January 26, 2017

Dear Interested Lake Champlain Basin Stakeholder,

Today the Lake Champlain Basin Program released a draft *Opportunities for Action,* LCBP's management plan for Lake Champlain. Public comments on the plan will be accepted via electronic mail (ofaonline@lcbp.org) through March 6, 2017. Comments may also be submitted in hardcopy to the LCBP, 54 West Shore Road, Grand Isle, Vermont 05458.

While the states of New York and Vermont both have TMDLs to reduce phosphorus and other water quality parameters from a regulatory perspective, the LCBP focuses on regional non-regulatory education efforts, project implementation and scientific research with New York, Vermont and Québec. Since 1991, Lake Champlain's ecosystem issues have changed over time including concerns with invasive species and cyanobacteria, but high phosphorus levels have remained a constant. Each iteration of *Opportunities for Action* has evolved as new concerns emerge. The Congressional legislation for the LCBP also highlights the regional connection to our unique cultural heritage and lake recreational opportunities and this, too, is reflected in *Opportunities for Action*.

The four primary goals of *Opportunities for Action* are to identify priorities that will help move Lake Champlain toward clean water, healthy ecosystems, thriving communities, and a better informed and involved public that understands Lake Champlain and its watershed.
"This is the fourth version of Opportunities for Action to be released since the LCBP's inception in 1991. We recognize there are many organizations working toward meeting common management goals for Lake Champlain. This draft plan is intended to highlight what will be the priorities of the LCBP in addressing management issues across the Lake Champlain watershed for the next five years," said Dr. Eric Howe, Director of the LCBP and Champlain National Valley Heritage Partnership. Howe continued, "The plan will focus LCBP efforts on data sharing, coordination of research programs across multiple organizations, restoration and protection of critical areas in our landscape, interpreting the rich history and cultural resources of the Champlain Valley, and working with partners to extend this information to the public to help guide public actions toward a cleaner, healthier, and more resilient Lake Champlain."

The following is a draft document made available by the LCBP for public comment. The final draft, to be released in late spring 2017, will be formatted for content, style, and readability.

LCBP is coordinating with the three jurisdictional Citizen Advisory Committees in the Basin to review the priorities in the draft Plan, on the following dates:

January 30, 2017
New York Citizens Advisory Committee
1:00 PM
Community Room, Plattsburgh City Hall, Plattsburgh, NY

February 13, 2017
Vermont Citizens Advisory Committee on Lake Champlain's Future
5:00 PM
The Shelburne Town Offices Meeting Room 1, Shelburne, VT

February 20, 2017
Québec Citizens Advisory Committee on Lake Champlain's Future
8:00 PM
MRC Brome-Missisquoi, Cowansville, QC

For further information, please contact the Lake Champlain Basin Program, 54 West Shore Road, Grand Isle, VT at (802) 372-3213 or (800) 468-5227.

Thank you for your interest and participation in helping to improve the condition of the Lake Champlain Basin.

Sincerely yours,

Eric Howe, Ph.D.
Director, Lake Champlain Basin Program

Opportunities for Action 2017 Outline

- Introduction
    - Overview of Issues, History and Geography
    - Special Designation Act
    - LCBP Mission Statement
    - Addressing the Issues: Opportunities for Action
    - Key Functions of OFA:
        - Coordinate Programs and Implementation Activities
        - Involve the Public and Support Local Level Implementation
        - Measure and Monitor Success Relative to Benchmarks
        - Promote and Advise Partner Communications
        - Secure and Direct Funding
        - Conduct Sound Research
        - Regularly Update Plan Recommendations
        - Objectives, Strategies, Task Areas and Outcomes
    - Management Themes:
        - Holistic Watershed Approach
        - Resilience to Climate Change
        - Collaborative Science-Driven Management
        - Integration of the Environment and the Economy
    - Explanation of Progress Tracking Metrics and Ecosystem Indicators

- Goal I: Clean Water
- Goal II: Healthy Ecosystems
- Goal III: Thriving Communities
- Goal IV: Informed and Involved Public
- References/Glossary/Acronyms
- Appendices
    - I. Strategy for Implementing the Plan
        - LCBP Role and Structure
        - Partners in Action
    - II. LCBP Accomplishments Since 2010 OFA
    - III. Key Partner Publications and Tracking Databases
    - IV. List of LCBP Advisory Committee Members
    - V. MOUs

Introduction

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. Many 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. The Lake, at 120 miles (193 km) long and more than 400 feet (122 m) deep, supports a complex freshwater ecosystem with diverse plant and animal species. Many challenges exist to protecting the watershed's ecosystem functions so that it is best prepared to adapt to continuing climate change and the impacts of society. 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.

The biological riches of the basin and 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.

RESOURCE ISSUES FACING LAKE CHAMPLAIN

Although Lake Champlain remains a vital lake with many assets, several serious environmental problems demand action. High phosphorus levels, toxic substances and pathogens, and aquatic invasive species threaten the Lake ecosystem and 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.

THE LAKE CHAMPLAIN SPECIAL DESIGNATION ACT

On November 5, 1990, the ***Lake Champlain Special Designation Act*** was signed into law [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. Its 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, wetlands, wildlife, recreational, and cultural resource 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. 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 per year to accomplish this goal [www.lcbp.org/PDFs/H.R.1070_LCBPAuthorization_2002.pdf].

The Special Designation Act created the Lake Champlain Basin Program (LCBP), a nonregulatory partnership among the States of New York and Vermont, the Province of Québec, the US Environmental Protection Agency, other federal and local government agencies, and many public and private local groups. 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 program is guided by the Lake Champlain Steering Committee, a board comprised of a broad spectrum of representatives of government agencies and the non-governmental chairs of advisory groups representing citizen Lake users, scientists, and educators. During the past two decades, the LCBP has sponsored a great variety of projects supported with more than $7 million and 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 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.

GREAT LAKES FISHERY COMMISSION

In addition to the funding appropriated to LCBP through Section 120 of the Clean Water Act, LCBP also receives support from the Great Lakes Fishery Commission. 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. When sea lamprey were recognized as a nuisance species in Lake Champlain, this 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 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 researchers at the University of Vermont.

CHAMPLAIN VALLEY NATIONAL HERITAGE PARTNERSHIP

The Champlain Valley National Heritage Partnership (CVNHP) was established in 1996 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 via the U.S. Department of Interior budget, which is determined by the U.S. Congress. Between 2008 and 2016, the CVNHP has received a total of $2 million in funding. In that time, the CVNHP has awarded 58 grants totaling $309,394 for proposals that supported the Champlain Quadricentennial, the anniversary of the War of 1812 and the American Civil War, educational programs, new water trails, and support for highlighting the interpretive themes of the CVNHP. The return on these grants has been outstanding: between 2008-2015, $246,896 in grant funding garnered $667,537 in non-federal match.

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. This resource is to be used as a strategic planning guide, to inform management decisions over the next several years. The broader community of governments, organizations, watershed groups, academic institutions, and other lake-user groups can use this plan 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 chairs 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 by and large people want to have a lake that is suitable for recreation, fish that are safe to eat, and one that provides a clean source of drinking water that is safe and reliable. 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, and the cleanliness of lakes that serve as drinking water supplies. Invasive species severely 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 period of the lake, increasing the prevalence of algal blooms, improving conditions for some species, and reducing the quality of the ecosystem for others. The broader themes of this plan address some of these “aspirational goals” – 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, for the enjoyment of future generations.

The LCBP, in partnership with many government agencies, works toward accomplishing these broad goals, but resources are limited. Achievement of these goals will require more than what the LCBP and government partners, watershed groups, and local stakeholder groups can bring to the table. Broad societal changes in the way we think and act as communities, as businesses, and as individuals working and living within the Lake Champlain watershed will be required. Societal shifts such as connecting people to the lake and to its watershed by changing the way we act and 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 each one of us that lives in the watershed can take actions to reduce our contribution of runoff and nutrient pollution, we can collectively work toward a healthy and resilient lake ecosystem that can support the human and natural communities we enjoy. We must think carefully about how we support programs that benefit the lake through different funding streams, and how these programs can be sustained. We need to think about our educational system, and how we teach our youngest and our oldest students about their individual and collective impacts to the lake, with emphasis on water conservation, quality, and management through individual actions.

In *Opportunities for Action*, the Lake Champlain Basin Program has identified a suite of task areas to address these concerns, although they alone may not achieve these broad aspirational goals. We hope that by using sound science to address these task areas, we can implement effective clean water practices that will provide future generations with a Lake Champlain in which they can swim, fish, and enjoy life.

Plan implementation includes coordinating state, federal, and provincial programs for the protection and restoration of Lake Champlain; assuring that the public is involved in Lake issues; and building local support through nongovernmental organizations and municipalities. Long-term monitoring of the Lake Champlain ecosystem's health and measuring the success or weaknesses of the plan are of paramount importance. Implementation must also provide a means of educating legislative bodies and interest groups about the science behind lake issues to ensure these groups are accurately informed during their policy development and funding decision processes.

Many cooperating agencies, organizations, and individuals have contributed their time, knowledge, and commitment to producing a comprehensive pollution prevention, control, and restoration plan to guide the allocation of LCBP resources to improve the condition of Lake Champlain. 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 VT 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. The result of these many efforts, *Opportunities for*

Action – an evolving plan for the future of the Lake Champlain Basin (2016), outlines priority goals and strategies for the LCBP in protecting and enhancing the environmental, cultural, recreational, and economic activities of or relating to the Lake.

The jurisdictions governing the Lake Champlain Basin – the governments of Québec, New York, Vermont, and US federal agencies have specific statutory requirements to establish and to achieve water quality standards. They each also have the ability to raise revenue and to enforce laws that accomplish these responsibilities. For example, the achievement of numeric phosphorous load reductions to achieve in-lake concentration standards are established as jurisdictional obligations in Vermont and New York. LCBP's congressional authorizations provide a mechanism for LCBP to serve an important role in supporting the goals of the States to meet numeric standards and to facilitate collaboration among the many agencies responsible for meeting common goals.

