Other work in the U.S. sector of the watershed is funded by federal appropriations to other federally funded agencies and commissions. EPA, GLFC, and NPS annual appropriations reflect both the executive branch priority as a line in the President's budget and the Congressional commitment, through substantial and continuing Congressional support.

Work in the Canadian sector of the basin is funded by provincial appropriations in the Canadian Province of Québec. Led by the Québec Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Environment and the Fight against Climate Change), the highest priorities of *OFA* are reflected in annual provincial ministry action plans.

Many essential research, monitoring, and resource management endeavors are developed with common methodologies on each side of the border so that data may be shared, analyzed, and reported easily. The successful experience of one jurisdiction is regularly shared with neighboring jurisdictions, and replication often is successful. Cross-marketing of programs, initiatives, and events and collaborative planning efforts are characteristic of the working relationships maintained by Steering Committee members. See Figure A1 for an outline of the LCBP Operating Structure.

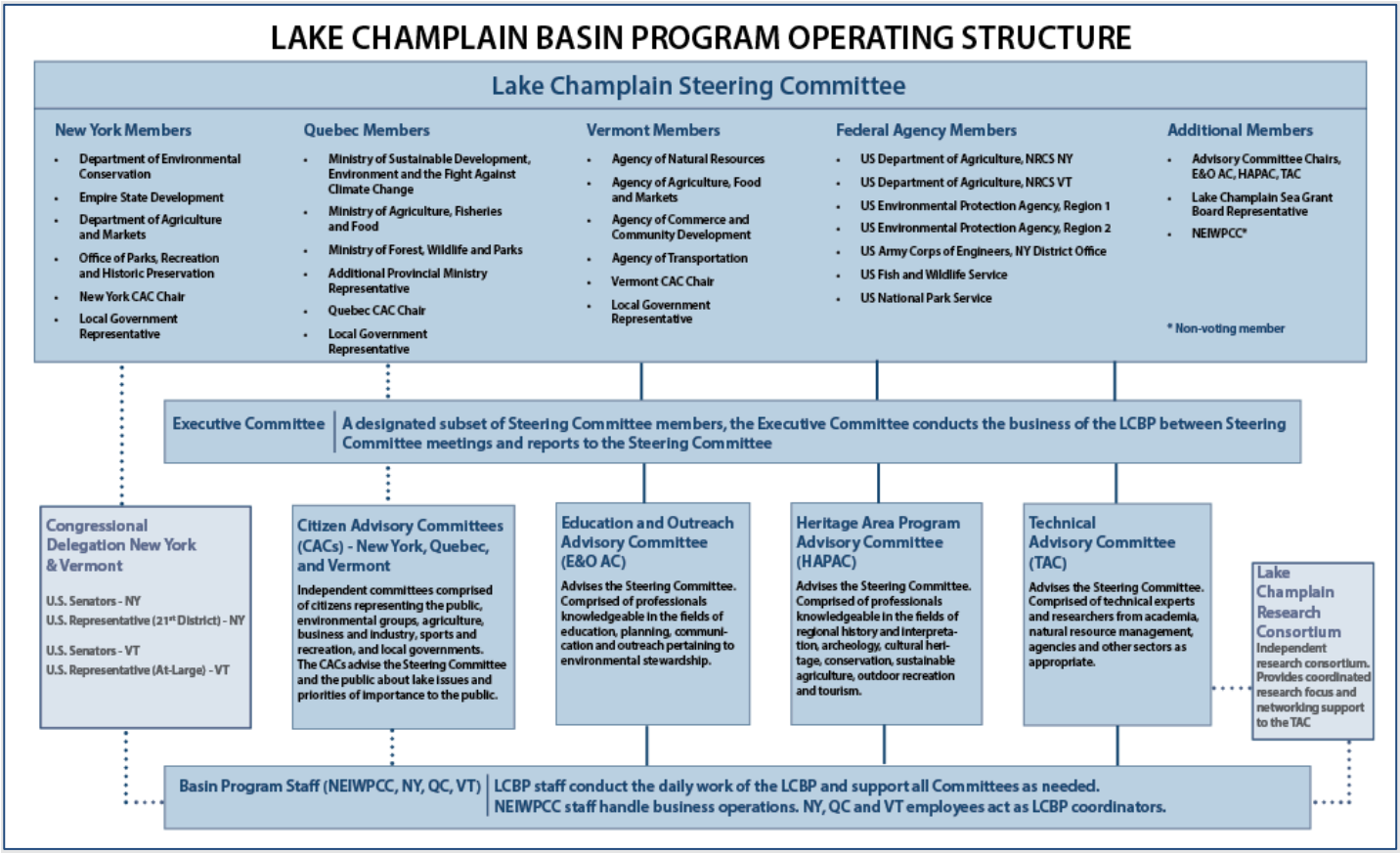

Figure A1. LCBP Operating Structure.

Lake Champlain Steering Committee

As affirmed through the *Memorandum of Understanding* signed by the Governors of New York and Vermont and the Premier of Québec in 2015, the Lake Champlain Steering Committee will continue its present role as a participatory forum in which key state, provincial, U.S. federal, and local leaders from New York, Québec, and Vermont can discuss issues of Lake Champlain and its watershed and coordinate policies and programs. As further codified by the *Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002* (U.S. Public Law 107-303), the LCBP is identified and authorized as the coordinated effort to implement *OFA*, with U.S. federal government participation and with federal funds.

Steering Committee Composition

The Steering Committee has been established to represent the wide range of state, local, federal and cross-jurisdictional interests and available resources in the basin to carry out OFA. Each (state and provincial) jurisdiction has identified its chief environmental delegate, who hosts and chairs Steering Committee meetings in rotation; this pattern contributes to cross-boundary coordination and teamwork. The states of New York and Vermont and the

province of Québec maintain the following (twenty-nine) partners on the Steering Committee to ensure a diversity of informed partners in the leadership of the LCBP.

Voting membership of the Lake Champlain Steering Committee includes:

- **Four New York State** agency representatives appointed by the governor: New York should consider the Department of Environmental Conservation (NYSDEC), Empire State Development (ESD), the Department of Agriculture and Markets (NYSDAM), and the Office of Parks, Recreation, and Historic Preservation (NYSOPRHP).

- **Four Vermont State** agency representatives appointed by the Governor: Vermont should consider the Agency of Natural Resources (VTANR), the Agency of Agriculture, Food, and Markets (VTAAFM), the Agency of Commerce and Community Development (VTACCD), and the Agency of Transportation (VTRANS).

- **Four Québec Provincial** representatives appointed by the Premier: Québec should consider three provincial representatives from the Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Environment and the Fight against climate change), Ministère Agriculture, Pêcheries et Alimentation du Québec (MAPAQ, Ministry of Agriculture, Fisheries, and Food of Québec), and Ministère des Forêts, de la Faune et des Parcs (QC MFFP, Ministry of Forest, Wildlife and Parks of Québec), and a fourth representative from provincial ministry leadership.

- **Three Local Government** representatives from municipalities in New York, Québec, and Vermont will ensure that Steering Committee decisions are well informed regarding local community interests. Local governments and the Steering Committee may nominate representatives to the Steering Committee. For New York and Vermont, the corresponding Jurisdictional chair may appoint the representative to the Steering Committee. For Quebec, the premier may make a corresponding appointment.

- **Three Citizen Advisory Committee** chairs are Steering Committee members, one each from New York, Québec, and Vermont.

- **Three Advisory Committee** chairs, from the Technical Advisory Committee (TAC), Education and Outreach Advisory Committee (E&O), and Heritage Area Partnership Advisory Committee (HAPAC), are Steering Committee members.

- **One Lake Champlain Sea Grant** representative may serve as a member of the Steering Committee.

- **Seven US Federal Agency** representatives serve on the Steering Committee. Represented in these positions are:

- the US Department of Agriculture Natural Resources Conservation Service, New York State Conservationist;
- the US Department of Agriculture Natural Resources Conservation Service, Vermont State Conservationist;
- the US Environmental Protection Agency Region 1;
- the US Environmental Protection Agency Region 2;
- the US Army Corps of Engineers, New York District Office;
- the US Department of the Interior – Fish and Wildlife Service; and
- the US Department of the Interior – National Park Service.

Members of the New York and Vermont congressional delegation staff are Steering Committee members who serve a non-voting liaison role. Similarly, the fiduciary agent for the Lake Champlain Basin Program serves as a non-voting member.

Changes to the Steering Committee Composition

The Lake Champlain Steering Committee may appoint new organizations to full membership in the Committee. Any changes to the composition of the Steering Committee shall be documented in the next subsequent revision of *Opportunities for Action*. The LCBP encourages participation from any organization regardless of formal voting membership on the Steering Committee. Eligible organizations to the Steering Committee are established by the most recent Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain between New York, Québec, and Vermont. The following procedure outlines the process for appointing new organizations to the Steering Committee:

Any interested, eligible organization (eligibility is determined in the most recent VT/NY/QC MOU) must submit a letter of interest to the LCBP/CVNHP Director. The letter should:

- state the mission of the organization and how this mission relates to the mission of the Lake Champlain Steering Committee and the LCBP/CVNHP.
- describe how the organization's membership on the Steering Committee would further the mission of the LCBP and its priorities identified in OFA.
- clearly document what resources the group can bring to the Steering Committee in the form of direct funding support for Lake Champlain projects and programs that support *Opportunities for Action*.
- demonstrate how their interests are not represented by the current membership of the Steering Committee and how a voting membership by the new organization would change representation of these interests.
- clearly identify the person or position (e.g. Director or Program Manager) within the organization who would be formally representing the organization on the Steering Committee.

The LCBP/CVNHP Director will discuss the letter with the interested organization, reviewing the mission of the LCBP/CVNHP, the role and charge of the Steering Committee, and any other relevant information at that time.

The LCBP/CVNHP Director will then circulate the letter of interest to the Lake Champlain Steering Committee, and will confer with the Chair of the Executive Committee and the three Chairs of the Steering Committee (New York, Québec, and Vermont MOU designees) to review and discuss the letter of interest during the next convenient Executive Committee agenda. The Chair of the Executive Committee may request that a representative of the interested organization attend the meeting to respond to questions. The Executive Committee may elect to discuss the letter in Executive Session, according to the open meeting laws established for the jurisdiction in which the meeting is occurring. The Executive Committee will discuss the merits of the requested membership and may then choose whether to nominate the interested organization for appointment to the Steering Committee by simple majority vote.

If the interested party is nominated for appointment to the Steering Committee, a representative(s) from the party will attend the next convenient Steering Committee meeting to inform the Committee about their organization, reason(s) for interest in joining the Committee, and resources their party can contribute to the group. The Steering Committee may then choose to appoint the organization to the Committee following the same procedures described for the Executive Committee nomination process. If the Committee agrees to add the interested organization to the membership, an appropriate representative(s) of the organization will be added to all appropriate distribution lists at that time and informed of upcoming meeting schedules and other obligations of membership to the Steering Committee.

Committee Operating Protocols

a) Steering Committee meetings are chaired by the member from the environmental agency of the jurisdiction hosting the meeting, QC MELCC, NYS DEC, or VT ANR.
b) All committees operate under the basic principles outlined in Robert's Rules of Order.
c) The Steering Committee conducts all meetings in compliance with the open meeting laws of the host jurisdiction (State or Province) while
    a. keeping meetings open and accessible to the public unless obligated to meet in executive session;
    b. meeting in executive session only when considering confidential matters limited to:
        - review of competitive bids and awards,
        - personnel discussions related to appointment to or removal from a LCBP committee,
        - discussions related to nomination of new members to the Steering Committee and Advisory Committees.
        - LCBP human resource matters,
        - matters that would, in any of the three jurisdictions, be required by law to be maintained in confidence.
    c. taking no formal actions while in executive session.

d. All formal actions or decisions by the Steering Committee and all other LCBP committees will be based on simple majority vote by the members participating in the meeting.

d) On a meeting-by-meeting basis, any Steering Committee member may, by written communication to the LCBP Director in advance of the meeting, designate another individual to participate in his or her stead at a Steering Committee meeting with proxy voting rights. Written proxy authorizations are maintained in the files of the LCBP.
e) No votes *in absentia* are permitted; members participating in real-time through conference call or other electronic or internet media sharing are considered present.
f) Steering Committee meeting draft agendas will be shared with all members, interested media, and members of the public at least one week prior to a regularly scheduled meeting.
g) Meeting minutes will be posted on the LCBP website within approximately one week of approval.
h) Committee members will be asked to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* (Appendix 1) to ensure close adherence to these guidelines during appropriate LCBP processes.

Steering Committee Charge

The charge of the Steering Committee includes:

a) Provide a forum for discussion of policies and issues of mutual concern.
b) Identify topics of mutual interest in which the exchange of information and coordinated actions will be beneficial.
c) Oversee the implementation of the Lake Champlain long-term management plan *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin* (*OFA*).
d) Identify key budget priorities annually to guide the early stages of draft budget development by LCBP committees and management, and identify additional resources necessary for plan implementation when possible.
e) Review the progress of cooperative efforts for management of Lake Champlain and make recommendations for future activities.
f) Seek the involvement of the public and appropriate academic institutions in the joint effort to guide management of the Lake.
g) Promote interaction and coordination among regulatory and management programs in the review of developments that affect the Lake.
h) Revise and update *OFA* on a five-year schedule.
i) Negotiate partnerships and commitments among agencies and groups to further the implementation of *OFA*.
j) Meet at least two times each year to facilitate communication and coordination among key partners working to implement *OFA*.
k) Monitor and evaluate progress against plan benchmarks and communicate that information by periodically producing an annual implementation status report and other education and outreach tools.

l) Select contractors and grant recipients for competed funds and approve Records of Decision as appropriate.
m) Charge the Executive Committee and advisory committees with tasks as appropriate and form *ad hoc* subcommittees for special tasks as needed.
n) Appoint chairs and members of the TAC, E&O, and HAPAC based, where possible, on nominations recommended by the Executive Committee and forwarded by its Chair. Steering Committee will carefully consider individuals for chair positions to ensure impartial representation.
o) Oversee the coordination of cultural heritage and recreational resource enhancement and stewardship programs of the Champlain Valley National Heritage Partnership.
p) Make adjustments in the composition of the Steering Committee as needed to achieve the goals of the plan.
q) Provide assistance to NEIWPCC on the hiring process for the LCBP and CVNHP Director (see **LCBP Staff Management and recruitment processes**, below, for more details on this process).

Executive Committee

To increase its effectiveness, the Steering Committee has assigned eleven of its members to comprise an Executive Committee to meet four to eight times per year between Steering Committee meetings to conduct LCBP business on behalf of the Steering Committee. New York, Vermont, and the US Environmental Protection Agency (USEPA) share chairmanship of the Executive Committee in a two-year rotation; this pattern contributes to stability in operational guidance of the LCBP, with appropriate leadership duties provided by the jurisdictions in which the LCBP is principally funded and in which the office is located.

Executive Committee Membership

The Executive Committee includes Steering Committee representatives of the New York State Department of Environmental Conservation, Québec Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Environment and the fight against climate change), Vermont Agency of Natural Resources, USEPA Region 1, USEPA Region 2, and the chairs of the six advisory committees (New York, Québec, and Vermont Citizen Advisory Committees (CACs), Technical Advisory Committee (TAC), Education and Outreach Advisory Committee (E&O), and Heritage Area Partnership Advisory Committees (HAPAC)). These eleven members make up the regular voting membership of the Executive Committee. However, any Steering Committee member may participate in any Executive Committee meeting with the option of voting if present. Executive Committee meeting draft agendas are distributed to the full Steering Committee one week in advance of meetings. Executive Committee members may designate a proxy to serve in their capacity. Designations must be submitted in writing to the LCBP/CVNHP Program Director.

Executive Committee Charge

a) Meet regularly to guide the work of the LCBP between Steering Committee meetings and provide interpretation of the intent of the Steering Committee to the LCBP management.
b) Receive its charge for special tasks from the Steering Committee and report its actions to the Steering Committee, which has final authority on all LCBP policy matters. The Executive Committee is normally delegated to act between Steering Committee meetings with the full authority of the Steering Committee, and subject to Steering Committee guidance.
c) Prepare the draft LCBP budget each fall based on task proposals recommended by LCBP management, and the chairs of TAC, E&O, and HAPAC. The Executive Committee Chair presents the recommended draft budget to the Steering Committee each winter for Steering Committee review, adjustment, and approval.
d) Nominate chairs and members of the TAC, E&O, and HAPAC, based on recommendations from Steering Committee members and LCBP staff. The Executive Committee is the sole source of advisory committee nominations eligible for consideration and appointment by the Steering Committee. See below on CAC appointments.
e) Consider potential contractors and grant recipients for competed funds based on LCBP staff reports of the competitive review processes and approve awards through **Records of Decision** as appropriate.
f) Adhere to the meeting protocols applicable to Steering Committee meetings.

Citizen Advisory Committees (CACs)

The New York, Québec, and Vermont CACs serve as important liaisons to the public. As positions become available on the CACs, the states and province ensure that representatives from environmental groups, agriculture, business and industry, sports and recreation, and local governments are included to the extent practicable.

CAC Membership

Stakeholder groups may nominate representatives, and the persons or agencies in New York, Québec, and Vermont who have the authority to appoint CAC representatives should include those nominees in the pool considered for appointment. NY CAC appointments are made by the Commissioner of NYS DEC; VT CAC appointments are made by the Governor, and Quebec CAC appointments are made by the Minister of Environment. All members of the CACs serve up to three-year appointments that are renewable. The CACs elect their chairs, who serve as voting members of the Steering and Executive Committees.

The Role of the CACs

a) Inform and involve the public on issues concerning the Lake and the Basin.
b) Provide a regular forum for interest groups and local governments to discuss the issues facing the Lake and the Basin.
c) Advise the Steering Committee about public concerns and interests.
d) Provide a link between the Steering Committee and LCBP staff and governmental bodies and groups implementing the plan at the local level.

e) Provide recommendations to the Steering Committee about evolving plan priorities.
f) Advise and encourage agencies responsible for implementing plan actions to follow through with their commitments, for example, by presenting an annual report of recommendations to the legislatures.
g) Participate in review panels for LCBP grant programs as requested.
h) Host public meetings for information exchange regarding plan implementation.

Technical Advisory Committee (TAC)

The Steering Committee appoints (for staggered three-year terms that are renewable), a Technical Advisory Committee comprised of professionals from academia, natural resource management agencies, and other sectors as it deems appropriate.

TAC Membership

TAC is comprised of five jurisdictional members and additional members-at-large appointed to three-year terms that are renewable.

a) Five jurisdictional members: one technical expert each from: New York State Department of Environmental Conservation, Québec Ministère de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Environment and the fight against climate change), and Vermont Agency of Natural Resources, will be appointed by their respective jurisdictions to provide both objective technical and scientific expertise *and* representation of their respective jurisdictional perspectives on technical issues. These three memberships have voting capacity. In addition, U.S. Environmental Protection Agency Regions 1 and 2 each are represented on TAC, with nonvoting status, so that technical expertise from the primary funding agency is available in TAC discussions.

b) All other TAC members are members-at-large. Members-at-large are appointed by the Steering Committee solely based on their technical and scientific expertise, in order to provide objective technical and scientific expertise needed by the TAC, but ***not*** to represent institutional or jurisdictional entities. No attempt is made to provide specific stakeholder representation on TAC, but balance of representation from jurisdictional areas may be considered. TAC members serve at the pleasure of the Steering Committee for three-year, renewable terms. Membership renewal is discussed with each individual member, the Chair of the TAC, the LCBP Technical Coordinator, and the LCBP/CVNHP Director. The LCBP/CVNHP Director has the authority to renew membership. The Chair of the TAC also is appointed by the Steering Committee and serves as a voting member of the Steering and Executive Committees.

The Role of the TAC

The role of the TAC includes the following:

a) Present the Steering Committee and LCBP staff with objective information to be used in the decision-making process as requested, including:
   i. emerging technical and scientific management issues,
   ii. the necessary research or actions to address those issues, and
   iii. draft task descriptions and funding recommendations.

b) Provide professional review of proposals for LCBP-funded technical and scientific studies and projects, as requested.
c) Evaluate interim and final products and reports for LCBP-funded technical and scientific studies and projects, as requested.
d) TAC meetings are open and accessible to the public except when TAC is obliged to meet in closed executive session.
    i. TAC will meet in closed executive session only when considering confidential matters limited to:
        a. review of competitive bids and awards,
        b. review of interim or final report drafts submitted to the LCBP by a subrecipient (contractor or subaward).
    ii. TAC will take no formal actions while in closed session.
e) On a meeting-by-meeting basis, any TAC member may, by written communication to the LCBP Director in advance of the meeting, designate another individual to participate in his or her stead at a TAC meeting with proxy voting rights. Proxy authorizations are noted in TAC meeting summaries.
f) No votes *in absentia* are permitted; members participating in real-time through conference call or other electronic or internet media sharing are considered present.
g) Committee members will be expected to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* (Appendix 1) to ensure close adherence to these guidelines during appropriate LCBP processes.

As organizations and partnerships established independently of the LCBP continue to address technical issues in the Basin and function in their own right, they also may provide important input to the TAC. These organizations include the Lake Champlain Fish and Wildlife Management Cooperative, the Aquatic Invasive Species Rapid Response Task Force, the Lake Champlain Research Consortium, Lake Champlain Sea Grant, and several other groups and partnerships.

Heritage Area Partnership Advisory Committee (HAPAC)

The Steering Committee appoints the Heritage Area Program Advisory Committee to provide advice concerning the implementation priorities for the *Champlain Valley National Heritage Partnership Management Plan*.

HAPAC Membership

HAPAC is composed of professionals from public and private sectors knowledgeable in fields that address regional history, historical interpretation, archeology, cultural heritage, conservation, sustainable agriculture, outdoor recreation, and tourism. HAPAC appointments are made solely on the basis of professional expertise in order to provide objective guidance needed by the LCBP, but not to represent institutional or jurisdictional entities. HAPAC members serve 3-year, renewable terms. No attempt is made to provide stakeholder representation on HAPAC. HAPAC members serve at the discretion of the Steering Committee. Membership renewal is discussed with each individual member, the

Chair of the HAPAC, the LCBP Cultural Heritage and Recreation Coordinator, and the LCBP/CVNHP Director. The LCBP/CVNHP Director has the authority to renew membership. The chair of the HAPAC, appointed by the Steering Committee, serves as a voting member of the Steering and Executive Committees.

The Role of the HAPAC

The role of the HAPAC includes the following:

a) Present the Steering Committee and LCBP staff with objective information to be used in the decision-making process as requested, including:
   i. emerging heritage resource management issues,
   ii. the necessary research or actions to address those issues, and
   iii. draft task descriptions and funding recommendations.
b) Provide professional review of proposals for LCBP-funded heritage-related implementation tasks as requested.
c) Evaluate interim and final products and reports for LCBP-funded heritage-related studies and projects as requested.
d) Advise the Steering Committee and staff regarding opportunities for trans-boundary partnerships, key partnerships, and cooperative projects both within the Champlain Valley National Heritage Partnership and adjacent areas.
e) HAPAC meetings are open and accessible to the public except when HAPAC is obliged to meet in closed executive session.
   i. HAPAC will meet in closed executive session only when considering confidential matters limited to:
      a. review of competitive bids and awards,
      b. review of report drafts submitted to the LCBP by a subrecipient (contractor or subaward).
   ii. HAPAC will take no formal actions while in closed session.
f) On a meeting-by-meeting basis, any HAPAC member may, by written communication to the LCBP Director in advance of the meeting, designate another individual to participate in his or her stead at a HAPAC meeting with proxy voting rights. Proxy authorizations are noted in HAPAC meeting summaries.
g) No votes *in absentia* are permitted; members participating in real-time through conference call or other electronic or internet media sharing are considered present.
h) Committee members will be asked to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* (Appendix 1) to ensure close adherence to these guidelines during appropriate LCBP processes.

As organizations and partnerships established independently of the LCBP to address cultural heritage and recreational issues in the Basin continue to function independently,

they may also provide input to the HAPAC. These organizations include the regional marketing organizations and chambers of commerce, scenic byways programs, cultural heritage tourism initiatives, arts councils in both states, and several other groups and partnerships.

Education and Outreach Advisory Committee (E&O)

The Steering Committee will appoint an E&O Advisory Committee comprised of professionals from educational institutions and organizations in the Basin and with representation from the CACs and other appropriate sectors.

E&O Committee Membership

The E&O Committee is composed of professionals from public and private sectors knowledgeable in fields that include education, public information technology, electronic and broadcast media, and outreach pertaining to environmental stewardship and related topics of the plan. The E&O members serve at the discretion of the Steering Committee. E&O appointments are made solely on the basis of professional expertise in order to provide objective guidance needed by the LCBP, but not to represent institutional or jurisdictional entities. No attempt is made to provide stakeholder representation on E&O. E&O members serve for three-year terms that are renewable. Membership renewal is discussed with each individual member, the Chair of the E&O Committee, the LCBP Education and Outreach Coordinator, and the LCBP/CVNHP Director. The LCBP/CVNHP Director has the authority to renew membership. The chair of the E&O Committee, appointed by the Steering Committee, serves as a voting member of the Steering and Executive Committees.

The Role of the E&O Committee

The role of the E&O Committee includes the following:

a) Present the Steering Committee and LCBP staff with objective information to be used in the decision-making process as requested, including:
   i. emerging educational and outreach opportunities and issues,
   ii. the necessary programmatic actions to address those issues, and
   iii. draft task descriptions and funding recommendations.
b) Provide professional review of proposals for LCBP-funded education and outreach implementation tasks, as requested.
c) Evaluate interim and final products and reports for LCBP-funded education and outreach tasks, as requested.
d) Advise the Steering Committee and staff regarding opportunities for trans-boundary partnerships, key partnerships, and cooperative projects to enhance education and outreach program effectiveness.

e) Advise the Steering Committee and staff regarding opportunities for the application of multimedia and multimodal technical tools to enhance education and outreach program effectiveness.
f) E&O meetings are open and accessible to the public except when E&O is obliged to meet in closed executive session.
    i. E&O will meet in closed executive session only when considering confidential matters limited to:
        a. review of competitive bids and awards,
        b. review of reports drafts submitted to the LCBP by a subrecipient (contractor or subaward).
    ii. E&O will take no formal actions while in closed session.
g) On a meeting-by-meeting basis, any E&O member may, by written communication to the LCBP Director in advance of the meeting, designate another individual to participate in his or her stead at an E&O meeting with proxy voting rights. Proxy authorizations are noted in E&O meeting summaries.
h) No votes *in absentia* are permitted; members participating in real-time through conference call or other electronic or internet media sharing are considered present.
i) Committee members will be asked to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* (Appendix 1) to ensure close adherence to these guidelines during appropriate LCBP processes

Subcommittees and Ad Hoc Committees

As deemed necessary, the Steering Committee may establish and populate additional subcommittees or ad hoc committees where membership may include Committee members as well as non-members. The Steering Committee may assign the LCBP Director the responsibility of identifying appropriate membership for ad hoc subcommittees. All subcommittees will operate according to the roles and responsibilities established for the standing committees, as outlined above. The role of subcommittee chairs in reporting to the Steering Committee shall be determined by the Steering Committee upon the creation of each subcommittee. Subcommittee chairs may report directly to the Steering or Executive Committee, to another standing subcommittee, or to the LCBP/CVNHP Director.

The Host Entity

In 1992, the Lake Champlain Management Conference selected NEIWPCC to receive LCBP funding to serve as the Host Entity for the LCBP. NEIWPCC is a regional commission that helps the states of the Northeast preserve and advance water quality. Established in 1947 by the U.S. Congress, NEIWPCC engages and convenes water quality professionals and other interested parties from New England and New York to collaborate on water, wastewater, and environmental science challenges across shared regions, ecosystems, and

areas of expertise. NEIWPCC's executive committee and commissioners (gubernatorial appointees from each of its member states[2]) set the goals and priorities implemented by the Executive Director and the staff. NEIWPCC is committed to fostering, cultivating, and preserving a culture of diversity, equity and inclusion, and it is an organization comprised of many people with diverse backgrounds, education, experiences and ideas who come together and strive to make NEIWPCC's vision a reality: Clean and Sustainable Water throughout the Northeast. NEIWPCC has its headquarters in Lowell, Massachusetts, with various satellite offices throughout the region.

The Host Entity, in conjunction with the Program Director, is required to regularly report to EPA, GLFC, NPS, and other funding sources on the deliverables, outputs, outcomes, and financials in response to guidance and requirements.

The Role of the Host Entity

In accordance with NEIWPCC's annual work tasks for LCBP approved by the Lake Champlain Steering Committee, and the award workplans approved by the EPA, GLFC, and NPS, NEIWPCC's role as Host Entity is to:

- Assist and support the LCBP in implementing OFA.
- Provide programmatic advice; hire and supervise staff; manage subawards and contracts; and provide administrative, financial, and human resources support.
- Provide direction to the LCBP and the work of its staff.
    - Provide input to and oversight of the annual work plans and related program resource allocations in coordination with the Steering Committee and LCBP/CVNHP Program Director.
    - Contribute to and review technical and communications products to ensure appropriate deliverables.
    - Provide direction to the LCBP Program Director in consultation with the Lake Champlain Steering Committee.
    - Evaluate the LCBP's administrative structure and relationship in consultation with the Lake Champlain Steering Committee when necessary.
- Participate in the Lake Champlain Steering Committee as a non-voting member.

Collectively, specific tasks of NEIWPCC Lowell staff include, but are not limited to:

- Supervision of NEIWPCC-LCBP employees.
    - Supervise LCBP/CVNHP Program Director.
    - Communicate with the LCBP Program Director on a regular basis.