The ***Special Designation Act*** of 1990, and *Opportunities for Action* (all versions from 1996 through 2016), have supported the role of the LCBP to regularly bring together jurisdictional partners from Vermont, New York, Québec, numerous U.S. federal agencies (and others) to examine, debate and coordinate the environmental management of Lake Champlain and its watershed. 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 to protect and restore the water quality of the lake. The Lake Champlain Steering Committee strives to allocate funds annually to support:

- long-term monitoring of water resources basin-wide,
- 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 Atlas and operation of the LCBP Resource Room at the ECHO Leahy Center for Lake Champlain,
- operational assistance to watershed organizations, and
- heritage and recreational programs consistent with the goals of the Champlain Valley National Heritage Partnership Management Plan (which is incorporated in OFA 2016)

The allocation of LCBP resources, which presently are derived from US EPA, GLFC and NPS funding agreements, is targeted to support high priority tasks of basin-wide importance.

ABORDER 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. 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.

L’ensemble des représentants des divers paliers gouvernementaux, des organisations de bassins versants, des universités et d’autres groupes peut utiliser aussi ce plan. Il peut être utilisé pour suivre les priorités du Comité directeur du lac Champlain et comme référence pour identifier leurs priorités d’interventions afin qu’ils s’harmonisent avec ceux du Comité directeur 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 ainsi que les problèmes de gestion qui doivent être abordés. La prolifération de cyanobactéries est une problématique mondiale qui a un impact sur la qualité de l’eau potable. Les espèces exotiques envahissantes altèrent aussi gravement les écosystèmes lacustres souvent au détriment des loisirs, de l'économie et parfois même de la santé publique. Sans oublier les changements climatiques qui affectent l'écosystème du lac en réduisant la couverture de glace et en prolongeant la période de productivité biologique du lac. Les changements climatiques augmentent la prévalence des proliférations d'algues et améliorent les conditions de certaines espèces au détriment de d’autres espèces. Les thèmes généraux de ce plan visent certains de ces «objectifs ambitieux» notamment la réduction de la fréquence et la toxicité de la prolifération de cyanobactéries, 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 pour le bénéfique des générations futures.

Le LCBP (Programme de mise en valeur du lac Champlain) en partenariat avec de nombreux organismes gouvernementaux travaille à la réalisation de ces objectifs généraux dans un contexte de ressource limitée. L’atteinte de ces objectifs nécessitera des efforts au-delà de la contribution que peuvent apporter les partenaires du LCBP, des gouvernements et des organismes de bassins versants. 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. En effet, le rapport au lac et à son bassin versant est important. La façon dont nous agissons et pensons quotidiennement à l'eau qui coule sur nos toits, nos allées, nos pelouses, les 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. Dans ce contexte, nous devons réfléchir soigneusement à la façon dont nous supportons les programmes et leurs modes de financement. Nous devons aussi revoir la façon d’enseigner à nos jeunes et moins jeunes concernant leurs 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. Nous devrions également apprendre à mieux apprécier et à profiter de la richesse patrimoniale et des multiples possibilités de loisirs que le lac peut offrir.

Dans le cadre de Perspectives d’Action, le LCBP a identifié une série d’actions pour faire face à ces enjeux sachant que ces actions en soit ne peuvent atteindre ces objectifs ambitieux. Nous espérons cependant qu’en mettant l’emphase sur ces secteurs d’interventions, nous pourrons

mettre en œuvre les meilleurs pratiques en matière de gestion de l'eau en fonction de principes scientifiques éprouvés, qui offriront aux générations futures un lac Champlain où ils pourront nager, pêcher et profiter de la vie.

La mise en œuvre du plan d'action comprend la coordination des programmes nationaux, fédéraux et provinciaux pour la protection et la restauration du lac Champlain. On doit s'assurer de l'implication du public en tout temps et du support du milieu via les organisations non gouvernementales et des municipalités. Notons aussi que le suivie à long terme de l'état de l'écosystème du lac Champlain pour l'évaluation du progrès de la mise en œuvre du plan est d'une importance primordiale. La mise en œuvre doit également fournir un moyen d'informer les législations et les groupes d'intérêt des enjeux sur des bases scientifiques afin de s'assurer que tous intervenants soient bien informés dans leurs processus d'élaboration de politiques et de programme de financement.

Plusieurs collaborateurs de diverses agences, d'organismes et de citoyens ont participé à élaborer un plan exhaustif de prévention, de contrôle et de restauration de la pollution du lac Champlain et ont aidé à orienter l'affectation des ressources de la LCBP. Ils ont contribué de leur temps, leurs connaissances et montrer leur engagement tout au long du processus.

L'élaboration de ce plan a été développée en tenant compte des actions des plans de gestion existants, tels que celui du Vermont le *Total Maximun Daily Load* (TMDL) de phosphore du lac Champlain (2016), le Plan d'action d'intervention rapide pour les espèces aquatiques envahissantes (2009) et d'autres documents de planification important. Le résultat de ces nombreux efforts, Perspectives d'Action - un plan en évolution pour l'avenir du bassin du lac Champlain (2016), définit les objectifs et les stratégies prioritaires du LCBP pour l'assainissement du lac et l'amélioration des activités culturelles, récréatives et économiques relié au lac.

Rappelons que les gouvernements du Québec, de New York, du Vermont et des organismes fédéraux américains ont aussi des exigences légales spécifiques pour établir et atteindre les normes de qualité de l'eau. Ils ont chacun également la capacité de générer des revenus et d'appliquer des lois pour assumer leurs responsabilités. Par exemple, l'attente des objectifs de réduction des charges de phosphore pour atteindre les normes de concentration dans le lac est établie par des obligations juridiques au Vermont et à New York. Rappelons aussi que les autorisations du Congrès Américain ne confèrent pas au LCBP la responsabilité d'atteindre ces objectifs de charges spécifiques. Mais ils lui confèrent plutôt un rôle d'assistance pour faciliter la collaboration entre les partenaires des trois juridictions leur permettant d'assumer leurs responsabilités respectives.

La Loi sur la désignation spéciale du lac Champlain de 1990 et Perspectives d'Action (1996 à 2016) ont permis au LCBP de réaliser son mandat de réunir régulièrement les partenaires du Vermont, de New York, du Québec et de nombreux organismes fédéraux américains pour examiner, débattre et coordonner la gestion environnementale du lac Champlain et de son bassin hydrographique. Plusieurs ententes intergouvernementales de gestion du bassin hydrographique du lac Champlain ont bénéficié de l'appui du LCBP. Ce qui a permis d'établir une collaboration transfrontalière exemplaire pour protéger et rétablir la qualité de l'eau du lac.

Le Comité directeur du lac Champlain alloue annuellement des fonds aux secteurs suivant:

- Au suivi à long terme de la qualité de l'eau à l'échelle du bassin,
- À la mise en œuvre du plan avec les intervenants locaux et aux programmes éducatifs,
- Aux projets de prévention de la pollution,
- À la recherche ciblée sur l'environnement,
- À l'interprétation et utilisation des données scientifiques objectives pour informer les gestionnaires des ressources et le public,
- Aux nombreux programmes éducatifs incluant la mise à jour du site du LCBP et de l'Atlas,
- Aux organismes de bassins versant,
- Aux programmes patrimoniaux et récréatifs conformes aux objectifs du Plan de gestion du patrimoine national de la vallée de Champlain (qui est intégré à Perspectives d'Action 2016)

L'affectation des ressources du LCBP qui actuellement découle des ententes de financement de *l'Environmental Protection Agency* (US EPA), de la *Great Lake Ficheries Commission* (GLFC) et du *National Parks Service* (NPS) des États-Unis, vise à appuyer ses mandats hautement prioritaires qui sont d'une grande importance pour l'ensemble du bassin du lac Champlain.

Lake Champlain Basin Program Role and Structure

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 program is guided by the Lake Champlain Steering Committee, a board comprised of a broad spectrum of representatives of government agencies and the chairs of advisory groups representing citizen lake users, scientists, and educators. 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 Gouvernment of Québec*. US 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 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. See Appendix I for more information about the LCBP Operating Structure, Committees (including Committee representation), and Staffing.

KEY FUNCTIONS OF OPPORTUNITIES FOR ACTION

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.

Support Local Level Implementation and Involve the Public

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.

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.

Measure and Monitor Success Relative to Benchmarks

A critical component of watershed planning is monitoring, which 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. Monitoring must also 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.

LCBP will work in collaboration with Federal, State and Provincial partners to track the success of management initiatives. LCBP reports a summary of indicators in the triennial State of the Lake report. Beginning with the completion of the federal fiscal year 2016 (October 2015-September 2016), LCBP will provide an annual report of LCBP-funded accomplishments for our State and Federal partners to use in tracking performance measures within their unique accounting systems. This approach will reduce 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.

Throughout the four major sections within the 2016 plan, "Anticipated Outcomes" are identified for many of the tasks and objectives. These targets reflect anticipated numbers of management interventions, funding for research programs, audiences for outreach campaigns, and recreation goals that LCBP expects to meet over the course of the next five years. 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

One of the roles of the Lake Champlain Basin Program is to ensure that the numerous State, Federal, and Provincial government agencies, as well as non-governmental organizations and academic institutions working on Basin issues are communicating regularly. 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.

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 share and discuss topic-relevant information.

Federal Partners Workgroup

The Lake Champlain Federal Partners Workgroup consists of many of the U.S. Federal agencies working toward management goals of the Lake Champlain watershed. 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 an Memorandum of Understanding include the US EPA, National Park Service (NPS), National 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 U.S. Geological Survey, plus other federal agencies including Lake Champlain SeaGrant (a program within the National Oceanic And Atmospheric Administration). These agencies allocate resources, either in the form of staff time or for programmatic areas including research, monitoring, trainings, infrastructure improvements or for management interventions. The Federal Partners Workgroup MOU will be renewed in 2018; we hope to add new federal agencies to the agreement, such as the Federal Department of Transportation (DOT), USDA-Rural Development, USDA-Farm Services Agency (FSA), Federal Emergency Management Agency (FEMA), Department of Housing and Urban Development (HUD), the Coast Guard, the National Weather Service (NWS) and others. In 2016, LCBP began coordinating communication for this group, facilitating meetings needed. These meetings will bring together staff from many of the State and Federal agencies working toward management of the Lake Champlain watershed. These meetings will provide an opportunity for agency representatives to report on recent projects, discuss upcoming initiatives and funding opportunities, and to 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 Vermont DEC and US EPA Region 1 have called on LCBP to help coordinate and facilitate annual public meetings for the revision of the Vermont portion of the Lake Champlain Total Maximum Daily Load (TMDL). Similarly, the International Joint Commission (IJC) has 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.