[2] Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont

    - Evaluate the job performance of the LCBP Program Director. After developing a process in conjunction with NEIWPCC's human resources team, NEIWPCC will consult with the current Executive Committee Chair for feedback on the performance of the LCBP/CVNHP Program Director during the applicable review period. The Executive Committee chair may elect to coordinate feedback from the Steering Committee membership.
    - Consult with the LCBP Program Director to evaluate the job performance of other LCBP staff.
    - Assist in other LCBP staff performance appraisals.
    - Approve timesheets, expense vouchers, and requests for leave.
- Programmatic
    - Develop work plans and budgets for each annual funding source (EPA, GLFC, NPS, and others); coordinate same with LCBP Program Director.
    - Review and finalize quarterly progress reports provided by the LCBP Program Director that describe LCBP activities and outputs. Submit reports to appropriate funding source.
    - Jointly with LCBP Program Director and the Lake Champlain Steering Committee, ensure projects address priority topics outlined in OFA and support the mission of protecting and preserving Lake Champlain and its watershed through partnerships that conserve and restore natural resources, enhance water quality and promote community involvement.
    - Coordinate match documentation required to be eligible for funding from the EPA, NPS, and other funding sources as needed
    - Engage in program development.
- Interfacing with EPA Region 1, the Great Lakes Fishery Commission, the National Park Service, and other funding sources (as the grant recipient)
    - Prepare grant applications to funding sources
    - Accept and administer the annual federal grants for LCBP/CVNHP funding.
    - Communicate with EPA Project Officer and other funding agents on a regular basis.
    - Meet with EPA Project Officer annually to coordinate issues between NEIWPCC/LCBP, the states, and EPA Regions 1 and 2.
    - Prepare required application, narrative and financial reports, and progress reports.
- Human resources support
    - Lead hiring process for staff positions: draft job descriptions, advertise the positions; collect and review all resumes and field all employment questions; coordinate and schedule interviews; conduct interviews and select the ideal candidate (in cooperation with search committees, as appropriate); conduct reference checks and offer employment; and conduct any other aspects of the

hiring process. Work collaboratively with the LCBP Program Director (or appropriate LCBP staff) throughout the process.

- For the LCBP/CVNHP Program Director position, NEIWPCC will consult with the current Chair of the Lake Champlain Executive Committee throughout the hiring process. The hiring committee, led by a NEIWPCC Human Resources designee, will be developed through consultation with the current Chair of the Lake Champlain Executive Committee. The EPA and NPS will have representation on the hiring committee; NEIWPCC and the Chair of the Executive Committee will be responsible for coordinating a maximum of two additional remaining representatives of the Steering Committee. The Position Description will be developed by the NEIWPCC HR designee in consultation with the other members of the hiring committee prior to issuance of a solicitation for applications. In addition, the hiring process may include the option of public presentations by the final candidates, on a topic selected by the hiring committee, with an opportunity for feedback from the participants.
- LCBP staff are managed day-to-day by the LCBP and CVNHP Program Director, or other designated supervisors. All staff positions subordinate to the Program Director are hired via a typical competitive process coordinated by NEIWPCC, according to their standard hiring procedures, in close consultation with the LCBP/CVNHP Program Director and other LCBP staff as appropriate. The Chair of the Technical, Education and Outreach, or Heritage Area advisory committees may participate in the hiring process for the Coordinators of the respective committees.[3]

  - Job descriptions and specifications, salary scale, and all benefits follow NEIWPCC policies and procedures.
  - Provide all new employees with an orientation meeting in Lowell, Massachusetts. This orientation will serve to familiarize new employees with the NEIWPCC employee handbook, benefits, etc.
  - Address staff issues, as appropriate.
- Contractual and legal support
  - Act as contracting arm on behalf of LCBP efforts to accomplish OFA tasks.
  - Set up and manage agreements regarding office space arrangements and technical support.

[3] Lake Champlain Coordinator positions for the three Jurisdictions (New York, Québec, and Vermont) are hired via typical processes within the respective jurisdictions, in consultation with the Chair of the Citizen's Advisory Committee for that jurisdiction and the LCBP/CVNHP Program Director.

- Review and approve Requests for Proposals (RFPs) for third party contracts and participate in technical review of proposals, in accordance with NEIWPCC and LCBP templates and procedures. Post RFPs on NEIWPCC and LCBP websites.
- Execute and manage contracts/MOAs/subawards utilizing NEIWPCC standard templates; ensure compliance with contract terms and conditions.
- Provide liability coverage, as appropriate, for NEIWPCC and NEIWPCC staff, NEIWPCC officers, and NEIWPCC commissioners for involvement in performing work conducted under appropriate grants, cooperative agreements, and contracts.
- Provide recommendations to the Lake Champlain Steering Committee on improving contract scope, deliverables, and outcomes, or otherwise enhancing value and application of contracts and services, where appropriate.

- Financial
  - Prepare, maintain, and manage grant budgets; track expenditures by task, output and/or programmatic activity, planning, and work plan facilitation.
  - Process staffs travel reimbursements and timesheets.
  - Provide comprehensive bookkeeping and accounting services, including receipt and disbursement of funds, bill and invoice processing, and tax forms to personnel and independent contractors.
  - Ensure all relevant financial statements and tax documentation are prepared and filed.
  - Ensure all audited annual financial statements and unaudited quarterly financial statements are prepared and filed.
  - Provide all appropriate income tax reporting information/forms to personnel and independent contractors.
  - Submit the required financial reports to USEPA, including SF-334 "MBE/WBE utilization Under Federal Grants, etc." as necessary, and program progress reports and final award report and SF-425 Federal Financial Report (FFR), including interim and final FFRs as necessary. Submit required financial reports to other funding agencies where applicable.
  - Enter data into the government's Federal Funding Accountability and Transparency Act Subaward Reporting System, as required for EPA subawards.
- Quality Assurance
  - Provide a quality assurance program manager to review and approve Quality Assurance Project Plans. Provide guidance on which projects require QAPPs and how to develop QAPPs. NEIWPCC supports the goal of quality assurance and is committed to using only data of known and acceptable quality.

NEIWPCC uses a quality management system, documented in an EPA-approved Quality Management Plan (QMP).

- Other
    - Facilitate coordination with other NEIWPCC activities as appropriate.
    - Provide an annual NEIWPCC All Staff meeting to educate the staff on NEIWPCC programs, projects, and policies overall, to coordinate with staff in headquarters and other satellite offices, and to enhance organizational culture.
    - Provide assistance to LCBP to attract and direct federal and other resources to local needs, build needed scientific and watershed information, inform the public and policy makers, convene collaborative workgroups around key issues in the region, provide technical assistance for implementation actions of local grassroots-level organizations, promote an ecosystem perspective, and bring together funding, partners and projects to implement the defined goals and objectives of OFA.

LCBP and CVNHP Director

The Program Director serves many functions, including day-to-day management of LCBP/CVNHP activities, day-to-day staff supervision, providing administrative and technical support to Committees, conducting public outreach and education activities, coordinating and integrating activities with existing water quality and natural resource protection and restoration efforts in the region, and identifying partners that will advance OFA implementation. The LCBP/CVNHP Director ensures that all Committee decisions, including awarding of grants, are made in compliance with the LCBP Conflict of Interest Guidelines approved by the Lake Champlain Steering Committee (Appendix 1). In addition, the Program Director solicits local support for the Program, identifies additional sources of funding, and facilitates partner actions to help ensure there is no duplication of effort among partners.

Specific tasks of the LCBP/CVNHP Director include:

- Supervision
    - Supervise LCBP staff in consultation with NEIWPCC Lowell staff.
    - Evaluate the job performance of the LCBP staff, in consultation with NEIWPCC Lowell staff.
- Programmatic
    - Participate in and serve as primary staff support to the Steering Committee. Schedule meetings, develop agendas in coordination with the Chair, prepare reports on recent activity, provide technical support, channel information, and present recommendations to the Steering Committee for their approval.

Ensure geographic balance of Steering Committee meeting locations in New York, Quebec, and Vermont.

- Participate in and serve as primary staff support to the Executive Committee. Schedule meetings, develop agendas in coordination with the Chair, prepare reports of recent activity, provide technical support, channel information, and present recommendations to the Executive Committee for their approval.
- Work collaboratively with NEIWPCC staff on development of specific work plans and budgets for submission to respective funding agencies, following approval of the annual budget and general workplan by the Lake Champlain Steering Committee.
- Prepare and submit quarterly progress reports that describe LCBP/CVNHP activities, outcomes, and outputs to NEIWPCC Lowell staff.
- Assist and support LCBP in implementation of OFA.
- Ensure annual budget workplans address priority issues in OFA.
- Track and report to NEIWPCC and the Lake Champlain Steering Committee on progress toward completion of work plan deliverables.
- Lead activities outlined in EPA, GLFC, NPS, and other work plan(s)
- Strengthen partnerships and working relationships with key stakeholder organizations, including those involved with scientific research, advocacy, and industry. This includes state and federal agencies, municipalities, academic institutions, non-profit organizations, and industries.

- Interface with EPA Regions 1 and 2, GLFC, NPS, and other funding sources
  - In consultation with NEIWPCC, communicate with Project Officers at EPA, GLFC, NPS and other funding sources on a regular basis.
  - Jointly with NEIWPCC, meet with EPA Project Officers annually to coordinate issues between NEIWPCC/LCBP, the states, and the EPA.
  - If requested, prepare for and complete EPA Program Evaluations and site visits in consultation with Steering Committee and Host Entity.
- Other
  - As an employee of NEIWPCC, and as a supervisor of other NEIWPCC staff, demonstrate a thorough understanding of NEIWPCC policies and procedures.
  - Demonstrate a thorough understanding of LCBP's programs, organization, and policies.
  - Identify the necessary skills and expertise for additional staff positions in consultation with NEIWPCC and the Lake Champlain Steering Committee.
  - Communicate all efforts to NEIWPCC and the Lake Champlain Steering Committee on a regular basis.

- Remain up to date on regional and national developments relevant to LCBP/CVNHP mission, programs and projects.
- Represent the LCBP/CVNHP in regional and national forums.
- Provide internal and external leadership for the program, ensuring focus and progress on strategic priorities, as well as effective communication and collaboration with and among partner agencies, organizations, academic institutions, etc.
- Leverage LCBP/CVNHP resources, ensure best use of limited resources, minimize duplication of effort, and optimize public and community-based support.

Funding Source Coordination

NEIWPCC and LCBP staff will work with the assigned coordinators from each agency or organization providing funds to support the LCBP and Lake Champlain work via NEIWPCC. Typically, NEIWPCC and LCBP staff will ensure that workplan tasks are met according to the timelines established within each funding agreement. EPA staff provide a more involved role in the management of the Lake Champlain Steering Committee, the LCBP, and advisory Committees.

The Environmental Protection Agency

The EPA Regions 1 and 2 Offices and their Lake Champlain Basin Program staff Coordinators (the Coordinators) support the LCBP and NEIWPCC in many ways. A manager from EPA Region 1 and from Region 2 serves as a voting member of the Steering and Executive committees and the Lake Champlain Coordinators serve as the alternates on those committees. The Coordinators are non-voting members of the Technical Advisory Committee and may serve on other committees as deemed appropriate by the LCBP Director and the EPA. The Coordinators serve as the Project Officer and administer the Program's CWA Section 120 cooperative agreements, which includes reviewing work plans, reports, and participating in the program in a meaningful way. The Coordinators also serve as the primary contact between EPA and the LCBP, including serving as the liaison between LCBP and EPA Headquarters in the event of information requests, the program evaluation, and any other LCBP-related matters.

The Role of the EPA

Specific roles and responsibilities of the EPA Lake Champlain Basin Program Coordinators are as follows:

- Serve as the primary liaison between NEIWPCC, LCBP, and EPA:

    - Represent EPA priorities and programs as an alternate member of the LCBP Steering Committee and Executive Committee, and as an ex-officio member of the Technical Advisory Committee;
    - Serve as a conduit between the LCBP and EPA programs; identify opportunities for mutual assistance while also meeting individual program strategic goals.
    - Communicate LCBP interests during EPA Regional program decision-making to ensure decision makers understand implications for attainment of OFA goals and objectives.
    - Inform LCBP of EPA and other relevant initiatives that may affect LCBP study areas or OFA implementation.
    - Act as liaison to EPA programs to assist in meeting LCBP OFA goals and objectives.
    - Keep Region 1 and 2 management and staff informed about LCBP activities.
- Advise LCBP about EPA statutory and regulatory requirements.
- Facilitate networking and tech transfer; e.g., help inform LCBP about steps other programs are taking to address specific program elements or management issues.
- Assist NEIWPCC and LCBP with agreement/grant application, program management, and financial management requirements:
    - Serve as Project Officer and technical contact for the annual Section 120 cooperative agreement (review work plans; monitor performance; interface with Regional grants administration; notify NEIWPCC and LCBP of grant reporting requirements).
    - Inform NEIWPCC and LCBP about other core water program funding opportunities (grants and otherwise) that would support programmatic and implementation activities.
- Maintain contact and local presence with LCBP to support Lake Champlain management goals.
- Review, approve, and submit to EPA Headquarters reporting and budget data by the required deadline.
- In general, anticipate and respond to LCBP needs in a timely manner.

Appendices

1. Lake Champlain Basin Program Conflict of Interest policy

2017 – 2021 LCBP Management Plan Progress: Clean Water

Category	# Projects	Funds Awarded	Sum of Achievements*
Agriculture - Phosphorus reductions	23	$1,147,468	200+ conservation practices implemented on 150+ farms, reducing runoff from 30,000+ acres; outreach to 900+ farmers; development of training materials, models, and databases to assist with tracking and implementing nutrient reductions
Climate Change	1	$20,000	7 workshops held for community leaders
Conservation	1	$375,652	50 acres of wetlands restored and/or conserved
Fish Passage/Native Species	8	$519,273	3 dams removed; 4 culverts replaced; 100+ road-stream crossings assessed; 30+ miles of streams reconnected
Flooding	4	$124,344	Community outreach, development of flood response training materials, resiliency work
Habitat Assessment/ Forestry	3	$52,509	Removal of 8,000+ plastic tree tubes, removal of invasive species, erosion control assessments completed
Monitoring	16	$1,668,066	Annual support of the Long Term Monitoring Program, cyanobacteria monitoring, testing for cyanotoxins in drinking water, stream flow monitoring, lake meteorological data, load data analyzed
Research	12	$1,023,513	Stormwater best management practices evaluated, land use/ land Cover and impervious surface area mapped, innovative phosphorus reduction and treatment approaches evaluated, tile drain research
Riparian/Shoreline Restoration	21	$665,796	130+ acres planted or stewarded, removal of 12,000+ lbs of invasive plants, education and outreach to municipalities and communities,
Stormwater	40	$1,564,514	4 stormwater/green stormwater infrastructure master plans produced, 50+ stormwater best management practices installed, 25+ conceptual designs completed, 7 100% designs completed, 60+ stormwater assessments completed, 75,000+ pounds/year of sediment removed, educational materials produced, outreach
Toxins	4	$103,132	Fish mercury and cyanotoxin concentrations evaluated, antibiotic resistance evaluated, 1 plow truck retrofittted
Wastewater	5	$506,226	Sanitary sewer mapping for 2 municipalities, development of asset management plans for 13 wastewater treatment plants, purchase of equipment to improve phosphorus removal, conceptual designs produced for wastewater treatment plant and sewer system upgrades
TOTAL PROJECTS	**138**	**$7,770,493**	***Many CW projects cross OFA categories, but the classification here identifies the most-significant focus of each project. Achievements are summarized from projects accomplished between 2017-2021.**

LCBP Staff Accomplishments: Clean Water		
Scientific reporting		Staff conducted analyses and created a technical report on Lake Champlain tributary loading of phosphorus, nitrogen, chloride, and other water quality parameters. Staff authored a peer-reviewed article in the Journal of Contemporary Water Resources and Education that summarizes the development and accomplishments of the Lake Champlain Cyanobacteria Monitoring Program. Staff also authored multiple peer-reviewed manuscripts focused on nutrient management in the Lake Champlain Basin, published in Water Resources Research, Biogeochemistry, and Limnology and Oceanography: Methods.
Communicating science to stakeholdersv		Staff completed the development of new content and data for the State of the Lake and Ecosystem Indicators Reports in 2018 and 2021. Staff also launched and developed an LCBP Science Blog to communicate the latest science in the Lake Champlain Basin to managers and practitioners.
Binational water quality management		LCBP staff coordinated a binational study with Québec, Vermont, and USEPA colleagues to produce a report summarizing water quality-related efforts in Missisquoi Bay, and to generate a series of recommendations for collaborative work in this basin.
Monitoring		Staff worked with state partners to collect critical data for scientific analyses and watershed management as part of the Long-term Water Quality and Biological Monitoring Program. Staff worked to develop upgrades to the Long-term Monitoring Program that will collect high-frequency measurements of key water quality parameters and disseminate results to stakeholders immediately.
Coordination and collaboration		Staff coordinated the work of the LCBP Technical Advisory Committee, which interprets scientific information and provides guidance on research and funding priorities for Lake Champlain management. Staff served in leadership positions with numerous professional organizations and committees, including North American Lake Management Society, agricultural tile drain advisory committee, and regional brownfields advisory committee. LCBP staff coordinated the planning and hosting of the Lake Champlain Research Conference, which brought together more than 200 stakeholders for interdisciplinary sessions on lake science and management.
Agricultural water quality		Staff coordinated and managed several projects aimed at improving agricultural water quality, including tile drain monitoring studies, tile drain effluent filter studies, and studies that quantify the benefits of agircultural best management practices. Staff also served on several committees aimed at progressing and promoting agricultural water quality, including the Vermont Agricultural Water Quality Partnership, the VAAFM Tile Drain Advisory Group, and the VAAFM Payment for Ecosystem Services Workgroup.
Data and science quality		Staff coordinated the review and approval of more than 80 new quality assurance project plans (QAPPs) for projects requiring data collection or analysis to ensure consistent, high-quality environmental data.
Water quality management in Missisquoi and St. Albans Bays		Staff coordinated the work on several projects to reduce loading and manage water quality in Lake Champlain's shallow bays, including a U.S. Army Corps of Engineers project to evaluate alternatives for reducing phosphorus loading in St. Albans Bay, the development of an engineered ecosystem to reduce phosphorus loads into St Albans Bay, a study to determine ways to reduce internal loading to Missisquoi Bay, and a study to quantify the mass balance of phosphorus inputs and outputs for the entire Missisquoi Bay watershed.

2017 – 2021 LCBP Management Plan Progress: Healthy Ecosystems

Category	# Projects	Funds Awarded	Sum of Achievements*
AIS Outreach	6	$73,614	373+ river user surveys completed, 321+ people engaged at events, 11,000+ visitors educated, 4 outdoor AIS literature boxes installed, 51+ students educated, 5+ trainings held, 1 training video created, 90 tool-kits created
AIS Outreach & Spread Prevention	40	$596,832	92,160+ visitors greeted, 65,675+ watercrafts inspected, 2,134+ organisms removed, 633+ watercraft decontaminations performed, 6+ trainings, 88+ volunteers educated, 47+ lakes and ponds surveyed, 1 aquatic invasive species plant survey, 1 aquatic plant disposal station installed at boat ramp, 12,200 purple loosetrife beetles released into wetlands, 6+ presentations, 4+ educational outings, 15+ waterbodies surveyed, 1,039+ river user surveys completed, 8+ wader wash stations maintained, 300+ people engaged at events, 2,964+ dispersed cormorants, 43+ field visits monitored, 12+ property owners received technical assistance, 500+ brochures distributed, 10+ wader wash stations maintained, 47+ buckets of Eurasian Watermilfoil , 1 AIS Management Plan created for Lewis Creek
AIS Spread Prevention	15	$168,658	Mapped infestation of yellow iris and feasibility of removal for four Lake Champlain Tributaries, Mapped European frog-bit and Water chestnut populations in northern Lake Champlain, 6 sites samples for quagga mussels, 20,000+ gallons of Eurasian Watermilfoil removed, 1 hot water watercraft wash station installed, 73 yellow iris clumps treated, 1,272+ Water chestnut rosettes removed
TOTAL PROJECTS	**61**	**$839,104**	***Almost all HE projects cross OFA categories, but the classification here identifies the most-significant focus of each project. Achievements are summarized from projects accomplished between 2017-2021.**

LCBP Staff Accomplishments: Healthy Ecosystems		
LCBP Boat Launch Stewards		LCBP boat launch stewards inspected nearly 140,000 watercraft from 49 US states and Canadian provinces at public access points on Lake Champlain. Through these inspections, 3,183 aquatic invasive species were removed from watercraft and trailers. Staff also operated two high pressure, hot water decontamination stations at two high traffic launches on the lake.
WRDA Section 542		Phase 1 study for AIS barrier on Champlain Canal initiated. LCBP provided $200,000 in local sponsor match for the project.
Binational flood mitigation		LCBP staff served in multiple capacities including US Project Manager, Secretariat, and Public Advisory Group membership on the International Joint Commission Lake Champlain-Richelieu River flood mitigation study. LCBP also supported the US outreach work.
National, Regional, and Local engagement		Staff participated and served in leadership roles on multiple fish and wildlife and invasive species management committees, including the national Aquatic Nuisance Species Task Force, North American Lakes Management Society, Northeast Aquatic Nuisance, Species Panel, New York State Invasive Species Council Advisory Committee, Lake Champlain Fish and Wildlife Management Cooperative, and Fish Technical Advisory Committee.
Dam removal		Staff participated in Vermont Dam Task Force meetings and created and coordinated New York Dam Task Force meetings to identify and prioritize removal of dams and to improve aquatic organism passage and ecosystem health.
Hydrilla		Staff coordinated a multi-state effort to survey for and conduct genetics analyses of hydrilla in the Connecticut River. Hydrilla was intercepted by a boat launch steward inspecting a boat being launched into the lake at South Hero, VT.
Round Goby		Staff coordinated a coalition of resource managers to identify approaches and collaborative opportunities and to share information about round goby in the Champlain and Chambly canal systems.
Water Chestnut		Staff helped facilitate the renewal of funding agreements to support water chestnut control work in Lake Champlain. Staff participated in and coordinated hand harvesting days in south lake, Saint Albans bay, and Missisquoi Bay.

2017 – 2021 LCBP Management Plan Progress: Thriving Communities

Category	# Projects	Funds Awarded	Sum of Achievements*
Local Heritage	19	$94,680	Students learned about local history and culture and interpreted those lessons through artistic means
Collections	16	$100,897	Museum collections were protected, conserved, inventoried, cataloged, interpreted and displayed
Internship	6	$30,000	Interns learned how to work in the museum field
Interpretive Theme	24	$122,777	Partners showcased and highlighted the three interpretive themes of the CVNHP: Making of Nations, Corridor of Commerce, and Conservation & Community
Special Program	7	$180,942	Special Program Grants focus on each year's chosen interpretive theme, or area of concern, but are bigger in scale
TOTAL CVNHP PROJECTS	**72**	**$529,296**	***Almost all CVNHP projects cross OFA categories, but the classification here idetifies the most-significant focus of each project. Achievements are summarized from projects accomplished between 2017-2021.**
Organizational Support Grants	55	$185,990	Organizational Support grants provide support for increased organizational capacity and long-term effectiveness of watershed organizations working to implement elements of Opportunities for Action.
2020 COVID Emergency Organizational Support grants	14	$57,115	Grants were made available to support Lake Champlain-focused organizations facing significant financial challenges resulting from Stay Home orders and/or changes to or cancellation of spring work plan(s) as a result of the current COVID-19 pandemic.
TOTAL LCBP PROJECTS	**69**	**$243,105**	***Almost all CVNHP projects cross OFA categories, but the classification here idetifies the most-significant focus of each project. Achievements are summarized from projects accomplished between 2017-2021.**

LCBP Staff Accomplishments: Thriving Communities		
Wayside Exhibits		66 New Exhibits were made and 9 were refurbished
Publications		Revolutionary War Guide; International Year of the Salmon Banners and report; Women's Suffrage Banners
Interpretation		Find your Park Initiative, Passport Stamp program, NPS Centenial at ECHO; Lois McClure at the World Cannals Conference, Wild & Scenic Rivers, Cross-border Coordination of the 350th Anniversary of the “Valley of the Forts” Mohican Heritage Trail, The Glass Tour, 250th Anniverary of the American Revolution, Spitfire
Partnership Building		Lake Champlain Visitor Center; Regional Stakeholder Groups, Annual International Summit 2017-2021, American Museum of Fly Fishing, Champlain Valley Int'l Wine Trail, Clinton County Historical Assn., LCBP Resource Room at ECHO, Lake Champlain Bikeways,Lake George Historical Assn. and Museum, Pember Museum, Champlain-Adirondack Biosphere Network,

2017 – 2021 LCBP Management Plan Progress: Informed and Involved Public

Category	# Projects	Funds Awarded	Sum of Achievements*
Agricultural Best Management Practices Education	4	$28,313	1 demonstration plot, 5+ trainings, 2+ media announcements, 1 program developed, 4+ workshops, 6 information videos, 2 field days, 23+ educational events, 1 factsheet, 250+ individuals engaged
Aquatic Invasive Species Education	2	$13,827	3D models of ecologically similar native and invasive fish species, live animal tank with identification labels, webpage with a live feed of the tank, 2 interpretive panels, 1 factsheet created, 3,000 rosettes of water chestnuts removed
Basin History Education	11	$96,300	3,615+ individuals engaged, 2 school programs created, 1 county map floor puzzle created, 1 military heritage publication created, 26 events, 3 interpretive panels, 1 display tank, 444+ student participants, 75+ new volunteers
Community Action/ Awareness	8	$121,190	8 fishing trips, 1 community paddle event, 2 workshops, 5+ programs developed, 5+ volunteers trained, 13+ volunteer workdays, 191+ individuals engaged, 6+ internships supported, 20 videos developed, 20+ events, 1 brochure developed, 1 interpretive panel created
Contaminants of Emerging Concern Education	2	$19,944	2+ workshops, event tabling, fact sheets
Education via media/ communications	1	$10,000	12 short videos, 1 teacher curriculum
Forestry Best Management Practice Education	1	$7,000	1 training, 2 workshops
Habitat Restoration Education	6	$54,047	10+ acres of habitat replanted, 70+ student volunteers trained, 40 stream crossing/watershed signs installed, 4 interns supported, 12+ projects installed, 3+ workshops
Publication Development and Dissemination	3	$96,961	3 exhibits, 150,000 visitors engaged, 1 website redesign
School Outreach Programs	6	$47,500	223+ student participants, 3+ curricula created, 9+ schools participating, 10+ school and camp programs developed, 2+ student art exhibits, 11 student plays
Septic System Best Management Practices Education	2	$16,600	1 conference, 1 training, 2 factsheets, 8+ events, 108+ individuals engaged
Summer Youth Programs	5	$54,617	175+ youth participants, 5+ programs developed
Teacher/Curriculum Development	3	$18,044	8+ trainings developed

Category	# Projects	Funds Awarded	Sum of Achievements*
Water Quality Education	40	$374,848	6+ lesson plans created for teachers, 159+ school programs, 247+ public programs, 84+ media announcements, 1 lecture series, 158+ events, 7+ trainings, 9,651+ individuals engaged, 4+ brochures developed, 54,000+ brochures delivered, 1 youth summer camp program created, 1 stream table lending program developed, 11+ videos developed, 6 informational kiosks installed, 1 survey distributed, 8+ presentations created, 12+ projects implemented, 7+ programs developed, 1 watershed management plan created, 8+ workshops held, 145+ realtors trained
Wetland Education	1	$7,888	1 training, 14 professionals trained
TOTAL PROJECTS	**95**	**$967,079**	***Almost all IIP projects cross OFA categories, but the classification here identifies the most-significant focus of each project. Achievements are summarized from projects accomplished between 2017-2021.**

LCBP Staff Accomplishments: Informed and Involved Public		
Resource Room at ECHO Leahy Center for Lake Champlain		LCBP staff, interns, and volunteers provided accurate, informative lake-based messaging and educational material to nearly 115,000 youth and adult visitors at the LCBP Resource Room at the ECHO Leahy Center. Please note: Visitation to the ECHO Leahy Center was reduced between 2020-2021 due to the COVID pandemic.
Online/Social Media Outreach		Redesigned LCBP website in 2020, and regularly update information to achieve more than 160,000 visits annually. Organized and published LCBP's E-Newsletter and CVNHP E-Newsletter quarterly. Generated multi-weekly posts to Facebook to disperse current, local information quickly to the public (averaging more than 4,000 unique user views per month). Updated and published the digital Lake Champlain Basin Atlas in 2018.
Publication Development and Dissemination		Designed and published LCBP's Lake Champlain State of the Lake Report in 2018 and 2021. Designed, published LCBP's Annual Report from 2017-2021. Designed many end-user products including interpetive and informational signage, posters, rack cards, and maps that deliver information to the public.
Outreach by E&O Staff		Delivered more than 100 watershed and wetland-based, hands-on programs at elementary and middle schools throughout the Basin from 2017-2021. Organized and delivered more than 100 lake-based community presentations throughout the Basin, including the Love the Lake Series and State of the Lake presentations. Delivered over 125 watershed and wetland-based, hands-on programs at field trip locations throughout the Basin. Delivered interactive watershed-based demonstration to 200-300 youth and adults each year at the Ed Weed Fish Culture Station's Free Fishing Festival. Please note: Many outreach events between 2020-2021 were canceled or reduced in scope due to the COVID pandemic. With our Champlain Basin Education Initiative partners, designed and implemented two 5 credit gradute courses with 22 educators and five teacher workshops on natural and cultural resources for 48 educators.

LAKE CHAMPLAIN BASIN PROGRAM
and
CHAMPLAIN VALLEY NATIONAL HERITAGE PARTNERSHIP

Policy and Guidelines on Conflicts of Interest

Revised June, 2017

The Guidelines below apply to all operations of the Lake Champlain Basin Program (LCBP) and Champlain Valley National Heritage Partnership (CVNHP), including the external review of funding proposals, and to members of the Committees of the LCBP and CVNHP who are involved in reviews or funding decisions. These Guidelines are to be used when developing requests for proposals (RFPs), evaluating proposals, recommending funding awards, and developing budget priorities. Committee members who receive confidential information must take personal responsibility to avoid actual or potential conflicts of interest.

Introduction

The purpose of these Guidelines is to ensure that activities, particularly those related to the distribution of funds, are conducted in a fair manner and that there is neither a motivation, nor an appearance of a motivation, for private or personal gain.

This document addresses both actual and potential conflicts of interest. An actual conflict of interest could arise when an individual has a direct personal, familial, or financial relationship or connection with any of the activities, applicants, or proposals under review. If this relationship could directly influence a member's personal or professional benefit or interest, the relationship should not factor into the decision at hand and the individual should not be part of the decision making process.

A member has a potential conflict of interest if s/he has a relationship with the activities, applicants or proposals being reviewed that could potentially cause the member's professional judgement or actions to be impaired, or could influence their objectivity or impartiality. For example, a Committee member who is employed by an entity within an organization (e.g., Department X within Agency Z) and involved in a decision regarding a different entity within the same organization (e.g. Department Y within Agency Z) could be biased in favor of the sister entity.

For the purposes of LCBP and CVNHP committee members, a conflict of interest occurs when an LCBP or CVNHP Committee or subcommittee member

- stands to receive a direct financial benefit from a matter under discussion,
- has a personal or familial interest that may be substantially affected by a matter under discussion by the committee,
- has any other personal or professional interest or obligation that may affect the member's judgment regarding a matter under discussion, or
- may benefit personally or privately from the outcome of a decision or discussion.