Partners often ask LCBP to organize a workgroup or discussion focusing on a specific topic area. One example is coordination and facilitation of a research discussion on nutrient management issues in Missisquoi Bay and its watershed. LCBP resources were used to arrange site facilities for the day, coordinate the meeting, facilitate the conversations during the course of the day, and to provide meeting follow-up information for participants. LCBP anticipates similar requests to facilitate cross-border (bi-state and bi-national) conversations will continue, particularly as concerns about transportation of crude oil via the railways along the shores of Lake Champlain continue or further

development of the lake as a corridor for energy transmission lines continues. LCBP will continue to provide this service for our partners over the course of the next five years.

PARTNERS IN ACTION:

Countless partners – including federal, state, and provincial agencies, watershed and conservation groups, heritage and recreation organizations, and local citizens – are working to prevent pollution and protect, restore, enhance, and enjoy the water quality of the Lake Champlain Basin. While many different groups may work on any given task in order to accomplish a general action, the intent of *OFA* is to provide guidance to Steering Committee and Advisory Committee members who collaborate each year to identify the annual budget priorities and tasks for LCBP to implement in order to restore and protect Lake Champlain. Numerous organizations, agencies, and jurisdictions identified as LCBP partners are primarily guided by their own plans and priorities, such as the Phosphorus TMDL Implementation Plan for Lake Champlain, or The Aquatic Invasive Species Rapid Response Plan, etc. The Lake Champlain Steering Committee, which sets resource management policy and approves budget allocations for the LCBP, is charged, by the authorizing Special Designation Act, with a collaborating and assistive role in coordination with the efforts of other partners. Although the emphasis of *OFA* is on the actions of the LCBP partnership, those actions are intended to improve the knowledge base and encourage positive changes in stewardship behaviors and in the effectiveness of the resident and visitor public, various levels of government, non-governmental organizations, and the private sector in meeting the challenges of protecting the natural resources of the Lake Champlain Basin.

Local Residents and Visitors

The cumulative results of many individual actions make perhaps the greatest difference in the complex issues facing the Lake Champlain Basin. In this context, all members of the public are key partners in implementation of *OFA*. Nearly 600,000 people live, work, and play in the Lake Champlain Basin, which they share with more than six million visitors annually. Underlying all of the actions in the plan is the need for increased public involvement in the care of the Lake and its Basin. Residents of the Basin can and must be involved in the implementation process in many ways. We can change activities in our own households and workplaces, maintain septic systems properly, and reduce the use of toxic chemicals in cleaning and lawn care. We can support local initiatives for action or demand action and leadership in our own communities to address problems where progress is inadequate. We also can volunteer for local boards, monitor their community's activities, and participate in citizen groups advocating for a cleaner Lake. Most importantly, residents can better inform ourselves about caring for their watershed and ensure that our own behavior contributes to improvements. The plan emphasizes education and outreach programs for this reason. Without effective public involvement, the efforts of jurisdictions will not succeed.

Visitors often become involved in implementation of the plan through their support of the economic and environmental integrity of the Basin. The inherent beauty of the Basin is a key attraction for visitors, who often bring a heightened sense of appreciation of the quality of the

natural environment. They spend numerous dollars in the Basin and can act in environmentally sound ways when they are here. Business must work to encourage responsible behavior of their clients, particularly by demonstrating their own commitments and actions to reduce contamination and improve the water quality of the Lake and its Basin.

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 a number of 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.

US Federal Agencies

Many of the activities necessary to implement the plan need to occur at the local level and, to some degree, at the state level. However, environmental restoration in the Lake Champlain Basin often benefits from collaboration and support from federal agencies carrying out restoration projects on the ground. US federal agencies have taken a vital role in providing support for plan implementation in the unique network of partnerships reflected below. 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 of LCBP activities.

- The USEPA provides financial and technical support to the states and 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. They ensure that all Americans are protected from significant risks to human health and the environment where they live, learn, and work.

- The US Department of Agriculture provides financial and technical assistance on best management practices for controlling nonpoint source pollution and especially for preventing pollution from agricultural runoff.

- The US Department of the Interior supports the management plan through three services.
    - The US Fish and Wildlife Service (USFWS) 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 supporting work in the Basin, 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 newly designated Champlain Valley National Heritage Partnership.
    - The US Geological Survey (USGS) provides financial and technical support through stream gauge monitoring and watershed research concerning nutrients and contaminants of concern.

- The US 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 types of projects eligible for assistance include, but are not limited to, river restoration, stormwater management, wetland creation/restoration, watershed plans, planning aid reports, alternatives analyses, invasive species control/removal, and wastewater treatment plant studies. All projects and studies are cost shared 65-35 with a nonfederal partner (any local governmental agency, Indian Tribe, or nongovernmental organization). The non-federal 35 percent share may be provided as in-kind services directly related to the task or as cash.

  The USACE works in partnership with the LCBP to implement the Section 542 program within the Lake Champlain Basin. The LCBP coordinates invitations to and applications from interested parties within the Basin to request USACE assistance in the development of projects under the Section 542 program. The USACE then selects projects ranked highest in priority by the LCBP for implementation, given funding availability. Approved projects are then coordinated solely through the USACE throughout implementation. Additionally, USACE may support projects through the following programs:
    a. Planning Assistance to States (PAS)- USACE can provide assistance in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources. Typical studies are only planning level of detail; they do not include detailed design for project construction. The program can encompass many types of studies dealing with water resources issues. Types of studies conducted in recent years under the program include the following: water supply/demand, water conservation, water quality, environmental/conservation, wetlands evaluation/restoration, dam safety/failure, flood damage reduction, coastal zone protection, economic analysis and harbor planning.
    b. Flood Plain Management Services (FPMS)- USACE can provide the full range of technical services and planning guidance that is needed to support effective flood plain management. General technical assistance efforts under this program includes determining: site-specific data on obstructions to flood flows, flood formation, and timing; flood depths, stages or floodwater velocities; the extent,

duration, and frequency of flooding; information on natural and cultural flood plain resources; and flood loss potentials before and after the use of flood plain management measures. Types of studies have been conducted under the FPMS program include: flood plain delineation/hazard, dam failure analyses, hurricane evacuation, flood warning, floodway, flood damage reduction, stormwater management, flood proofing, and inventories of flood prone structures. Efforts under this program are generally conducted at 100 percent Federal expense, except in those instances where the requestor is another Federal agency or a private party. In those cases the work is conducted on a 100 percent cost recovery basis.

c. Continuing Authorities Program (CAP)- Program allows the USACE to plan, design, and implement certain types of water resources projects without additional project specific congressional authorization. The purpose of the CAP is to plan and implement projects of limited size, cost, scope and complexity. All projects in this program include a feasibility phase and an implementation phase. The feasibility phase is initially federally funded up to $100,000. Any remaining feasibility phase costs are shared 50/50 with the non-Federal sponsor after executing a feasibility cost sharing agreement (FCSA). Implementation cost share is dependent on the Authority and ranges from 75/25 for Section 1135 to 65/35 for Sections 206, 204, and 205. Please contact the New York District office for particulars.
    i. *Section 206- Aquatic ecosystem restoration
    ii. *Section 1135- Project modifications for improvement of the environment
    iii. Section 204- Beneficial uses of dredged material
    iv. Section 205- Flood control
d. Aquatic Plant Control (APC)- USACE can cooperate with other federal and non-federal agencies in comprehensive programs for the control of invasive aquatic plants, which have adverse effects on navigation and the ecosystem. The Aquatic Plant Control (APC) program for the State of Vermont is in the Lake Champlain Basin. Cost Share is 50/50.

In addition to the program-specific authority discussed above, the USACE also has several general and single-project authorities that can provide assistance to Lake Champlain. Please contact the New York District Office for particulars.

- The US 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.

New England Interstate Water Pollution Control Commission (NEIWPCC)

Established by the US Congress in 1947, NEIWPCC is a 501 (c)(3) corporation that also operates under a seven-state compact. NEIWPCC's primary mission is to assist member states (New England and New York) by providing coordination, public education, training, and leadership in the protection of water quality and related work in the region. The role of NEIWPCC in the Lake

Champlain Basin is to conduct the business and financial affairs of the LCBP, including staffing and administration of grants and contracts, according to its rules and procedures. 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 through which the LCBP can assist local governments to address these matters. Key partners likely to implement such actions are Select Boards, 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 local planning and budgeting.

Regional Government Organizations

Protecting Lake Champlain requires cooperation among the communities within its watershed. Watersheds cross town boundaries, and one town acting alone may not be sufficient to address all issues. Protecting the entire Basin demands a high level of attention from all municipalities in the watershed. Regional organizations – such as the county planning offices in New York and the regional planning commissions in Vermont – work with a number of 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.

Legislative Bodies

Legislative bodies in the Basin are responsible for passing laws and appropriating funds for many programs important to the Lake. Where possible, more consistent policies among New York, Québec, and Vermont would be helpful, although this requires extensive cooperation among their legislative bodies. The LCBP will seek opportunities to facilitate that cooperation where possible. Successful implementation also requires that legislative bodies respond to the will of their constituents and act 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 been active in organizing and supporting the activities of individual interests in the Basin. Examples of activities by nonprofit/nongovernmental organizations that implement elements of the plan include water-quality monitoring, research, and conservation of cultural heritage resources found submerged in the Lake. Citizen groups, including watershed organizations, have been especially successful in implementing educational workshops, streambank stabilization, toxin reduction initiatives, aquatic species control, public forums, the restoration of contaminated sites, the

encouragement of low-impact recreational activities, and continued communication with the LCBP about emerging issues and priorities.

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 Smiths College, St. Michaels College, Institut de Recherche et de Développement en Agroenvironnement (IRDA), McGill University, Université de Sherbrooke, Cornell University, Middlebury College, Green Mountain College, Johnson State College, and others have conducted various research projects on the Lake and the Basin. They also have been highly effective in educating 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 plan implementation requires continued participation by academic institutions and research organizations and depends greatly on the soundness of data and information collected by them.