Guidelines

1. **All** LCBP and CVNHP Committee members (members) are responsible for adhering to this Policy and Guidelines on Conflicts of Interest, and are encouraged to consult with the LCBP and CVNHP Director and the general procurement standards and competition requirements outlined in the Uniform Grant Guidance at *2 CFR 200.318 – General*

Procurement Standards and *2 CFR 200.319 Competition*. If the ability of a committee member to be impartial in a decision is impaired, this individual has a conflict of interest and must discuss this conflict with the LCBP and CVNHP Director.

2. **Members of LCBP and CVNHP Advisory Committees.** Individuals who contribute to the development of an RFP shall not respond to that same request in any capacity, including the provision of letters of support or recommendation to any entity that submits or is included in a proposal. Employees from organizational entities that employ staff who assist in the development or drafting of specifications, requirements, statements of work, or invitations for bids or requests for LCBP or CVNHP proposals must be excluded from competing for such procurements. See *2 CFR 200.319 Competition.*

   Individuals shall not participate in any review of an LCBP-funded task undertaken by their employer or from the same organizational entity, specifically a:
   - Department within an Agency (Vermont State Government),
   - Ministry (Quebec Government),
   - Division within a Department (New York State Government),
   - Department within a Municipal or County Government,
   - Academic department within a College or University,
   - Institution, such as a Conservation District or a formal Coalition, or
   - Organization, such as a Commission, Non-profit or For-profit Corporation,

   that has submitted a proposal which is under consideration. Recusal from participation requires absence from the discussion; presence is considered participation.

3. **Members of the Lake Champlain Steering Committee and Executive Committee.** Lake Champlain Steering Committee and Executive Committee members who represent government entities may be responsible for decisions that may affect their government organization; the knowledge they share is important to the successful outcome of program activities and as such these members will not be required to recuse themselves from the decision-making process. These members must disclose the nature of their relationship to the decision with other committee members and the LCBP and CVNHP Director as described in item #4 below. However, any Lake Champlain Steering Committee member who may stand to benefit or gain personally or privately from the outcome of a decision will have a legal conflict of interest and will be recused from participation in that decision. All Steering Committee members who are employed by for-profit private entities (e.g., engineering or consulting firm) will be recused from discussion of budget items that may affect their organization, regardless of whether they stand to benefit or gain personally from the outcome of the decision.

4. **Any member of LCBP Advisory Committees or subcommittees, or a non-governmental employee who is a member of the Lake Champlain Steering Committee, will be recused from the relevant discussion and decision if they have a conflict of interest. In addition, members must disclose a potential conflict of interest as soon as circumstances arise for it to become apparent.** The individual should contact the LCBP and CVNHP Director to discuss the issue; the Director may then choose to discuss the matter with the Chairs of the Steering Committee and Executive Committee. All Committee members who are employed within an organization, but not necessarily within the same entity of that organization where employment might constitute a potential or actual conflict of interest, must disclose this conflict of interest

in writing to the LCBP and CVNHP Director, and convey this conflict to the committee with which they are working. LCBP and CVNHP staff will be responsible for maintaining all conflict of interest disclosures for each decision process and ensuring that the Steering or Executive Committee (whichever is tasked with the decision in the related process) is made aware of any disclosures associated with that process. The individual may be asked to recuse him or herself from the process if necessary, including for potential conflicts of interest. The Lake Champlain Steering Committee may also determine, by simple majority vote by members present, that a conflict of interest has occurred, and take appropriate steps to ensure that the issue is resolved appropriately.

5. Any Committee member whose organizational entity has submitted a workplan, report or other contractual deliverable to that Committee for review may participate in the discussion of the report, but shall abstain from voting on decisions related to the report.

6. All LCBP Committee members and external peer reviewers must treat all materials related to an RFP, proposal for LCBP funding, technical work plan review, or grant review process as strictly confidential to the extent allowed by law. Violation of that confidentiality constitutes a conflict of interest if it potentially gives an unfair advantage to any party ***or*** releases information pertaining to or the identities of applicants or confidential peer reviewers.

7. Statute of Limitations on Conflicts of Interest from previous places of employment. Members of the Lake Champlain Steering Committee or LCBP advisory committees and subcommittees will have a conflict of interest if they participate in a decision that affects their former employer within one year of the member's termination from that place of employment. If termination of employment occurred more than one-year prior, the committee member may choose to recuse him/herself if s/he feels his/her prior employment would cause them to be biased.

8. Conflict of Interest disclosure form. This guidance document should be reviewed by each LCBP Committee and subcommittee member annually. The disclosure form (below) should be signed by each individual who chooses to participate in a decision process for which they may have a potential conflict of interest.

Potential Conflict of Interest Disclosure (to be submitted on each occasion for which the member has a conflict of interest):

I, _____ have a potential conflict of interest in the following decision process: [describe decision]. The potential conflict of interest is: [describe the situation]. I feel that I should participate in the discussion of this matter because [describe the added benefit that the member will provide] and will not be influenced or biased by this potential conflict of interest. I have discussed this issue with the LCBP and CVNHP Director and the Chair of my LCBP Committee.

Signed: Date:

Steering Committee

Richard Balla*
U.S. Environmental Protection Agency Region 2

William (Breck) Bowden, Ph.D.
Lake Champlain Sea Grant

Melville Coté*
U.S. Environmental Protection Agency Region 1

Maya Dehner
U.S. Army Corps of Engineers, NY District

Joe Flynn
Vermont Agency of Transportation

Blake Glover
U.S. Department of Agriculture-Natural Resources Conservation Service

Buzz Hoerr*
Chair, Education and Outreach Committee

Neil Kamman*
Chair, Technical Advisory Committee

John Krueger, Ph.D.*
Chair, Heritage Area Program Advisory Committee

Laura Trieschmann
Vermont Agency of Commerce and Community Development

Brian Steinmuller
New York State Department of Agriculture & Markets

Louise Leblanc
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec

Pierre Leduc*
Chair, Comité consultatif des citoyens du Québec (Québec CAC)

Daniel MacKay
New York State Office of Parks, Recreation & Historic Preservation

Christina Marts
U.S. National Park Service

Andrew Milliken
U.S. Fish & Wildlife Service

Julie Moore*
Vermont Agency of Natural Resources

Mark Naud*
Chair, Vermont Citizens Advisory Committee

Jean-François Ouellet
Ministère des Forêts, de la Faune et des Parcs

Nathalie Provost*
Ministère de l'Environnement et de la Lutte aux changements climatiques

Vic Putman*
Chair, New York Citizens Advisory Committee

Gilles Rioux
Mayor, Municipalité Stanbridge Station

Anson Tebbetts
Vermont Agency of Agriculture, Food & Markets

Travis Thomason
U.S. Department of Agriculture-Natural Resources Conservation Service

Stephen Hunt
New York Empire State Development

Miro Weinberger
Mayor, City of Burlington

Joseph Zalewski*
New York State Department of Environmental Conservation

* Executive Committee members

New York Citizens Advisory Committee (NY CAC)

Jackie Bowen
Adirondack Council

James C. Dawson, Ph.D.
SUNY Plattsburgh Emeritus

Jane Gregware
NY Farm Bureau

Steve Kramer
Miner Institute

Rick Lauren
Public Representative

Walt Lender
Lake George Association

Tom Metz
Public Representative

Hannah Neilly
Essex County Office of Community Resources

Vic Putman (Chair)
Town of Essex

Charlotte Staats
Adirondack Mountain Club

Bill Wellman
Public Representative

Fred Woodward
Public Representative

Québec Citizens Advisory Committee (QC CAC)

Jean Asnong
Syndicat de l'UPA MRC Brome Missisquoi

Andrej Barwicz
Association pour la protection du lac Parker

Monique Bergeron
Pourvoirie Courchesne

Nathalie Fortin
Citoyenne

Louise Hébert
OMYA

Jacques Landry
MRC Haut Richelieu

David Largy-Nadeau
MRC Memphrémagog

Pierre Leduc (Chair)
Citoyen

Francis Mailloux
Conservation Baie Missisquoi

Ana Maria Martin
Syndicat de l'UPA du Haut-Richelieu

Gilles Rioux
MRC Brome Missisquoi

Caroline Rosetti
MRC Brome Missisquoi

Urbain Swennen
Syndicat de l'UPA MRC Brome Missisquoi

Vermont Citizens Advisory Committee (VT CAC)

Senator Randy Brock

Eric Clifford
Dairy Farmer

Karina Dailey
Environmental Scientist

Rep. Kari Dolan

Wayne Elliot
Engineer

Lori Fisher
Lake Champlain Committee

Robert Fischer
Water Facility Operator

Senator Chris Bray

Mark Naud (Chair)
Attorney/Business Owner

Rep. Carol Ode

Denise Smith (Vice Chair)
Community Health Manager

Hilary Solomon
Conservation District Manager

Jeff Wennberg
Retired Public Works Commissioner

Heritage Area Partnership Advisory Committee (HAPAC)

Simon Bergeron
Business Owner

Lou Bresee
Lake Champlain Bikeways

Suzie O'Bomsawin
Conseil des Abénakis d'Odanak

Kelly Cerialo, Ph.D.
Paul Smith's College

Isabelle Charlebois
Tourisme Haut Richelieu

James Connolly
Retired, NYSDEC

John Krueger, Ph.D. (Chair)
Retired, City of Plattsburgh Historian

Jane Lendway
Retired, Vermont State Historic Preservation Officer

Jim Lockridge
Big Heavy World

Suzanne Maye
Essex County Visitors Bureau

Celine Paquette
Samuel de Champlain History Center

Steve Peters
Business Owner

Technical Advisory Committee (TAC)

William Ardren, Ph.D. (Vice Chair)
U.S. Fish and Wildlife Service

Jennifer Callahan
VT Agency of Transportation

Ryan Cunningham
NY Department of Agriculture

Dennis DeWeese
NY USDA-NRCS

Ryan Davies
Clinton County Health Department

Laura DiPietro and Ryan Patch
VT Agency of Agriculture

Bryan Dore
USEPA Region 1 (ex-officio non-voting)

Curt Gervich, Ph.D.
SUNY Plattsburgh

Peter Isles, Ph.D.
VT Department of Environmental Conservation

Neil Kamman (Chair)
VT Department of Environmental Conservation

Steve Kramer
Miner Institute

Margaret Murphy, Ph.D.
VT Fish & Wildlife Department

Bridget O'Brien
VT Department of Health

Michele Fafette
USEPA Region 2 (ex-officio non-voting)

Oliver Pierson
VT Department of Environmental Conservation

Andrew Schroth, Ph.D.
University of Vermont

James Shanley, Ph.D.
US Geological Survey

Lauren Townley
Department of Environmental Conservation

Daniel Tremblay
QC Ministère de l'Environnement et de la Lutte contre les changements climatiques

Ryan Waldron
NY Department of Environmental Conservation

Leigh Walrath
Adirondack Park Agency

Education & Outreach Advisory Committee (E&O)

Anthoni Barbe
Organisme Bassin Versant Baie Missisquoi

Karen Bates
VT Department of Environmental Conservation, Water Investment Division

Julie Berlinski
NYS Department of Environmental Conservation, Water Quality Division

Buzz Hoerr (Chair)
IGES Corporation. COO

Bruce Lawson
Broadcast & Digital Media

John Little
Educator and watershed group representative

Betsy Lowe
Government relations and community engagement

Amy Overstreet
USDA – NRCS VT

Kristine Stepenuk, Ph.D.
Lake Champlain Sea Grant

Fenwick "Hap" Wheeler
Information technology management

Staff Supporting the Lake Champlain Basin Program

(NEIWPCC staff, unless otherwise noted)

Bryan Dore
Project Officer, USEPA Region 1

Mario Paula and Michele Fafette
Project Officer, USEPA Region 2

Jim Brangan
Cultural Heritage & Recreation Coordinator

Philip Brett
Boat Launch Steward & Data Manager

Mae Kate Campbell
Technical Associate

Sarah Coleman, Ph.D.
VT Lake Champlain Coordinator, Vermont Department of Environmental Conservation

Katie Darr
CAC and CABN Coordinator

Susan Hagar
Education and Outreach Steward

Colleen Hickey
Education & Outreach Coordinator

Laura Hollowell
LCBP Resource Room Specialist

Eric Howe, Ph.D.
LCBP & CVNHP Director

Kathy Jarvis
Office Manager

Lauren Jenness
Environmental Analyst

Stephanie Larkin
LCBP Resource Room Specialist

Myra Lawyer
Agronomist
New York Department of Environmental Conservation/LCBP-NEIWPCC

Elizabeth Lee
Communications Associate

Ryan Mitchell
Communications Coordinator

Meg Modley Gilbertson
Aquatic Invasive Species Management Coordinator

Cynthia Norman
LCBP Resource Room Specialist

Pete Stangel
Long Term Monitoring Biologist
Vermont Department of Environmental Conservation/LCBP-NEIWPCC

Daniel Tremblay
Quebec Lake Champlain Coordinator, Ministère de l'Environnement et de la Lutte aux changements climatiques

Matthew Vaughan, Ph.D.
Chief Scientist

Erin Vennie-Vollrath
NY Lake Champlain Coordinator
New York Department of Environmental Conservation/LCBP-NEIWPCC

MEMORANDUM OF UNDERSTANDING

ON
ENVIRONMENTAL COOPERATION
ON
THE MANAGEMENT OF LAKE CHAMPLAIN

AMONG

THE STATE OF NEW YORK,

THE GOUVERNEMENT DU QUÉBEC

AND

THE STATE OF VERMONT

THE STATE OF NEW YORK,

THE GOUVERNEMENT DU QUÉBEC

AND

THE STATE OF VERMONT,

WHEREAS the Lake Champlain Basin is a public treasure shared by the State of New York, Québec and the State of Vermont;

WHEREAS the State of New York, Québec and the State of Vermont share a common boundary on Lake Champlain and have a shared goal to protect, conserve and manage the Waters of the Basin since 1988;

WHEREAS while there has been significant progress in restoring and improving the health of the Lake Champlain Basin Ecosystem, the Waters, Water Dependent Natural Resources and the Cultural Heritage and Recreation Resources of the Basin remain at risk and continue to be sensitive to damage;

WHEREAS the State of New York, Québec and the State of Vermont must balance economic development, social development and environmental protection as interdependent and mutually reinforcing pillars of sustainable development;

WHEREAS in light of possible variations in climate conditions and the potential cumulative effects of demands that may be placed on the Waters of the Basin, the State of New York, Québec and the State of Vermont must act to ensure the protection and conservation of the Waters and Water Dependent Natural Resources of the Basin for future generations;

WHEREAS the State of New York, Québec and the State of Vermont recognize the critical and complementary role that each jurisdiction has in implementing the Lake Champlain Basin's long-term management plan entitled *Opportunities for Action: an evolving plan for the future of the Lake Champlain Basin*;

RECOGNIZING that the Lake Champlain Steering Committee (hereinafter called Steering Committee), owing to the ongoing support of the Lake Champlain Basin Program, constitutes the best instrument for ensuring the efficient coordination of efforts deployed by each of the Parties for implementing the Lake Champlain Basin's long-term management plan;

WISHING to pursue their cooperation to ensure the protection and conservation of the Lake Champlain Basin, its restoration and enhancement and to maintain the integrity of its ecosystem;

THEREFORE THE PARTIES HEREBY AGREE TO THE FOLLOWING:

SECTION 1: PURPOSE OF THE MEMORANDUM OF UNDERSTANDING

The purpose of the Memorandum of Understanding is to:

1.1 maintain the Steering Committee for cooperative management of Lake Champlain and its watershed to enhance and preserve the character of the Lake and its environs;

1.2 build upon those cooperative relationships and historic program compacts which are currently operative;

1.3 enhance and establish, where necessary, a process for the regular exchange of information and for more systematic cooperation in research and data gathering, on subjects affecting the Lake including but not limited to:

- water quality;
- water conservation;
- air quality;
- water quantity;
- lake levels;
- recreational resources;
- cultural heritage resources;
- fish and wildlife;
- nuisance species management;
- blue-green algae and other cyanobacteria;
- economic vitality;
- natural resource management;
- solid waste management;
- pesticide and herbicide applications;
- toxic and hazardous materials management;
- aesthetics and critical environmental areas;

1.4 provide a mechanism for the participation of each jurisdiction in regulatory proceedings addressing significant actions affecting the Lake and its Basin; and

1.5 facilitate collaboration between governments and the various organizations that could contribute to flood prevention and forecasting or to mitigation of damages from future floods in the watersheds of Lake Champlain and the Richelieu River.

SECTION 2: STEERING COMMITTEE

2.1 Chairmanship and membership

The Steering Committee is co-chaired by the New York State Commissioner of the Department of Environmental Conservation, the Minister of Sustainable Development, Environment and the Fight against Climate Change of Québec and the Vermont Secretary of the Agency of Natural Resources. Each co-chair may designate a delegate to carry out responsibilities under the Memorandum of Understanding.

Membership on the Steering Committee may include officials from other state, federal, and provincial agencies or departments having an interest in the cooperative programs. Steering Committee membership may also include the Chairs of the Citizens Advisory Committee, a local government representative from each of the three jurisdictions, Technical Advisory Committee Chair, Cultural Heritage and Recreation Advisory Committee Chair, and Education and Outreach Advisory Committee Chair.

2.2 Functions of the Steering Committee

The role of the Steering Committee is to:

a. provide a forum for discussion of policies and issues of mutual concern;

b. identify topics of mutual interest where the exchange of information and cooperative actions will be beneficial;

c. implement the Lake Champlain Basin's long-term management plan *Opportunities for Action: an evolving plan for the future of the Lake Champlain Basin*;

d. prepare and approve the annual budget for the Lake Champlain Basin Program, and identify additional resources necessary for plan implementation;

e. review the progress of cooperative efforts for management of Lake Champlain and make recommendations for future activities;

f. seek the involvement of the public and appropriate academic institutions in the joint effort to guide management of the Lake;

g. promote interaction among regulatory and management programs in the review of developments that affect the Lake; and

h. revise and update *Opportunities for Action: an evolving plan for the future of the Lake Champlain Basin* on a five-year schedule.

2.3 Relationship to the Lake Champlain Basin Program

The Steering Committee maintains close relations with the Lake Champlain Basin Program (LCBP) whose mandate is to:

a. facilitate the cooperation and development of consensus on matters arising under this Memorandum of Understanding;

b. ensure the monitoring and report on the implementation of this Memorandum of Understanding and the long-term management plan *Opportunities for Action: an evolving plan for the future of the Lake Champlain Basin* and updates made by the Parties, including: data collection; and the implementation of programs by each of the Parties;

c. establish, in collaboration with the Parties, basin-wide goals and make recommendations about them;

d. make recommendations to the Parties on the development and enhancement of water management programs;

e. perform any other functions necessary to implement this Memorandum of Understanding.

2.4 Annual Report

The Parties shall cooperate with the Lake Champlain Basin Program to report on cooperative programs. This report is distributed to members of the respective Legislatures, and to the public.

2.5 Coordination

Each co-chair designates a staff person to coordinate involvement among agencies or departments of the Party it represents and to develop more detailed protocols for fulfilling the goals of cooperation and information sharing.

2.6 Meeting

The Steering Committee shall meet at least twice yearly or on a more frequent basis as needed. Special committee meetings may be convened at the request of any of the three Parties.

SECTION 3: DOCUMENTATION AND INFORMATION EXCHANGES

The Parties agree to exchange, on a regular basis, copies of legislative texts, bills, regulations, guidelines, brochures, studies, reports, bulletins and other materials concerning the ecosystem of Lake Champlain and its environment.

SECTION 4: PRIOR NOTIFICATION AND CONSULTATION

The Parties further agree, where practicable, to provide prior notification and opportunity for consultation to each other on any pending major action which could affect the environmental quality of the Lake. The Parties also agree to provide notice and consultation in the case of any event (natural or accidental) which could affect the environmental quality of the Lake.

SECTION 5: SCIENTIFIC RESEARCH

The Parties agree to examine the possibility of carrying out, where feasible, joint scientific research of environmental subjects of mutual interest.

SECTION 6: CONSULTATION WITH THE PUBLIC

The Parties agree to develop and implement an appropriate public participation program and to support the activities of the Citizens Advisory Committees.

SECTION 7: EFFECTIVE DATE OF MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is to be in force upon the last signing of the Parties, and remaining operative for a five (5) year period. However, this Memorandum of Understanding may be rescinded or terminated at an earlier date by any of the Parties providing six (6) months notice in writing to the other Party. Further, this Memorandum of Understanding may be amended or modified at any time upon the agreement of all Parties.

This Memorandum of Understanding repeals and replaces as of its entry into force the Memorandum of Understanding on Environmental Cooperation Agreement on the Management of Lake Champlain among the State of New York, the gouvernement du Québec and the State of Vermont signed in Québec City on March 11, 2010 and in Albany on March 16, 2010.

Done in triplicate in the English and French languages, both texts being equally authentic.

At Albany, the 27 April 2015 At Burlington, the 23 March 2015

THE STATE OF NEW YORK

Andrew M. Cuomo
Governor

THE GOUVERNEMENT DU QUÉBEC

Philippe Couillard
Premier

At Burlington, the 23 March 2015

THE STATE OF VERMONT

Peter Shumlin
Governor

Witnessed:

At Albany, the 27th April, 2015
THE STATE OF NEW YORK

Joseph J. Martens
Commissioner
Department of Environmental Conservation

At Burlington, the 23 March 2015
THE STATE OF VERMONT

Deborah Markowitz
Secretary
Agency of Natural Resources

Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain among the State of New York, The Gouvernment du Québec and the State of Vermont - French

ENTENTE DE COOPÉRATION

EN MATIÈRE
D'ENVIRONNEMENT
RELATIVEMENT
À LA GESTION DU LAC CHAMPLAIN

ENTRE

L'ÉTAT DE NEW YORK,

LE GOUVERNEMENT DU QUÉBEC

ET

L'ÉTAT DU VERMONT

L'ÉTAT DE NEW YORK,

LE GOUVERNEMENT DU QUÉBEC

ET

L'ÉTAT DU VERMONT

ATTENDU QUE le bassin du lac Champlain constitue une richesse publique partagée par l'État de New York, le Québec et l'État du Vermont;

ATTENDU QUE l'État de New York, le Québec et l'État du Vermont partagent une frontière commune sur le lac Champlain et qu'ils ont pour objectif commun de protéger, conserver et gérer les eaux du bassin depuis 1988;

ATTENDU QUE les eaux, les ressources naturelles qui en dépendent, le patrimoine culturel et les ressources récréatives du bassin demeurent à risque et vulnérables aux dommages, en dépit des progrès significatifs réalisés pour la restauration et l'amélioration de la santé de l'écosystème du bassin du lac Champlain;

ATTENDU QUE l'État de New York, le Québec et l'État du Vermont doivent équilibrer le développement économique, le développement social et la protection environnementale, les trois piliers du développement durable qui sont interdépendants et qui se renforcent mutuellement;

ATTENDU QUE l'État de New York, le Québec et l'État du Vermont doivent, en fonction des variations des conditions climatiques et des effets cumulatifs potentiels que la demande pour les eaux du bassin pourrait entraîner, agir pour garantir aux générations futures la protection et la conservation des eaux du bassin et des ressources naturelles qui en dépendent;

RECONNAISSANT le rôle essentiel et complémentaire de l'État de New York, du Québec et de l'État du Vermont dans la mise en œuvre du plan de gestion à long terme du bassin du lac Champlain intitulé *Perspectives d'action : un plan progressif pour l'avenir du bassin du lac Champlain*;

CONSTATANT que le Comité directeur du lac Champlain (ci-après « Comité directeur »), grâce au soutien continu du Programme de mise en valeur du bassin du lac Champlain, constitue le meilleur instrument pour assurer la coordination efficace des efforts déployés par chacune des Parties dans la mise en œuvre du plan de gestion à long terme du bassin du lac Champlain;

DÉSIREUX de poursuivre leur coopération en vue d'assurer la protection et la conservation du bassin du lac Champlain, sa restauration et son amélioration ainsi que de maintenir l'intégrité de son écosystème;

LES PARTIES CONVIENNENT DES DISPOSITIONS SUIVANTES :

ARTICLE PREMIER
OBJET DE L'ENTENTE

La présente entente vise à :

1.1 confirmer le rôle du Comité directeur dans la gestion coopérative de ce bassin, de façon à mettre en valeur et à préserver le caractère du lac et de ses environs;

1.2 renforcer les relations de coopération et les ententes de sauvegarde du patrimoine historique actuellement en vigueur;

1.3 améliorer et établir, lorsque jugé approprié, les mécanismes permettant d'assurer l'échange régulier d'information et de systématiser la collaboration en matière de recherche et de collecte de données sur tout sujet touchant le lac, y compris sans s'y restreindre :

- la qualité de l'eau;
- la conservation de l'eau;
- la qualité de l'air;
- la quantité d'eau;
- le niveau des eaux du lac;
- les loisirs;
- les ressources patrimoniales et culturelles;
- les ressources ichtyologiques et fauniques;
- la gestion des espèces nuisibles;
- les algues bleu-vert et autres cyanobactéries;
- la vitalité de l'économie;
- la gestion des ressources naturelles;
- la gestion des déchets solides;
- l'utilisation de pesticides;
- la gestion des substances toxiques et dangereuses;
- les préoccupations esthétiques et les zones écologiquement vulnérables;

1.4 élaborer un mécanisme qui permette à chaque Partie de participer aux procédures relatives à la réglementation des activités susceptibles de répercussions significatives sur le lac Champlain et son bassin; et

1.5 favoriser la collaboration entre les gouvernements et les différentes organisations pouvant contribuer à la prévention et à la prévision des inondations ainsi qu'à l'atténuation des dommages que provoqueraient d'éventuelles inondations dans le bassin hydrographique du lac Champlain et de la rivière Richelieu.

ARTICLE 2
COMITÉ DIRECTEUR

2.1 Présidence et Constitution

Le Comité directeur est coprésidé par le commissaire au *Department of Environmental Conservation* de l'État de New York, le ministre du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques du Québec et par le secrétaire de *l'Agency of Natural Resources* de l'État du Vermont. Chaque coprésident peut désigner un délégué pour assumer les responsabilités qui lui incombent en vertu de la présente entente.

Le Comité directeur peut compter parmi ses membres des représentants d'autres ministères, agences ou organismes d'États américains, provincial, ou fédéral et intéressés par ces programmes de coopération. Il peut aussi comprendre les présidents de comités consultatifs de citoyens, un représentant des autorités locales provenant de chacune des Parties, le président du comité consultatif technique, le président du comité consultatif du patrimoine culturel et des activités récréatives et le président du comité consultatif de l'éducation et de la sensibilisation.

2.2 Fonctions du Comité directeur

Le Comité directeur a pour fonctions de :

a. constituer un forum de discussions sur les politiques et les questions d'intérêt mutuel;

b. identifier les domaines d'intérêts mutuels susceptibles de bénéficier du partage d'information et de la coopération entre les Parties;

c. mettre en œuvre le plan de gestion à long terme du lac Champlain intitulé *Perspectives d'action : un plan progressif pour l'avenir du bassin du lac Champlain*;

d. préparer et approuver le budget annuel du Programme de mise en valeur du bassin du lac Champlain et d'évaluer les ressources additionnelles nécessaires à la réalisation du plan;

e. superviser la progression des efforts déployés conjointement pour la gestion du lac Champlain et recommander d'autres activités;

f. susciter la participation du public et des établissements d'enseignement aux efforts déployés conjointement pour guider la gestion du lac;

g. favoriser l'interaction entre les programmes de réglementation et de gestion en ce qui a trait à la supervision de tout ce qui concerne le lac Champlain; et

h. réviser et mettre à jour le plan de gestion du lac Champlain *Perspectives d'action : un plan progressif pour l'avenir du bassin du lac Champlain* suivant un échéancier de cinq ans.

2.3 Relations avec le Programme de mise en valeur du lac Champlain

Le Comité directeur maintient des relations étroites avec le Programme de mise en valeur du lac Champlain (*Lake Champlain Basin Programme [LCBP]*) dont le mandat est de :

a. faciliter la coopération et le développement de consensus sur les questions découlant de la présente entente;

b. assurer le suivi et faire rapport de la mise en œuvre de l'entente et du plan de gestion à long terme *Perspectives d'action : un plan progressif pour l'avenir du bassin du lac Champlain* ainsi que des mises à jour effectuées par chacune des Parties, incluant la collecte d'informations et la mise en œuvre de programmes par chacune des Parties;

c. fixer, en collaboration avec les Parties, des objectifs à l'échelle du bassin et faire des recommandations à ce sujet;

d. présenter des recommandations aux Parties portant sur le développement et l'amélioration des programmes de gestion de l'eau;

e. effectuer toute autre tâche nécessaire à la mise en œuvre de la présente entente.

2.4 Rapport annuel

Les Parties collaborent au Programme de mise en valeur du bassin du lac Champlain par la publication d'un rapport annuel sur les activités de coopération. Ce rapport est distribué aux membres de leur assemblée législative respective et au grand public.

2.5 Coordination

Chaque coprésident désigne une personne chargée de coordonner la participation des organismes ou ministères de la Partie qu'il représente et d'élaborer des protocoles détaillés permettant d'atteindre les objectifs de coopération et de partage de l'information.

2.6 Assemblées

Le Comité directeur se réunit deux fois l'an ou plus fréquemment, selon les besoins. Chacune des Parties peut convoquer une assemblée extraordinaire.

ARTICLE 3

ÉCHANGES DE DOCUMENTATION ET D'INFORMATION

Les Parties conviennent d'échanger régulièrement les textes de loi, les projets de loi, règlements, directives, brochures, études, rapports, bulletins et autres documents touchant l'écosystème du lac Champlain et son environnement.

ARTICLE 4

AVIS ET CONSULTATIONS PRÉALABLES

Les Parties conviennent, lorsque cela est réalisable, d'aviser et de consulter leurs homologues avant la réalisation de tout projet d'importance pouvant porter atteinte à la qualité de l'environnement du lac. Les Parties conviennent en outre de s'aviser et de se consulter mutuellement en cas d'événement naturel ou accidentel pouvant altérer la qualité de l'environnement du lac.

ARTICLE 5

RECHERCHE SCIENTIFIQUE

Les Parties s'entendent pour évaluer la possibilité, lorsque qu'approprié, de mener des recherches scientifiques conjointes sur des sujets d'ordre environnemental et d'intérêt mutuel.