Several academic institutions have established a multidisciplinary research and education program called the Lake Champlain Research Consortium. Membership in the Consortium currently consists of academic institutions conducting research within the Basin boundaries. The Lake Champlain Research Consortium collaborates with the LCBP periodically to sponsor research symposia and conferences, and identifies 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, created a Policy Committee consisting of program directors from the three agencies and management and technical committees of agency staff. Organizations in Québec are not formal partners with the Cooperative but coordinate and communicate with it.

The Lake Champlain Ecosystem Team is an association of organizations involved in the conservation of plants, animals, and their habitats in the Lake Champlain watershed. The Lake Champlain Ecosystem Team maintains and enhances ecological integrity throughout the Basin. Their efforts include enhancing interdisciplinary cooperation and partnerships among federal, state, and private conservation organizations and academic institutions; facilitating and coordinating biological resource conservation activities; and exchanging information.

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 US 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 has convened a Study Board to guide LCBP research and planning endeavors that it is funding in the Missisquoi River Basin.

The International Great Lakes Fishery Commission (GLFC) was created by the 1954 Convention on Great Lakes Fisheries between the United States and Canada to coordinate fisheries research, facilitate multi-jurisdictional cooperation through strategic planning, and manage sea lamprey populations in the Great Lakes. The Great Lakes and Lake Champlain share many natural resource challenges. The GLFC, the LCBP, and the USFWS entered into a *Memorandum of Understanding on Native Species and Habitat Restoration and Water Quality Improvements* in 2010. Through this MOU, funding support for Lake Champlain via the Great Lakes Fishery Commission has increased greatly since 2010, averaging approximately $3 million between the 2014-2016 fiscal cycles, with approximately $1 million of these funds supporting LCBP programs.

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 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 and to allocate resources to appropriate entities based upon recommended priorities. Refer to Strategies for Funding Implementation for information about funding implementation efforts.

Each fiscal year, LCBP is typically appropriated funding from the US EPA, National Park Service, and the Great Lakes Fishery Commission. These funds form the basis of our annual budget cycle, through which essential budgetary items are developed, including annual staffing levels, essential programmatic funding (e.g. monitoring programs), and new "capital" budget projects, such as targeted research projects, management interventions, heritage and recreation grants, or outreach campaigns.

The Lake Champlain Steering Committee has recently directed the LCBP staff to supplement these appropriations from the EPA, NPS, and GLFC with funding received from national grant competitions. If successful, funding from these grants can be used to augment existing LCBP programs, or to fund new initiatives of national significance that also address management plan goals, but have not historically been a high priority in the Lake Champlain annual budget allocations. In addition to augmenting the budget for new initiatives, these grant programs might be used to support staff time to work on these specific projects, releasing staff time from EPA, GLFC, or NPS awards.

The LCBP also works with partners to identify and recommend projects suitable for funding through other programs. For example, the US Army Corps of Engineers administers Section 542 of the Water Resources Development Act. Section 542 authorizes the Secretary of the Army to establish a program for providing environmental assistance to non-Federal interests in the Lake Champlain Watershed. The LCBP, in coordination with the Corps, has developed Section 542 program goals and priorities, and project eligibility criteria. The LCBP works with US Army Corps to solicit project proposals. The LCBP Technical Advisory Committee (TAC) conducts technical evaluation of proposals, and the LCBP Steering Committee sends recommendations to the Corps. Details on the project identification and the evaluation and ranking process are provided in the General Management Plan for Section 542 of the Water Resources Development Act. Once projects are identified and prioritized for funding through the LCBP process, the US Army Corps of Engineers is then responsible for execution of these projects.

Conduct Sound Research

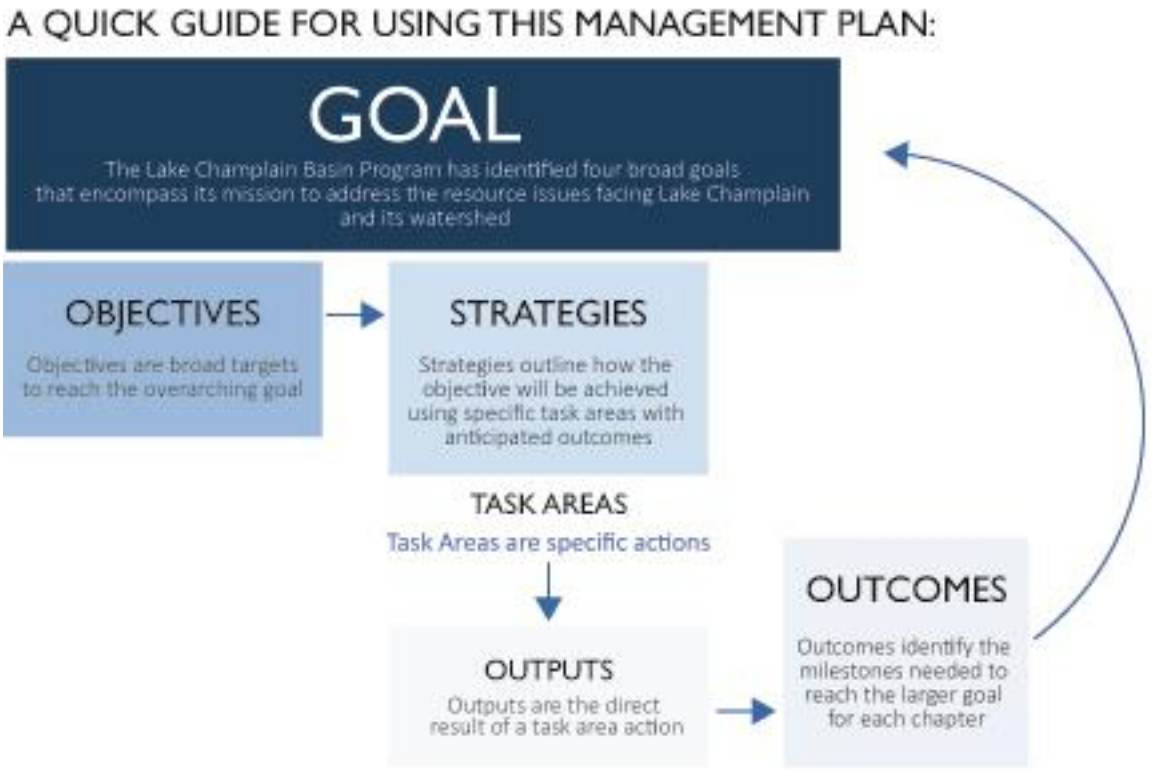
The plan identifies several areas in which research is needed. Research has been an important component of preparing and updating the plan and will continue to provide critical information as implementation evolves. Improved knowledge of the physical, chemical, biological, and social characteristics 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. Some management programs may become more important, other less so. The plan should 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 THE GOALS OF THIS MANAGEMENT PLAN

The Lake Champlain Basin Program has identified four main goals that address the resource issues facing Lake Champlain and its watershed. Each goal is broken into **objectives, strategies, task areas** and **anticipated outcomes**. Objectives are broad targets to reach the overarching goal of the chapter. Strategies outline how the objective will be achieved using specific task areas with anticipated outcomes. Each annual budget cycle will give the Lake Champlain Basin Program committees an opportunity to review the task areas for each goal to determine progress made and areas for further work.



GOAL I: CLEAN WATER

Lake Champlain waters will be clean enough for people to swim, boat, fish and drink with minimal treatment, and will be able to support a healthy ecosystem. Improving the water quality of Lake Champlain and its watershed is critical in achieving progress towards a healthier

environment. Strategies in this section focus on maintaining the current monitoring network, understanding the risk of toxic pollutants, and reducing nutrient inputs to water bodies.

GOAL II: HEALTHY ECOSYSTEMS
Lake Champlain's aquatic ecosystems will be healthy enough to support a rich diversity and abundance of native species, reduce the risk and impact of non-native species, and support nutrient filtration, flood resilience and sediment retention. A healthy Lake Champlain ecosystem is critical to maintaining a high functioning Lake, but it is vulnerable to existing and future impacts. Wetland and upland habitat, in particular riparian and shoreland habitat areas must be identified, prioritized, protected and restored in each sub-watershed. Native species must be conserved while the impact of aquatic invasive and non-native species is reduced through improved management strategies.

GOAL III: THRIVING COMMUNITIES
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. Lake Champlain is a destination for recreation and tourism, as well as a renowned place to live. Community involvement to improve Lake Champlain and its watershed is critical to achieving a swimmable, drinkable, fishable Lake. As part of the Champlain Valley National Heritage Partnership, strategies in this section focus on preserving the rich cultural heritage of the watershed and connecting people to their landscape.

GOAL IV: INFORMED AND INVOLVED THE PUBLIC
Basin residents and visitors will understand and appreciate the Lake Champlain Basin resources, and will possess a sense of personal responsibility that results in behavioral changes and actions to reduce pollution. A main tenet of the Lake Champlain Basin Program is providing valuable education to the public. This goal outlines ways to improve communication, scientific literacy, and cultural guidance to communities, partners, the media, K-12 educators and children.

MANAGEMENT THEMES IN EACH GOAL:

In each goal outlined in this management plan are themes that define the LCBP's approach to reaching the ecosystem targets. These themes reflect a whole-watershed management approach that address 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 km^2) 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 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 offers opportunities for 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. Implementation of the plan continues to use a watershed approach that links the Lake with activities in its watershed.

LCBP 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, however, than others – particularly with respect to nutrient management issues. Several of our State and Federal partners have targeted, within their own respective management planning efforts, several watersheds to focus resources for nutrient pollution reduction. These watersheds include Missisquoi Bay, St. Albans Bay, and the South Lake (Crown Point area southward). LCBP will work with State and Federal partners to prioritize some LCBP funds toward nutrient reduction within these high priority watersheds each fiscal 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 within these watersheds to target funding for interventions.

Resilience to Climate Change

The climate is changing and we must be prepared for a future environment that may look very different than the one we see today. Throughout each goal, the principles addressing local and regional-level climate change are embedded in the strategies for implementing action. Scientists predict a warmer, wetter Lake Champlain, which has wide-reaching impacts to tourism, water quality, invasive species spread and many other management priorities. Ongoing research at the University of Vermont has shown that climate change is occurring at a faster rate in the region than originally predicted, and local and state governments are starting to take action. Management at the watershed scale must prepare ahead for these changes ahead to remain resilient to future risks.

Science-Driven Collaborative Management

OFA is the result of numerous cooperating agencies, organizations, and individuals combining their efforts to protect and enhance the resources of the Lake Champlain Basin while solving identified problems. Management of Lake Champlain resources is based on consistent, high-quality data and the best scientific knowledge, and is coordinated with the vast array of federal, state provincial, local, and not-for-profits partners. Implementing the plan continues to involve a broad range of participants in a consensus-based approach to decision making. Encouraging numerous stakeholders to provide input strengthens the outcomes of the decision-making process and broadens the base of citizens and organizations responsible for and active in plan implementation.

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 recommends actions to protect and restore the ecological and cultural resources of the Basin while ensuring economic benefits for long-term positive change in the

Lake. Finding the most cost-effective actions to protect and enhance the quality of the Lake while maintaining the economic viability of the region is extremely important.

Measurable Progress

LCBP carefully tracks the outcomes of funded projects to measure achieved progress. Since the last iteration of this management plan, from January 2011 through December 2016, the Lake Champlain Basin Program funded nearly $13 million in projects. These projects improved water quality, expanded research and monitoring programs and provided education throughout the watershed. During that time, LCBP funded nearly 330 projects ranging from curriculum development and cultural heritage recognition to aquatic invasive species spread prevention and nutrient reduction programs.

Achievements include the completion of 245 technical projects totaling $12.5 million. With that funding, LCBP continued its flagship technical projects: the long-term water quality and cyanobacteria monitoring programs, water chestnut harvesting and the boat launch steward program. LCBP has actively funded research to better understand Lake Champlain's complex ecosystem, filled information gaps and identified innovative ways to address nutrient pollution. Much of the work has been on the ground, with thousands of shoreline acres restored, tens of thousands of boats inspected for aquatic invasive species, and hundreds of improved stormwater and agricultural practices implemented. Working with partners, LCBP facilitates analysis of these technical projects and provides outreach to inform citizens throughout the watershed.

Since 2011, LCBP has completed over 80 educational projects totaling nearly $500,000. These funds supported the critical work of local watershed groups, delivered targeted technical training to stakeholders, provided community action, and continued LCBP's acclaimed teacher-training workshops. Each year, LCBP staff deliver interactive watershed-based demonstrations to hundreds of students and provide science-driven outreach to 160,000+ visitors in the Resource Room located within the ECHO Leahy Center for Lake Champlain. In 2013, the LCBP communications team redesigned the suite of LCBP websites to achieve 30,000 annual web visits, while a revamped quarterly newsletter and weekly social media posts kept the public informed of basin news. LCBP's flagship outreach tool, the *State of the Lake* report, was published twice since 2011 with 12,000 copies printed for each iteration.

The Champlain Valley National Heritage Partnership (CVNHP) has awarded more than $1 million in grants since its inception in 2006. Under the current management plan, CVNHP staff have focused on preserving, protecting and interpreting the historical, cultural and recreational resources of the Champlain Valley. Since 2011, the CVNHP has expanded its wayside exhibit program and built strong partnerships throughout New York, Québec and Vermont.

EXPLANATION OF PROGRESS TRACKING METRICS:

Phosphorus load reductions are the statutory requirements of the state, federal and provincial governments. The LCBP was established by the EPA with the charge of coordinating pollution

prevention and restoration efforts among government agencies working toward these outcomes, within the constraints of the annual budget allocated to LCBP by the U.S. Congress.

The Lake Champlain Steering Committee has identified the priorities for each goal for LCBP support, or support from our partners, to address over the life of this management plan. For each of these priorities, there are anticipated outputs that will be tracked by LCBP and reported annually via our Annual Report of Activities, to provide a summary of all relevant outputs by topic area. These outputs also will be communicated to the relevant jurisdictional partners for their tracking purposes.

Ultimately, the LCBP Measures of Success are 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.

GOAL I: CLEAN WATER

Lake Champlain waters will be clean enough for people to swim, boat, fish and drink, and will be able to support a healthy ecosystem. Clean water also is critical for the diverse ecosystems, working landscapes, and vibrant communities that sustain us. Pollution from human activities across the watershed inhibits the water quality of the lake, reduces recreational access, and decreases economic opportunities. Lake Champlain is among the 20% of lakes in the United States that are impaired by excess nutrients, and among the nearly 50% of lakes with health advisories for fish consumption due to elevated mercury concentrations.

SCIENTIFIC UNDERSTANDING

Sound science provides a road map for action to achieve clean water in the Lake Champlain Basin. Our understanding of clean water stems from ongoing monitoring and targeted research. Monitoring networks, such as the Lake Champlain Long-Term Monitoring Program within the basin are critical for identifying which areas are in need of pollution interventions. Data from these networks provide a foundation for management decisions to allocate limited resources around the basin for research and installation of management practices. In addition, new technologies and cutting edge research is necessary to address threats to clean water.

NUTRIENT LOADING

While nutrients are essential for any ecosystem, excessive levels of nutrients can be severely detrimental to water quality. Nutrients are a concern in the Lake Champlain Basin due to excessive loading from human activities. Nutrients are delivered to the lake from the tributary network, the lakeshore, and the atmosphere. Desired outcomes for the Clean Water section of OFA will reflect phosphorus loading reductions to be identified in the most recent Total Maximum Daily Load (TMDL) and associated implementation plans for Vermont and New York, and reduction plans identified for the Québec-portion of the Missisquoi Bay watershed.

The Lake Champlain Steering Committee has established a series of desired outcomes that are expected to be met by the end of this five-year management plan for priority watersheds. These outcomes reflect anticipated reductions in loading of phosphorus to the lake, based on protection, restoration and management actions in the watershed that will have been implemented by federal, provincial, and local management agencies and organizations collectively working with the Lake Champlain Basin Program.

CONTAMINANTS

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

The Lake Champlain Steering Committee has identified a suite of priorities to reach the goal of clean water in Lake Champlain. LCBP will serve a role to meet each of these priorities:

- State, Federal, and Provincial agencies have established goals to reduce total phosphorus loading from tributaries draining into Missisquoi Bay, St. Albans Bay, and the South Lake.
    - The LCBP role in assisting our partners toward achieving established phosphorus load reduction goals for these lake segments achieving this outcome will be to maintain the monitoring network to document these improvements and to address task areas targeted at reducing nutrient loads, which are identified in this Plan as high priorities for LCBP support between 2017-2022.
- Reduce and strive to eliminate beach closings associated with HABS and elevated bacteria counts lake-wide.
    - The LCBP role in achieving this outcome will be to continue to support interventions across the Lake Champlain watershed that reduce pollutant loads contributing to HABs and bacteria counts exceeding federal, state, and provincial thresholds, through the support of implementation projects. The areas of Plattsburgh, NY and St. Albans Bay, VT will be considered a high priority.
- Reduce the portion of Lake Champlain experiencing harmful algal bloom conditions at High Alert.
    - The LCBP role in achieving this outcome will be to continue to support interventions across the Lake Champlain watershed that reduce pollutant loads contributing to HABs, and continuing to monitor and track the extent of HABs and their alert level.
- Identify the level of toxic contaminants (e.g. mercury, PCBs, dioxins, furans, and organic contaminants) in sport fish tissue.
    - The LCBP role in achieving this outcome will be to continue support of regular assessments for mercury and PCBs in Lake Champlain sportfish, and to support

development of new assessments of additional contaminants of concern in Lake Champlain sportfish to inform development of fish consumption advisories, where appropriate.

Measures of Success:

Each strategy in the tables below provides one or more "task areas" that may be prioritized for LCBP support, or support from our partners, to address over the life of this management plan. For each of these task areas, there are anticipated outputs associated with projects that might be supported in that task area. These outputs will be tracked by LCBP and reported annually via our Annual Report of Activities, which will provide a summary of all relevant outputs by topic area. These outputs also will be communicated to the relevant jurisdictional partners for their tracking purposes.

Ultimately, the LCBP Measures of Success are 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.

Objective 1.A. Improve scientific knowledge and understanding of water quality conditions and trends in Lake Champlain and the effectiveness of management approaches

Accurate information is vital to the success of any management plan. Strong, well-organized monitoring programs provide a long-term record of data that inform management decisions by documenting successes in interventions and identifying areas in need of further management effort. Under this strategy, LCBP will work with Lake Champlain management partners to broaden support of more innovative research to explore new solutions for pollution prevention and reduction. Task areas within this strategy will work to accomplish the following:

a. Increase accessibility of data on Lake Champlain
b. Support innovative management approaches likely to achieve results
c. Increase understanding of factors affecting BMP performance and efficiency

NOTE: Task areas identified with ** denote task areas that should be targeted with LCBP funds. Other task areas may be more appropriate for other watershed management agencies or partners to support.