ARTICLE 6

PARTICIPATION DU PUBLIC

Les Parties conviennent d'élaborer et de mettre en œuvre un programme approprié de participation du public et de soutenir les activités des comités de citoyens.

ARTICLE 7

DISPOSITIONS FINALES

La présente entente entre en vigueur à la date de sa dernière signature par les Parties et le reste pour une durée de cinq (5) années. Elle peut toutefois être abrogée ou dénoncée en tout temps par une Partie au moyen d'un avis écrit d'au moins six (6) mois transmis aux autres Parties. En outre, cette entente peut, du consentement des Parties, être modifiée en tout temps.

La présente entente abroge et remplace, à partir de son entrée en vigueur, l'Entente de coopération en matière d'environnement relativement à la gestion du lac Champlain entre l'État de New York, le gouvernement du Québec et l'État du Vermont, signée à Québec, le 11 mars 2010 et à Albany le 16 mars 2010.

Fait en triple exemplaire, en langue française et en langue anglaise, les deux textes faisant également foi.

À Albany, le 27 April 2015 À Burlington, le 23 mars 2015

POUR L'ÉTAT DE NEW YORK

Andrew M. Cuomo
Gouverneur

POUR LE GOUVERNEMENT DU QUÉBEC

Philippe Couillard
Premier ministre

À Burlington, le 23 mars 2015

POUR L'ÉTAT DU VERMONT

Peter Shumlin
Gouverneur

Témoins

À Albany, le 27 April, 2015 À Burlington, le 23 mars 2015

POUR L'ÉTAT DE NEW YORK

Joseph J. Martens
Commissaire
Department of Environmental Conservation

POUR L'ÉTAT DU VERMONT

Deborah Markowitz
Secrétaire
Agency of Natural Resources

COOPERATION AGREEMENT

BETWEEN

THE GOUVERNEMENT DU QUÉBEC

AND

THE STATE OF VERMONT

CONCERNING PHOSPHORUS REDUCTION
IN MISSISQUOI BAY

THE GOUVERNEMENT DU QUÉBEC,
represented by the Minister of the Environment and the Fight against Climate change, Mr. Benoit Charette

AND

THE STATE OF VERMONT,
represented by the Secretary of the Agency of Natural Resources, Ms. Julia S. Moore

Hereinafter, collectively designated the "Parties",

WHEREAS the Missisquoi Bay watershed, draining 310,527 hectares (767,312 acres) and encompassing surface waters that cross international boundaries, is shared between Québec and the State of Vermont (the "Parties");

WHEREAS in 2017, the Parties and the State of New York endorsed *Opportunities for Action: An Evolving Plan for the Future of Lake Champlain,* the basin wide long-term management plan supporting phosphorus reduction targets established by the Vermont and New York Total Maximum Daily Load (TMDLs) and reduction plans identified for the Québec portion of Missisquoi Bay;

WHEREAS while there has been significant implementation of pollution reduction projects in improving the water of the Missisquoi Bay watershed, the Bay remains at risk and continues to be sensitive to damage;

WHEREAS the Agreement between the gouvernement du Québec and the government of the State of Vermont concerning phosphorus reduction in Missisquoi Bay signed August 26, 2002 and expired on December 31, 2016 included a 0.025 mg/L in-lake phosphorus concentration criterion for Missisquoi Bay and a 97,2 mt/yr (metric tons per year) total target phosphorus load for the Missisquoi Bay watershed;

WISHING to pursue their cooperation to ensure the protection and conservation of Missisquoi Bay, its restoration, and to improvement of the integrity of its ecosystem;

RECOGNIZING that the Minister of Environment and Fight against Climate Change of Québec and the Vermont Secretary of the Agency of Natural Resources are delegated to carry out responsibilities under this Agreement;

THEREFORE, THE PARTIES HEREBY AGREE TO THE FOLLOWING:

ARTICLE 1
PURPOSE OF THE AGREEMENT

The purpose of this Agreement is to establish the framework for cooperation between the Parties to reduce their respective contributions to the annual load of phosphorus entering Missisquoi Bay and to report on progress towards attaining the mutually agreed target load.

ARTICLE 2
COMMITMENTS OF THE PARTIES

2.1 For the purpose of the implementation of this Agreement, the in-lake criterion for total phosphorus concentration in Missisquoi Bay of 0.025 mg/L (hereinafter the « target concentration ») established through previous commitments of the Parties, continues to be an appropriate goal for phosphorus management in the Missisquoi Bay watershed.

2.2 The Parties shall hereby seek achievement of the target total phosphorus concentration for Missisquoi Bay in a manner consistent with the objectives of the Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain among the Gouvernement du Québec, the State of Vermont and the State of New York expired on April 27, 2020.

2.3 The Parties are free to choose the appropriate point and nonpoint source controls that will result in reducing phosphorus loads to the target concentration.

ARTICLE 3
CONTROL AND MONITORING MEASURES

3.1 Specific actions and targeted areas will be identified by each Party in the context of their respective ongoing phosphorus reduction efforts to support the Lake Champlain Basin Program's common objectives to restore and protect Lake Champlain and its surrounding watershed.

3.2 To facilitate the tracking and reporting of progress toward attaining the target concentration and previous target loading reductions, the Parties agree to maintain phosphorus monitoring of Missisquoi Bay tributaries and wastewater effluent from treatment facilities in the watershed.

3.3 The Parties will maintain consistent evaluation and reporting methods. The Parties will also share progress on monitoring, source load reduction, and best management practices implemented in the watershed.

ARTICLE 4
IMPLEMENTATION

4.1 To fulfill this Agreement, the Parties agree to each designate a person as liaison for the implementation of the terms of this Agreement and ensure an active permanent representation within the Agreement framework.

4.2 These designees must be in a position to:

a) facilitate support of core monitoring activities and evaluate short-term

opportunities to enhance phosphorus monitoring in Missisquoi Bay waters as they arise;

b) ensure that their respective jurisdiction maintains consistent evaluation and reporting methods for tracking load reductions, including nonpoint source best management practices implemented in the watershed;

c) propose appropriate means to facilitate common work between the Parties to progress towards phosphorus reduction targets; and

d) report every two (2) years to the Lake Champlain Basin Program Steering Committee on their jurisdiction activities and progress towards attaining the reduction goals.

ARTICLE 5
FINAL PROVISIONS

This Agreement shall enter into force on the date of the last signature of the Parties. It will remain in force until any of the Parties provide six (6) months' notice in writing to the other Party to rescind or terminate the Agreement. Further, this Agreement may be amended or modified at any time upon the written agreement of both Parties.

This Agreement continues the purpose of the Agreement between the Gouvernement du Québec and the Government of the State of Vermont concerning phosphorus reduction in Missisquoi Bay signed in Québec City on August 26, 2002 and expired on December 31, 2016.

Done in duplicate in the English and French languages, both texts being equally authentic.

FOR THE GOUVERNEMENT DU QUÉBEC

At Quebec, on march 25 2021

Benoit Charette
Minister of the Environment and the Fight against Climate Change

FOR THE STATE OF VERMONT

At Vermont, on April 21 2021

Julia S. Moore, PE
Secretary of the Agency of Natural Resources

MEMORANDUM OF UNDERSTANDING

BETWEEN THE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,
NATIONAL PARK SERVICE,
NATURAL RESOURCES CONSERVATION SERVICE,
UNITED STATES ARMY CORPS OF ENGINEERS,
UNITED STATES FISH AND WILDLIFE SERVICE,
UNITED STATES FOREST SERVICE,
UNITED STATES GEOLOGICAL SURVEY, AND

FOR

COOPERATION AND COORDINATION TO IMPLEMENT

OPPORTUNITIES FOR ACTION:
AN EVOLVING PLAN FOR THE FUTURE OF THE LAKE CHAMPLAIN BASIN

Whereas in 1990 Congress passed the Lake Champlain Special Designation Act in Title III of the Great Lakes Critical Programs Act of 1990, which authorized establishment of the Lake Champlain Management Conference to develop a comprehensive plan and provided funding, administered through the Environmental Protection Agency (EPA) to support these activities, and

Whereas the Daniel Patrick Moynihan Lake Champlain Basin Program Act of 2002 reauthorized and amended Title III of the Great Lakes Critical Programs Act of 1990, and

Whereas *Opportunities for Action*[1], was completed in 1996 and signed by the Governors of New York and Vermont and the Regional Administrators of Environmental Protection Agency Regions 1 and 2, and

Whereas *Opportunities for Action* was amended in 2010[2], and

Whereas *Opportunities for Action* identifies priority actions to restore and protect water quality and the diverse natural and cultural resources of the Lake Champlain Basin, and

Whereas the Lake Champlain Basin Program is a partnership of federal, state, and local agencies,

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[1]Lake Champlain Basin Program. 1996. Opportunities for Action: An evolving plan for the future of Lake Champlain. 92 pages.

[2] Lake Champlain Basin Program. 2010. Opportunities for Action: An evolving plan for the future of Lake Champlain. 128 pages.

organizations, businesses, academics, farmers and individuals working together to protect and restore Lake Champlain and its Basin as outlined in *Opportunities for Action*, and

Whereas *Opportunities for Action* charges the Lake Champlain Steering Committee and its subcommittees, including representatives of several of the signatory agencies on this Memorandum of Understanding, with the responsibility for overseeing activities of the Lake Champlain Basin Program and for guiding and coordinating among partners to encourage implementation of *Opportunities for Action,* and

Whereas the Lake Champlain Basin Program's Federal agencies recognize the benefits to be obtained by effective cooperation and coordination, and

Whereas the Lake Champlain Federal Work Group was established as a subcommittee of the Lake Champlain Steering Committee in 2001 to provide a framework for cooperation and coordination between Federal agencies,

NOW THEREFORE, because it is in the public interest that Federal agencies continue to work together through mutual cooperation and coordination to ensure timely, efficient use of Federal capability, this Memorandum of Understanding establishes a formal agreement to facilitate implementation of priority actions identified in *Opportunities for Action: An evolving plan for the future of the Lake Champlain Basin.* In accordance with this Memorandum of Understanding, the Federal agencies intend to cooperate in accordance with the following terms and conditions.

Article 1. Authority. EPA enters into this Memorandum of Understanding pursuant to Section 104 of the Clean Water Act, which authorizes EPA to encourage and cooperate with, and render technical services to, individuals, as well as public and private sector entities, including but not limited to federal entities, to promote the coordination and acceleration of training related to the causes, effects, prevention, and elimination of water pollution.

Article 2. Lake Champlain Federal Work Group. The Lake Champlain Federal Work Group will continue to operate as a subcommittee of the Lake Champlain Steering Committee.

A. Work Group Membership. The members of the Work Group shall be appointed by appropriate authorities in each agency.

B. Meetings. The Federal agencies anticipate that the Work Group shall meet periodically at the convenience of the members to review the status of their activities in the Lake Champlain Basin, to assess future work that each agency may be conducting in the Basin, to coordinate with the Lake Champlain Basin Program budget process, and to identify opportunities for cooperative and/or collaborative work to implement priority actions in *Opportunities for Action*.

C. Record of Meetings. Following the conclusion of each meeting, the Federal agencies expect that a memorandum will be prepared to record the matters discussed and agreements reached. This memorandum will be provided to the Steering Committee.

D. Annual Summary. The Federal Agencies expect that the Work Group will develop an

annual summary consisting of a brief description of each agency's accomplishments in the previous year.

Article 3. Limitations

A. All commitments made in this Memorandum of Understanding are subject to the availability of appropriated funds and each Federal agency's priorities. Nothing in this Memorandum of Understanding, in and of itself, obligates the Federal agencies to expend appropriations or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation. Each Federal agency agrees that it will not to submit a claim for compensation for services rendered to in connection with any activities it carries out in furtherance of this Memorandum of Understanding.

B. This Memorandum of Understanding is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between the parties to this Memorandum of Understanding will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of each Federal agency.

C. This Memorandum of Understanding does not create any right or benefit, substantive or procedural, enforceable by law or equity against the Federal agencies, their officers or employees, or any other person. This Memorandum of Understanding does not direct or apply to any person outside the Federal agencies.

D. Nothing in this Memorandum of Understanding shall be interpreted to modify or limit the rights and authorities of the Federal agencies or restrict them from participating in similar activities or arrangements with other public and private agencies, organizations, or individuals.

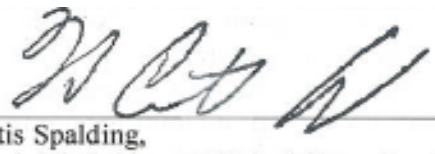
Article 4. Modification/Duration/Termination

A. This Memorandum of Understanding shall remain in effect for five years from the date of the last signature or until modified by mutual written agreement of the Federal agencies. It may be renewed by mutual agreement of the Federal agencies at the end of five years.

B. Any Federal agency may terminate its participation in this Memorandum of Understanding, in whole or in part, at any time by providing written notice to the other Federal agencies at least 90 days in advance of the desired termination date.

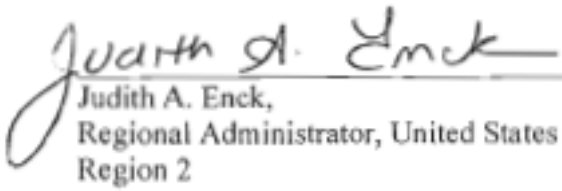
12/31/12

Wendi Weber, Date
Regional Director, United States Fish and Wildlife Service



12/21/12

H. Curtis Spalding, Date
Regional Administrator, United States Environmental Protection Agency
Region 1, New England



3/5/13

Judith A. Enck, Date
Regional Administrator, United States Environmental Protection Agency
Region 2

3/11/13

Colleen Pelles Madrid, Date
Supervisor, USDA Forest Service, Green Mountain National Forest

Nov. 27, 2012

Vicky M. Drew, Date
Vermont State Conservationist, USDA Natural Resources Conservation Service

9/12/12

Donald J. Pettit, Date
New York State Conservationist, USDA Natural Resources Conservation Service

15 oct 2013

Col. Paul E. Owen, Date
Commander, NY District, U.S. Army Corps of Engineers

1/15/13

Michael Creasey, Date
Superintendent, Marsh Billings Rockefeller National Historical Park, National Park Service

Jan. 7, 2013

David P. Russ,
Regional Director for the Northeast, U.S. Geological Survey Date

APPENDICES

Note, the following appendices are not a formal portion of the Memorandum of Understanding, but are attached for informational purposes only.

APPENDIX I - Lake Champlain Steering Committee

The Lake Champlain Steering Committee is responsible for overseeing activities of the Lake Champlain Basin Program. Its members all have a keen interest in Lake Champlain and include representatives from New York and Vermont State agencies, the Province of Quebec, Federal agencies including Department of the Interior, Department of Agriculture, U.S. Army Corps of Engineers, and Environmental Protection Agency, citizen representatives and local government representatives.

The Steering Committee created a Technical Advisory Committee composed of professionals from academia, management agencies, and others. Federal agencies represented on the TAC include the U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. EPA Regions 1 and 2 (non-voting) and Natural Resources Conservation Service. The TAC has the following functions:

- Presents the Steering Committee with technical information to be used for decision-making.
- Advises the Steering Committee about emerging management issues and prepares research or action to address those issues.
- Oversees and facilitates the technical aspects of implementation projects.
- Interprets monitoring program results and other technical information to help determine success or redirection of projects.

The Lake Champlain Steering Committee also created an Education and Outreach Committee to help educate the public on issues facing the Lake, publicize activities occurring in the Basin and gather input from citizens of the Basin, and an Executive Committee to oversee the day to day activities of the Lake Champlain Basin Program.