Strategy	Task Area	Anticipated Output	Outcome
Strategy 1.A.1: Fund and interpret management-oriented research	** 1.A.1.a: Increase accessibility of data on Lake Champlain There is a wealth of data available for new research programs on Lake Champlain. Projects addressing this task area will connect the research community with datasets or data managers in the basin to inform new research projects and foster new opportunities for collaboration within the basin and beyond.	At least one new funded research project that uses an existing Lake Champlain dataset, such as the Lake Champlain Long-Term Monitoring database. Support a Lake Champlain Research Conference to promote collaboration and data sharing opportunities.	Maximize use of data to address watershed issues through research. Long-term monitoring data for Lake Champlain will form the basis for new research in the watershed to guide policy decisions.
	1.A.1.b: Support innovative management approaches likely to achieve results. LCBP will release a Request for Proposals to solicit new management-oriented research projects that address clean water priorities, including nutrient issues, toxic substance issues, and monitoring programs that will directly inform management or policy	One new funded research project that directly informs management or policy decisions related to toxic substances, nutrient loading and cycling, or monitoring programs.	Identify new management approaches that are effective at reducing nutrients and toxic substances.

	decisions. LCBP may initiate a subcommittee in the form of an "Innovation Hub" to facilitate generation and evaluation of innovative ideas.		
	** 1.A.1.c: Increase understanding of factors affecting BMP performance and efficiency. This task area will support programs that explore emerging approaches to reduce nutrient, sediment, or toxin loading to the Lake through the use of new, innovative tools or by improving efficacy of existing tools, and by incorporating potential effects of climate change into these approaches.	One new research program, leveraging funds from other programs where possible, that examines new tools or techniques to reduce pollutant loads to Lake Champlain.	New or improved intervention options for installation in the watershed to reduce pollutant loads.
Strategy 1.A.2: Fund and Interpret Monitoring Programs	**1.A.2.a: Maintain the Lake Champlain Long-Term Monitoring program. This task area will continue support of monitoring of certain chemical, physical, and biological parameters to detect changes in the Lake Champlain ecosystem.	Intact period of record and regular interpretation of Lake Champlain long-term monitoring data.	Enhanced environmental knowledge will be achieved as long-term monitoring data will continue to be available through 2022 via web access.
	**1.A.2.b: Expand Sub-Watershed Monitoring to inform targeted watershed objectives.	Develop intensive short-term period of record for	One subwatershed (HUC Level 12) will have a short-term monitoring study

	This task area will focus subwatershed monitoring on 3-5 year rotations in collaboration with State and Provincial agencies to identify problem areas and document improvements from interventions at the sub-watershed level.	selected subwatersheds, targeted approach toward installation of BMPs.	completed, with targeted sites for BMP interventions.
	** 1.A.2.c: Assess progress of existing water quality management programs. This task area will support a project to review the effects of recent management decisions to inform new decisions, priorities, and management trajectories.	New management priorities informed by outcome of previous projects (decision feedback loop).	Management plan progress analysis, with recommendations for course-corrections where applicable.

Partner Watershed Management Plans related to this strategy:

- Lake Champlain Long Term Monitoring Program
- Phosphorus TMDLs for Vermont Segments of Lake Champlain, June 17, 2016.
- 2002 Lake Champlain Phosphorus TMDL
-

Objective 1.B. Reduce Contaminants of Concern and Pathogens

Toxic substances and pathogens can severely degrade the integrity of the ecosystem, inhibit recreational opportunities, affect the quality of Lake Champlain as a drinking water supply, and potentially cause acute or chronic illness. Task areas within this Objective will work toward improving our understanding of which contaminants are of greatest concern in Lake Champlain, where they come from, and how to reduce their impacts on the water quality of Lake Champlain.

Strategy	Task Area	Anticipated Output	Outcome
Strategy 1.B.1: Control Sources of Contaminants Under this strategy, LCBP will work with Lake Champlain management partners to identify sources of pathogens and toxic substances and work to identify mechanisms or interventions to mitigate these sources. Task areas within this strategy will work to accomplish the following: a. Understand Emerging Contaminants and Points of Control b. Support screening for raw lake water periodically for toxic substances, including	** 1.B.1.a: Understand Emerging Contaminants and Points of Control. Historical toxicology studies in the Champlain basin have focused on mercury, PCBs, and other similar pollutants.	Comprehensive review of emerging contaminants of concern in the Champlain basin, including potential sources and effects, and mitigation options. Pollution source mitigation plans for high priority contaminants into Lake Champlain, including targeting of funding sources to execute the mitigation plans.	Summary of toxicological concerns for "new-age" or emerging contaminants in the Champlain basin.
	1.B.1.b: Support screening for raw lake water periodically for toxic substances, including herbicides, pesticides and personal	Database of monitoring information for suite of personal care products	Toxin management policy informed by new data generated to document pollutants measured in the lake,

herbicides, pesticides and personal care products c. Fund projects to reduce public beach closures d. Fund monitoring programs to inform consumption advisories for Lake Champlain fishes	**care products**. There are many new pollutants entering Lake Champlain for which regular assessments or monitoring programs are not in place, especially at raw water intakes for drinking water treatment facilities. Impacts of many of these new toxins on the lake ecosystem also are unknown.	developed and populated.	particularly at raw-water intakes.
	1.B.1.c: Fund projects to reduce public beach closures. LCBP will support new research or implementation projects that inform reductions in beach closures due to HABs or high bacteria levels. This information will assist in targeting interventions for specific beaches around the Lake, factoring in potential effects of increased rainfall intensities, as predicted by recent climate change modeling exercises.	New BMPs or infrastructure upgrades that can be installed to reduce beach closures or increasing stormwater retention capacity to reduce runoff during storm events.	Reduction in beach closure frequencies.
	1.B.1.d: Fund monitoring programs to inform consumption advisories for Lake Champlain fishes. LCBP will continue to	Updated mercury concentration in fish tissue by 2022. Support development of	New data will be required to update fish consumption advisories for mercury concentrations in

	support regular assessments of toxins in sportfish to provide data to keep consumption advisories current, and support assessments of new contaminants to inform advisories.	cyanotoxin in sportfish dataset to inform new consumption advisory for this group of toxins.	sportfish (current data will have been collected in 2016). New consumption advisories for fish collected near a harmful algal bloom, if applicable, will be in place by 2022.

Partner Watershed Management Plans related to this strategy:

- LCBP Toxic Substance Management Strategy: http://www.lcbp.org/wp-content/uploads/2012/11/69_Toxics_Strategy_September2012.pdf

(MORE FORTHCOMING)

Objective 1.C. Reduce Nutrient Loading

Excessive nutrient loading continues to be an issue in Lake Champlain, as with many lakes globally. Nutrient loads come from all land use sectors, although some sectors contribute more per acre in certain watersheds than others. The strategies and task areas under this objective will work toward reducing nutrient loading from streambanks, agricultural lands, developed lands, and forested lands.

Strategy	Task Area	Anticipated Output	Outcome
Strategy 1.C.1: Fund Research and Watershed Interventions to Reduce Streambank Nutrient Inputs Under this strategy, LCBP will work with partners to fund research and watershed interventions to reduce nutrient inputs from streambanks. Task areas within this strategy will work to accomplish the following: a. Fund Projects to Improve Bank Stability in Critical Areas of the watershed b. Fund programs to protect or enhance river corridors for	**1.C.1.a: Fund projects to improve bank stability in critical areas of the watershed**. This task area will support programs to improve our understanding of streambank vulnerability and quality of riparian corridors and connect rivers to their floodplains in critical watersheds	Identify and rank vulnerable stream banks in critical watersheds for restoration and implement BMPs on 5 critical areas	Prioritized list of streambanks for targeting resources for interventions.
	** **1.C.1.b: Fund programs to protect or enhance river corridors for nutrient reduction and flood resilience**. Support programs to improve quality of riparian corridors and connect rivers to their floodplains in critical watersheds, factoring in data from TMDLs and the predicted effects of climate	Manage an additional 100 acres for riparian habitat quality; restore 3,000 linear feet of riparian corridor habitat, conduct outreach to at least 100 landowners for conservation of riparian habitat.	Increased areas of high-priority riparian areas conserved throughout the basin.

nutrient reduction and flood resilience	change on timing, frequency, and intensity of precipitation events.		
Strategy 1.C.2: Fund Programs to Reduce Nutrient Inputs from Agriculture Agriculture is a major source of nutrient pollution in several watersheds in the Champlain basin. Task areas in this strategy will work to refine mechanisms to reduce pollutant loads from agricultural sources through the following: a. Provide Technical Assistance for Land Treatment Plans (LTPs) and Nutrient Management Plans (NMPs) b. Research and Promote Programs to Optimize Fertilizer Applications to Reduce Nutrient Load c. Reduce acreage of flood-prone land areas in agriculture d. Help farmers meet Clean Water	** 1.C.2.a: Provide Technical Assistance for Land Treatment Plans (LTPs) and Nutrient Management Plans (NMPs). Farmers need to have approved LTPs and NMPs in place to qualify for certain program funding. Projects in this task area will provide support for farmers to develop and maintain LTPs and NMPs that meet the appropriate standards for other funding opportunities.	90% of farms interested in USDA programs have LTPs and NMPs complete at time of application.	Increased number of farms participating in USDA program funding.
	** 1.C.2.b: Research and Promote Programs to Optimize Fertilizer Applications to Reduce Nutrient Load. LCBP will support development of programs to work with farms to calibrate fertilizer applications.	90% of large and medium farms and 25% of small farms in critical watersheds receive fertilizer calibration training; 25% participation of all farms in non-critical watersheds.	Reduction in fertilizer applied by large and medium farms within critical watersheds through increased accuracy of application.
	1.C.2.c: Reduce acreage of flood-prone land areas in agriculture. Work with partner agencies and NGOs to identify farm fields in flood-prone areas and	30% reduction of annual crops in flood-prone areas in critical watersheds	Reduction in soil and crop loss on agricultural fields due to flooding

regulations with targeted cost-share support for small farms e. Research and Support Phosphorus Removal Opportunities from Tile Drains and Agricultural Ditches f. Research and support sustainable agricultural practices that address water quality concerns and also are economically sustainable	move them out of production or into perennial crops for soil retention and to increase resilience to climate change-related factors.		
	1.C.2.d: Help farmers meet Clean Water regulations with targeted cost-share support for small farms. Farmers often need cost-share support for BMP programs, particularly when milk prices are low. LCBP will provide cost-share support for projects in critical sub-watersheds.	100% cost share support for BMP applications addressing Critical Source Areas on farms in priority subwatersheds. Also provide cost-share support where possible in remaining watersheds.	Continued participation in BMP programs during periods of low milk prices.
	1.C.2.e: Research and Support Phosphorus Removal Opportunities from Tile Drains and Agricultural Ditches. LCBP will continue to work with federal and state partners to support new innovative research programs to identify technologies and practices to improve phosphorus removal systems from tile drains.	Fund 1 new research program to explore P removal systems in tile drains and ditches.	Informed policy on tile drainage systems to reduce impacts of tile drainage on nutrient loading to the Lake or tributary network
	1.C.2.f: **Research and support sustainable agricultural practices that address water**	Support a research program to explore	Examples of nutrient reduction BMPs with economic benefits to farmers identified.

	quality concerns and also are economically sustainable LCBP and partners will explore water quality systems that address agricultural practices from pollution abatement and farm viability perspectives	pollution interventions on farms that address water quality concerns and improve farm economic viability	
Strategy 1.C.3: Fund Programs to Reduce Nutrient Inputs from Developed Lands Stormwater continues to be a major pollution issue in urban settings within the Lake Champlain watershed, as stormwater runoff and through wastewater treatment systems. Task areas in this strategy will work to address pollutant loads from developed lands through the following: a. Support training programs to WWTFs for Asset Management b. Fund Research and Implementation Programs to Reduce Impervious Surface Area	**1.C.3.a: Support training programs to WWTFs for Asset Management**. Municipalities are facing unprecedented needs associated with reducing nutrient load, as well as managing aging and deteriorating sewer infrastructure systems. Deteriorating systems pose real threats to human health and the environment. Aging systems also drive up the operation and maintenance costs, compromise service, and force municipalities to continually seek ways to defer maintenance or avoid upgrades. LCBP will work with partners to support asset management training to provide operational, maintenance, and financial guidance to municipalities and	Asset management plans in place for all high-risk WWTFs in the basin, with funding options identified.	High-risk wastewater treatment facilities will have asset management plans in place to facilitate management, reduce phosphorus loading and human/mechanical errors, and funding streams to support necessary upgrades on schedule.

c. Fund design and implementation of GSI projects in critical areas	wastewater treatment governing boards and plant operators in the management of public infrastructure investments.		
	1.C.3.b: Fund Research and Implementation Programs to Reduce Effective Impervious Surface Area. Management agencies in the watershed will continue to support research and watershed interventions to address nutrient runoff from impervious surface areas in critical watersheds, incorporating predicted effects of climate change on precipitation events.	GSI	Increased understanding of efficacy of interventions that reduce stormflows and associated nutrient loading from urban areas and increase resiliency to flood damage.
	1.C.3.c: Fund design and implementation of GSI/LID projects in critical areas. There continues to be a need for grant funding for design of shovel-ready projects and installation of GSI/LID projects across the watershed. LCBP will continue to support a grant program targeting green stormwater infrastructure (GSI) in critical watersheds.	Twenty new GSI projects installed or designed (shovel-ready) in critical watersheds and Twenty new projects in remaining watersheds across the Basin.	Reduced stormflows from urban areas in critical watersheds.

Strategy 1.C.4: Fund Programs to Reduce Nutrient Inputs from Forested Lands Forested lands are the largest land use sector within the Lake Champlain Basin. Task areas within this strategy will work to address pollution loads from the forest sector, including conservation of critical riparian corridors, research and support for BMPs in the forestry sector, and outreach programming. Task areas in this strategy will work to address pollutant loads from forested lands through the following: a. Fund programs to Promote Forestry Practices with Water Quality Benefits b. Support Projects to Restore and Protect Riparian Forests & Corridors c. Educate and Assist Landowners to Promote Clean Water Regulations on Forested Lands	**1.C.4.a: Fund programs to Promote Forestry Practices with Water Quality Benefits**. Support innovative and tested forestry BMPs to reduce nutrient runoff, while also protecting sensitive habitat, reducing species impacts, and improving climate change resilience.	Five new innovative and tested forestry BMPs to reduce nutrient runoff, and protect sensitive habitat and species impacts.	Enhanced suite of forestry BMPs with known pollutant reduction efficiencies and benefits to riparian habitat and associated species.
	1.C.4.b: Support Projects to Restore and Protect Riparian Forests & Corridors. Support forestry projects that reduce nutrient loading and increase stream bank stability along riparian corridors, with priority to projects that also can manage riparian invasive species spread or protect wildlife habitat.	Five conservation easements or BMPs on riparian forest corridors that reduce nutrient loading proximal to waterways.	Improved riparian corridor stability in the areas targeted by easement or management projects.
	1.C.4.c: Educate and Assist Landowners to **Promote Clean Water Regulations on Forested Lands**. Support water quality BMP training programs associated with forested lands.	Five training workshops for water quality in forested lands targeting forest managers or landowners.	Increased implementation of best management practices and reduced pollutant load from forested lands.

Partner Watershed Management Plans related to this strategy:

- 2016 Vermont Lake Champlain TMDL (EPA webpage)
- 2002 New York Lake Champlain TMDL
- 2016 VT Required Agricultural Practices
- 2016 Vermont Lake Champlain Phosphorus TMDL Phase I Implementation Plan
- Vermont Tactical Basin Plans

(MORE FORTHCOMING)

Goal II. Healthy Ecosystems

Healthy ecosystems provide invaluable services such as native species habitat, nutrient filtration, flood resilience, and sediment retention. These ecosystems in the Lake Champlain Basin support a lake that provides clean water for drinking and recreating, and healthy fish and wildlife populations. With this goal, we strive to strengthen the aquatic ecosystem by improving connectivity, supporting restoration efforts for species of concern, and reducing the risk of new invasions by non-native species.

The Lake Champlain Basin is a large freshwater ecosystem with a rich diversity and abundance of native fish, wildlife, and plants. These native species occupy a mosaic of interconnected aquatic and terrestrial habitats, including broad open waters, tributaries, wetlands, forests, agricultural lands, and other areas. Microscopic plankton, fish, birds, other wildlife, and plants are all intrinsically linked through the Lake Champlain food web. The structure, function, and balance of the food web is closely connected to water quality, habitat diversity, land use and human health. The abundance of fish, wildlife, and plant communities within the basin attract a wide array of recreational users, including hunters, anglers, trappers, paddlers, hikers, and bird watchers, providing a significant economic benefit to the regional economy. Natural species diversity is a highly valued part of the region's natural heritage and a critical component of the ecosystem that we all share.

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.

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.

AQUATIC INVASIVE SPECIES

Aquatic invasive species (AIS) are non-native plants, animals, and pathogens that harm the environment, economy, and/or human health. AIS that become established in the basin can pose serious threats to indigenous fish, wildlife and native plant populations, impede recreational activities, significantly alter the ecosystem of the Lake, and damage the economy of the region. Of the 50 known non-native aquatic species in Lake Champlain, about a dozen are classified as harmful AIS. Water chestnut is a particular concern because it impedes boat traffic and reduces recreational opportunities. Management of this AIS offers an opportunity for success, since several stands have been limited in range by management efforts.

AIS enter the Lake Champlain Basin through several pathways, most commonly through interconnected waterways, such as the Champlain and Chambly Canals and Richelieu River, or overland through human activities, such as boating and bait transport. Other pathways include accidental water garden releases, aquarium dumping, and illegal fish stocking. The interconnected waterways of Lake Champlain transcend the authority of any single state or jurisdiction, necessitating coordination among the different partners to address early detection, rapid response to new infestations, management of invasive species populations, and coordination of spread prevention programs. Once introduced into Lake Champlain, AIS have the potential to spread to other inland water bodies in the basin.

Work in the basin to prevent the spread of AIS is enhanced by regional and national collaboration which connects the basin to the latest invasive species research, control technologies, education and outreach approaches, pathway management, and innovative partnerships. The Long-Term Monitoring on Lake Champlain is an essential component of aquatic invasive species early detection. For example, the first detection of spiny water flea came from a routine net tow at an established Main Lake site.

BIODIVERSITY

Maintaining a high level of biodiversity is critical for a healthy ecosystem in the face of increasing threats from habitat loss and degradation, AIS, and climate change. Rare, threatened, and endangered species, such as the pink heel splitter (a native mussel), common tern, lake sturgeon, and spiny softshell turtle, are of particular management concern and are protected under state and federal legislation. To ensure sustainable native fish populations, state and federal agencies assess and stock native and sport fish species in Lake Champlain. In addition, the Champlain Fish and Wildlife Management Cooperative regularly monitors populations of landlocked Atlantic salmon, lake trout, brown trout, American eel, lake sturgeon, walleye, and northern pike, and conducts targeted research on limiting factors to guide future management.

The Lake Champlain Steering Committee has identified a suite of priorities to reach the goal of healthy ecosystems in Lake Champlain. LCBP will serve a role to meet each of these priorities:

- Identify threats to species of concern from climate change
    - The LCBP role in achieving this goal will be to maintain and expand the existing Lake Champlain monitoring sites to inform assessments of threats to critical

habitat for indigenous species, impacts of invasive species, and management strategies to help increase species resilience.

- Develop comprehensive strategies for habitat protection and restoration in priority sub-watersheds of the basin
    - The LCBP role in achieving this goal will be to support research and monitoring efforts to inform these subwatershed-level comprehensive strategies where necessary to support projects to address objectives developed within these strategies, and to facilitate and coordinate among the partners working on these strategies.
- Increase AIS spread prevention awareness and prevent new invasions
    - The LCBP role in achieving this goal will be to increase boat launch steward coverage and decontamination stations at public by 30% at state and provincial launches through the boat launch steward program and increase access to watercraft decontamination units at high traffic priority sites.
- Reduce the spatial presence of water chestnut in Lake Champlain
    - The LCBP role in achieving this goal will be to maintain support of the water chestnut program through hand-harvesting or mechanical harvesting, as needed, through 2022.

Measures of Success:

Each strategy in the tables below provides one or more "task areas" that may be prioritized for LCBP support, or support from our partners, to address over the life of this management plan. For each of these task areas, there are anticipated outputs associated with projects that might be supported in that task area. These outputs will be tracked by LCBP and reported annually via our Annual Report of Activities, which will provide a summary of all relevant outputs by topic area. These outputs also will be communicated to the relevant jurisdictional partners for their tracking purposes.

Ultimately, the LCBP Measures of Success are 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.

Objective II.A. Support Conservation of Vulnerable Habitat

Conservation of intact and well-connected natural areas and vulnerable habitats is important to protecting native plant and animal species and retaining ecosystem functions. Many variables threaten habitats in the basin including development and climate change. Strategies to identify and conserve refugia and protect migration corridors will support conservation of vulnerable habitats in the basin.