The Lake Champlain Steering Committee is responsible for recommending how the Lake Champlain Basin Program's funds are spent, including funds from Federal sources. The Steering Committee also evaluates activities of all the Lake Champlain Basin Program partners to ensure the maximum practicable and effective use of member agencies' public funding for high priorities within *Opportunities for Action*.

APPENDIX II - Statement of mutual goals and responsibilities

U.S. Environmental Protection Agency

The mission of the EPA is to protect human health and to safeguard the natural environment — air, water, and land — upon which life depends.

EPA's purpose is to ensure that:

- All Americans are protected from significant risks to human health and the environment where they live, learn and work.
- National efforts to reduce environmental risk are based on the best available scientific information.
- Federal laws protecting human health and the environment are enforced fairly and effectively.
- Environmental protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy.
- All parts of society—communities, individuals, business, state and local governments, tribal governments—have access to accurate information sufficient to effectively participate in managing human health and environmental risks.
- Environmental protection contributes to making our communities and ecosystems diverse, sustainable and economically productive.
- The United States plays a leadership role in working with other nations to protect the global environment.

Both EPA New England in Boston, Massachusetts and EPA Region Two in New York, New York have been actively involved with the Lake Champlain Basin Program since its inception in 1990. These offices have worked to provide grant funds and technical expertise to help advance environmental education and preserve and enhance the basin's ecological function.

U.S. Department of the Interior

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service is authorized to provide assistance to and cooperate with Federal agencies to protect and increase fish and wildlife resources under the Fish and Wildlife Coordination Act. The Fish and Wildlife Service's mission is to conserve, protect, and enhance the Nation's fish and wildlife and their habitats for the continuing benefit of people. Its major responsibilities include conservation and management of

migratory birds, threatened and endangered species, Fish and Wildlife Service lands, and interjurisdictional fisheries. In carrying out these responsibilities, the Fish and Wildlife Service operates several facilities active in the Lake Champlain Basin including the Lake Champlain Fish and Wildlife Resources Office, Dwight D. Eisenhower National Fish Hatchery, New England Ecological Services Field Office, New York Ecological Services Field Office and Missisquoi National Wildlife Refuge.

National Park Service

The National Park Service is responsible for managing a variety of national and international programs designed to help extend the benefits of natural and cultural resource conservation and outdoor recreation. In 2006, Congress designated and authorized the Champlain Valley National Heritage Partnership (CVNHP), as a new National Heritage Area. The Lake Champlain Basin Program was designated the management entity for the CVNHP, with support from the Northeast Regional Office of the NPS. In 2011, Interior Secretary Salazar visited the LCBP and announced approval of the CVNHP Management Plan. The CVNHP special liaison to the NPS is the Superintendent of the Marsh Billings Rockefeller National Historical Park, in Woodstock, VT, who also is a member of the LCBP Steering Committee. From fiscal 1991 to 2011, the National Park Service provided over $2.5 million to the Lake Champlain Basin Program to assist with recreation and cultural resource programs, including the Champlain Quadricentennial, and the operations of the CVNHP.

United States Geological Survey

The U.S. Geological Survey is responsible for providing reliable information and technology to describe and understand the Nation's earth and biological resources and to minimize the impacts of natural hazards. Functions of USGS include: sponsoring and conducting research in geology, hydrology, biology, cartography, and related sciences; coordinating Federal activities in the establishment and maintenance of geologic, hydrologic, biologic and cartographic databases; developing and applying technology for evaluating natural hazards associated with flooding, drought, earth movements, and the behavior of toxic materials in the environment; developing information and technologies to support the management of the Nation's water, biological, energy and mineral resources and to enhance our quality of life; and developing technology for, and producing geographic, cartographic and remotely sensed information in graphic and digital forms.

In the Lake Champlain basin, the USGS has Water Science Center offices in Vermont and New York that focus on hydrologic and water-quality data collection and analyses, and geospatial liaison positions for Vermont and New York that address the development of digital spatial data. Also, the USGS has the Vermont Cooperative Fish and Wildlife Research Unit of the USGS Cooperative Research Units program, which conducts ecologically-based research addressing aquatic and terrestrial components of the basin.

United States Department of Agriculture

Natural Resources Conservation Service

The NRCS improves the health of our Nation's natural resources while sustaining and enhancing the productivity of American agriculture. We achieve this by providing voluntary assistance through strong partnerships with private landowners, managers, and communities to protect, restore, and enhance the lands and waters upon which people and the environment depend.

Originally established by Congress in 1935 as the Soil Conservation Service (SCS), NRCS has expanded to become a conservation leader for all natural resources, ensuring private lands are conserved, restored, and more resilient to environmental challenges, like climate change. Seventy percent of the land in the United States is privately owned, making stewardship by private landowners absolutely critical to the health of our Nation's environment. NRCS works with landowners through conservation planning and assistance designed to benefit the soil, water, air, plants, and animals that result in productive lands and healthy ecosystems. NRCS believes that voluntary, incentive-based conservation is the best way to achieve positive environmental results.

NRCS in Vermont and New York work within a well established conservation partnership. The partnership has a long history of advocating resource protection in the Lake Champlain Basin. In cooperation with State agencies it has actively pursued a program of non-point source phosphorus and sediment reduction from agricultural sources. A variety of voluntary programs providing financial and technical assistance have been made available to basin farmers. USDA and the States of Vermont and New York provide a unique opportunity to farmers in the Lake Champlain Basin by combining state and federal funds on many projects. This has increased farmer participation by decreasing their share of project costs. Over the last ten years NRCS has provided an estimated $100,000,000 for the implementation of water quality related practices in the Lake Champlain Basin; matching funds provided by farmers, other private landowners and state agencies. The State Conservationists of Vermont and New York are members of the LCBP Steering Committee.

Forest Service

The phrase "Caring for the Land and Serving People" captures the Forest Service mission. As set forth in law, the mission is to achieve quality land management under sustainable multiple-use management to meet the diverse needs of the people.

The Green Mountain National Forest manages approximately 91,330 acres (37,888 hectares) of headwater lands in the Lake Champlain basin. With its large blocks of land in remote areas, the GMNF is particularly well suited to provide opportunities for backcountry recreation and Wilderness. Forest goals include:

- The management of watersheds in order to protect municipal water supplies, provide adequate flood control, ensure high water quality, sufficient quantity and benefit important fish and wildlife habitats.
- The preservation and enhancement of the diversity of plant and animal communities on the GMNF so that it is at least as great as that which would be expected in a natural forest.
- To provide a full range of high quality recreational opportunities which are in harmony with the other resources and uses which the GMNF manages.
- The coordination of GMNF activities with goals and activities of the State of Vermont, regional planning commissions, town governments, conservation groups and neighboring landowners.

United States Army Corps of Engineers

The United States Army Corps of Engineers' civil mission, to develop and manage the Nation's water resources, provides local communities and sponsors with opportunities to meet water resource needs where there is both a local and national interest. The Corps is committed to improving navigation in rivers and harbors, reducing flood damages, restoring degraded ecosystems, reducing hurricane and storm damages and various other water resource needs.

Through Section 542 of the Water Resource and Development Act, the Corps and the LCBP have developed a joint management plan through which the Corps works directly with local communities on ecosystem restoration projects recommended by the LCBP. Several Corps programs are available to the Lake Champlain Basin Program in order to meet water resource needs within Lake Champlain and its basin. The Corps is bound to observe existing laws and regulations and conduct project planning and implementation in a prescribed objective manner.

SEC. 120. LAKE CHAMPLAIN BASIN PROGRAM.

(a) ESTABLISHMENT.—

(1) IN GENERAL.—There is established a Lake Champlain Management Conference to develop a comprehensive pollution prevention, control, and restoration plan for Lake Champlain. The Administrator shall convene the management conference within ninety days of the date of enactment of this section.

(2) IMPLEMENTATION.—The Administrator—

(A) may provide support to the State of Vermont, the State of New York, and the New England Interstate Water Pollution Control Commission for the implementation of the Lake Champlain Basin Program; and

(B) shall coordinate actions of the Environmental Protection Agency under subparagraph (A) with the actions of other appropriate Federal agencies.

(b) MEMBERSHIP.—The Members of the Management Conference shall be comprised of—

(1) the Governors of the States of Vermont and New York;

(2) each interested Federal agency, not to exceed a total of five members;

(3) the Vermont and New York Chairpersons of the Vermont, New York, Quebec Citizens Advisory Committee for the Environmental Management of Lake Champlain;

(4) four representatives of the State legislature of Vermont;

(5) four representatives of the State legislature of New York;

(6) six persons representing local governments having jurisdiction over any land or water within the Lake Champlain basin, as determined appropriate by the Governors; and

(7) eight persons representing affected industries, nongovernmental organizations, public and private educational institutions, and the general public, as determined appropriate by the trigovernmental Citizens Advisory Committee for the Environmental Management of Lake Champlain, but not to be current members of the Citizens Advisory Committee.

(c) TECHNICAL ADVISORY COMMITTEE.—(1) The Management Conference shall, not later than one hundred and twenty days after the date of enactment of this section, appoint a Technical Advisory Committee.

(2) Such Technical Advisory Committee shall consist of officials of: appropriate departments and agencies of the Federal Govern-

ment; the State governments of New York and Vermont; and governments of political subdivisions of such States; and public and private research institutions.

(d) RESEARCH PROGRAM.—The Management Conference shall establish a multi-disciplinary environmental research program for Lake Champlain. Such research program shall be planned and conducted jointly with the Lake Champlain Research Consortium.

(e) POLLUTION PREVENTION, CONTROL, AND RESTORATION PLAN.—(1) Not later than three years after the date of the enact- ment of this section, the Management Conference shall publish a pollution prevention, control, and restoration plan for Lake Cham- plain.

(2) The Plan developed pursuant to this section shall—

(A) identify corrective actions and compliance schedules addressing point and nonpoint sources of pollution necessary to restore and maintain the chemical, physical, and biological integrity of water quality, a balanced, indigenous population of shellfish, fish and wildlife, recreational, and economic activities in and on the lake;

(B) incorporate environmental management concepts and programs established in State and Federal plans and programs in effect at the time of the development of such plan;

(C) clarify the duties of Federal and State agencies in pollution prevention and control activities, and to the extent allowable by law, suggest a timetable for adoption by the appropriate Federal and State agencies to accomplish such duties within a reasonable period of time;

(D) describe the methods and schedules for funding of programs, activities, and projects identified in the Plan, including the use of Federal funds and other sources of funds;

(E) include a strategy for pollution prevention and control that includes the promotion of pollution prevention and management practices to reduce the amount of pollution generated in the Lake Champlain basin; and

(F) be reviewed and revised, as necessary, at least once every 5 years, in consultation with the Administrator and other appropriate Federal agencies.

(3) The Administrator, in cooperation with the Management Conference, shall provide for public review and comment on the draft Plan. At a minimum, the Management Conference shall con- duct one public meeting to hear comments on the draft plan in the State of New York and one such meeting in the State of Vermont.

(4) Not less than one hundred and twenty days after the publication of the Plan required pursuant to this section, the Administrator shall approve such plan if the plan meets the requirements of this section and the Governors of the States of New York and Vermont concur.

(5) Upon approval of the plan, such plan shall be deemed to be an approved management program for the purposes of section 319(h) of this Act and such plan shall be deemed to be an approved comprehensive conservation and management plan pursuant to section 320 of this Act.

(f) GRANT ASSISTANCE.—(1) The Administrator may, in consultation with participants in the Lake Champlain Basin Program,

make grants to State, interstate, and regional water pollution control agencies, and public or nonprofit agencies, institutions, and organizations.

(2) Grants under this subsection shall be made for assisting research, surveys, studies, and modeling and technical and sup- porting work necessary for the development and implementation of the Plan.

(3) The amount of grants to any person under this subsection for a fiscal year shall not exceed 75 per centum of the costs of such research, survey, study and work and shall be made available on the condition that non-Federal share of such costs are provided from non-Federal sources.

(4) The Administrator may establish such requirements for the administration of grants as he determines to be appropriate.

(g) DEFINITIONS.—In this section:

(1) LAKE CHAMPLAIN BASIN PROGRAM.—The term "Lake Champlain Basin Program" means the coordinated efforts among the Federal Government, State governments, and local governments to implement the Plan.

(2) LAKE CHAMPLAIN DRAINAGE BASIN.—The term "Lake Champlain drainage basin" means all or part of Clinton, Franklin, Warren, Essex, and Washington counties in the State of New York and all or part of Franklin, Hamilton, Grand Isle, Chittenden, Addison, Rutland, Bennington, Lamoille, Orange, Washington, Orleans, and Caledonia coun- ties in Vermont, that contain all of the streams, rivers, lakes, and other bodies of water, including wetlands, that drain into Lake Champlain.

(3) PLAN.—The term "Plan" means the plan developed under subsection (e).

(h) NO EFFECT ON CERTAIN AUTHORITY.—Nothing in this section—

(1) affects the jurisdiction or powers of—

(A) any department or agency of the Federal Government or any State government; or

(B) any international organization or entity related to Lake Champlain created by treaty or memorandum to which the United States is a signatory;

(2) provides new regulatory authority for the Environmental Protection Agency; or

(3) affects section 304 of the Great Lakes Critical Pro- grams Act of 1990 (Public Law 101–596; 33 U.S.C. 1270 note).

(i) AUTHORIZATION.—There are authorized to be appropriated to the Environmental Protection Agency to carry out this section— (1) $2,000,000 for each of fiscal years 1991, 1992, 1993, 1994, and 1995;

(2) such sums as are necessary for each of fiscal years 1996 through 2003; and

(3) $11,000,000 for each of fiscal years 2004 through 2008.

(33 U.S.C. 1270)

The Lake Champlain Basin Program (LCBP) coordinates and funds efforts that benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources. The program works in partnership with federal agencies; state and provincial agencies from New York, Québec, and Vermont; local communities; businesses; and citizen groups. These partners lead collaborative actions to address water quality and environmental challenges that cross political boundaries in a multinational watershed.

The LCBP was created by the Lake Champlain Special Designation Act of 1990, which named Lake Champlain as a resource of national significance. The LCBP was charged with developing and implementing a comprehensive and coordinated plan for protecting the Lake Champlain Basin. The LCBP works closely with program partners to implement management goals outlined in *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin.*

The Lake Champlain Steering Committee guides the LCBP's work. Its members include staff from the U.S. Environmental Protection Agency and several other U.S. federal agencies, state and provincial governments in New York, Québec, and Vermont; local governments; and Lake Champlain Sea Grant. The chairpersons of the LCBP's Technical Advisory Committee, Heritage Area Program Advisory Committee, Education and Outreach Advisory Committee, and Citizen Advisory Committees also serve on the Steering Committee.

The LCBP receives funding from the U.S. Environmental Protection Agency, the Great Lakes Fishery Commission, and the U.S. National Park Service. NEIWPCC manages the LCBP's financial, contractual, and human resources business operations on behalf of the Lake Champlain Steering Committee. LCBP staff are employees of NEIWPCC. NEIWPCC is a regional commission that helps the states of the Northeast preserve and advance water quality.

Visit www.lcbp.org to view the full version of *Opportunities for Action.*

Lake Champlain Basin Program
54 West Shore Road
Grand Isle, VT 05458
(802) 372-3213
www.lcbp.org

Lake Champlain Basin Program

NEIWPCC