Strategy	Task Area	Anticipated Output	Outcome
Strategy II.A.1: Protect Important Riparian, Shoreland and Wetland Habitat Areas Under this strategy, LCBP will work with Lake Champlain management partners to conserve vulnerable lands by protecting important habitat areas including river corridors, shorelands, wetlands and other critical habitat areas. Task areas within this strategy will work to accomplish the following: a. Support programs to expand protection of river corridors b.Support programs to increase protection of lake shorelands	**II.A.1.a: Support programs to expand protection of river corridors.** River corridors are susceptible to impacts from land use and climate change including intense run-off events from more frequent and intense storms. Riparian corridors also are critical for maintaining connectivity in the face of climate change.	100 acres of river corridors conserved; cost per acre conserved documented	Aquatic organism passage projects, native plant and tree plantings along shorelines will stabilize stream corridors, increase shading and recruitment of woody material in the stream channel to improve fish habitat
	II.A.1.b: Support programs to increase protection of lake shorelands. The loss of shoreline habitat through development and armoring is extensive along the lake. Shoreline habitat protection, erosion control, adaptation to climate change and recreation is served by	2,000 feet of critical lake shoreland protected, enhanced, or conserved, including 500 feet of shoreland in Missisquoi Bay	Shoreline best management practices will be installed (native tree plantings) to decrease erosion to protect habitat and property and assist with land protection.

c.Support research to identify vulnerable lands for conservation d. Support programs to assist with conservation of critical habitat areas	better protecting this habitat area.		
	II.A.1.c: Support research to identify vulnerable lands for conservation. Support research to identify critical corridors for protection that may be susceptible to high nutrient runoff and/or support critical to rare, threatened or endangered species.	Areas of high conservation need will be identified and a minimum of five projects supported to identify areas of conservation need or to assist with protection of these areas	Critical habitat preservation, species protection, nutrient loading reduction and wildlife corridors improved.
	II.A.1.d: Support programs to assist with conservation of critical habitat areas. Protection of high quality watersheds is important to ensure their ecosystem service functions are maintained. Protecting habitat areas of high value is equally important to addressing impaired habitat areas. Such programs will also protect habitat for rare, threatened, and endangered species of high conservation need.	Critical habitat areas identified in priority watersheds and assistance with conservation of 50 acres of critical wildlife habitat.	One large-scale research project may identify critical habitats in need of conservation in priority watersheds in the basin or local grants will be granted to municipalities, NGOs, and planning organizations to implement conservation plans.

Related Partner Watershed Management Plans:

USACE programs have the potential to support environmental conservation and wetlands evaluation/restoration projects in the Lake Champlain basin through Planning Assistance to States program. The Continuing Authorities Program (CAP) Section 206 Aquatic ecosystem

restoration and Section 1135 Project modifications for improvement of the environment also may support habitat conservation. In addition, USACE has the capability to provide services in environmental characterization and restoration including wetland delineation/restoration, rapid assessment, and streambank restoration/stabilization, economic analysis of risk and uncertainty, and GIS support.

U.S. Fish and Wildlife Service, Lake Champlain Fish and Wildlife Conservation Office, Habitat Restoration, Partners for Fish and Wildlife Program

USFWS works with private landowners and other partners to restore and manage natural river, wetland, forest and upland communities to benefit for migratory birds, and fish, pollinators, and federally listed species in the Lake Champlain Basin. USFWS partners with Vermont Fish and Wildlife Department, the Vermont Agency of Agriculture Food and Markets and the U.S. Department of Agriculture through the Natural Resource Conservation Service, Farm Service Agency (FSA) and others. Specific approaches include restoring aquatic connectivity and road-stream crossings and dams, restoring riparian areas and buffers, instream restoration, restoring degraded wetlands, and young forest management. All of these projects are prioritized with partners using the best available information and monitoring to assess the success of the restoration work. https://www.fws.gov/lcfwro/

Vermont Fish and Wildlife Department - Vermont Conservation Design

The lands and waters identified in this project are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend. When conserved or managed appropriately to retain or enhance ecological function, these lands will sustain Vermont's natural legacy into the future. http://www.vtfishandwildlife.com/get_involved/partner_in_conservation/vermont_conservation_design

U.S. Fish and Wildlife Service/North Atlantic LCC - Regional Conservation Opportunity Areas

The Regional Conservation Opportunity Areas (RCOAs) project facilitated by the U.S. Fish and Wildlife Service North Atlantic Landscape Conservation Cooperative (LCC) brings together experts from Northeast 13 states, conservation organizations, and universities to identify places where the actions of individual agencies to support imperiled species and Species of Greatest Conservation Need, restore priority ecosystems, protect core landscapes, and promote connectivity between them, will have the greatest benefit for fish and wildlife across the region. The result of this collaborative effort is a suite of decision-support tools and regionally consistent datasets that offer voluntary guidance for partners working at different scales in the Northeast region to identify the best opportunities to protect land and restore habitat, and to justify those actions to stakeholders and funders. http://northatlanticlcc.org/
http://rcoa.cicapps.org/

Objective II.B. Preserve and Enhance Biodiversity

Preserving the basin's biodiversity is critical to supporting high functioning and healthy ecosystems. Habitat loss and aquatic invasive species are the most significant threats to biodiversity. Research and evaluation of management programs will foster a better understanding of how species interact in the lake's food web and in the surrounding watershed. Work to protect rare, threatened, and endangered species, and the selection of best management practices will help restore native species and those of high conservation need.

Strategy	Task Area	Anticipated Output	Outcome
Strategy II.B.1: Develop and Support Programs that Improve Diversity of Aquatic and Riparian Species in the Basin Under this strategy, LCBP will work with Lake Champlain management partners to improve our understanding of the functions and threats to the Lake Champlain ecosystem, and work toward protection and restoration of native species. Task areas within this strategy will work to accomplish the following: a. Support research to better understand	**II.B.1.a: Support research to better understand food web dynamics.** Fund research to improve understanding of lower to upper food web interactions and impacts of changing external and internal drivers, such as temperature or precipitation fluctuations, new species, or changes in abundance of existing species.	Up to three high priority aquatic organisms studied with resource management implications and specific impacts to species of interest identified (qualified or quantified)	Improved basin-wide data for selected threatened and endangered species will provide better informed management decisions.
	II.B.1.b: Assess threatened and endangered species information gaps. Support state and provincial efforts to describe information gaps for threatened and endangered or	Support a species-specific research project and multiple habitat restoration projects.	Enhanced protection of threatened and endangered species through generation of critical information to inform management decisions for these species.

food dynamics b. Assess threatened and endangered species information gaps c. Protect and restore native species d. Support research to assess success of current ecosystem management programs	Species of Greatest Conservation Need (SGCN) species to inform management restoration efforts.		
	II.B.1.c: Protect and restore native species. Native species are protected when their critical habitat areas are preserved and connected. Many man-made structures such as roads, culverts, and other human landscape features and land uses fragment critical habitat for native species.	Projects that improve native species restoration, aquatic organism passage, wetland restoration, or other habitat restoration interventions.	Protect and restore habitat areas that support native species.
	****II.B.1.d: Support research to assess success of current ecosystem management programs.** Review the effects of recent management decisions to inform new decisions, priorities, and management trajectories association with the diversity of aquatic and riparian species in the Lake Champlain ecosystem.	Solicit outside consultant to evaluate outcomes of management decisions to inform new management priorities, support monitoring of restoration projects to determine long-term effects	Analysis of effects of funding cycles to inform new management priorities (decision feedback loop) associated with the Lake Champlain ecosystem.

Partner Management Plans related to this strategy:
U.S. Fish and Wildlife Service, Lake Champlain Fish and Wildlife Conservation Office, Dwight D. Eisenhower and White River National Fish Hatcheries - Fisheries Restoration, Assessment and Research

Restoration of natural populations of landlocked Atlantic salmon in the Lake Champlain Basin requires understanding and addressing multiple limiting factors for this priority species. The states of Vermont and New York and U.S. Fish and Wildlife Service have established a high quality lake fishery for salmon that is supported by stocking hatchery reared yearlings in combination with a highly successful sea lamprey control program. Salmon are now entering rivers trying to spawn in the fall. The U.S. Fish and Wildlife Service in cooperation with the states and local universities, is leading a long-term assessment and research program to enhance and restore river run salmon populations. Projects are currently focused on opportunities to improve return rates of adults to focal rivers by characterizing homing and imprinting cues and identifying physiological indicators of smoltification. Now that spawning runs of salmon have been established, USFWS is quantifying impact of thiamine deficiency (caused by eating non-native alewife) on migration and reproductive performance and assessing options for improving performance. Downstream passage of smolts through three main stem dams in one focal river as well as response to a main stem dam removal in other focal river are also being evaluated. Results from these projects demonstrate potential for rapid increases in the success of Atlantic salmon reintroduction efforts using hatchery-reared smolts combined with targeted research, assessment and adaptive management. The Dwight D. Eisenhower and White River National Fish Hatcheries are assisting the States of Vermont and New York with rearing and stocking lake trout for Lake Champlain and other lakes. The Lake Champlain Fish and Wildlife Conservation Office is also assisting Québec in restoration efforts for American eel in Lake Champlain and the greater St. Lawrence River by conducting eel surveys in Lake Champlain to monitor success of stocking efforts and new passage facilities. https://www.fws.gov/lcfwro/

Objective II.C. Prevent the Spread of Aquatic Invasive Species

Aquatic invasive species (AIS) are non-native species that cause harm to the environment, economy, or to human health. Human activities on the landscape can promote movement of aquatic invasive species among different waterbodies. AIS are a leading cause of the loss of biodiversity, second only to loss of quality habitat. Education and outreach to targeted audiences such as the boating community, water gardeners, anglers, and aquarium and pet owners will help prevent the spread of new and existing AIS in the basin.

Strategy	Task Area	Anticipated Output	Outcomes
Strategy II.C.1: Preventing New Invasions: Early Detection and Rapid Response (EDRR) Under this strategy, LCBP will work with Lake Champlain management partners to monitor for and respond to invasions of aquatic species, and to educate different stakeholders about how their behavior can affect the spread of AIS. Task areas within the strategy will work to accomplish the following: a. Conduct and coordinate AIS monitoring (EDRR) b. Provide AIS Rapid Response Support c. Assist partners with rapid response and other AIS management plans d. Maintain involvement in regional and national AIS programs	**II.C.1.a: Conduct and coordinate AIS monitoring (EDRR). Conduct and coordinate AIS monitoring via the Lake Champlain Long-Term Monitoring Program (LTMP) and support early detection of the spread of existing AIS to new bodies of water in the basin or new arrivals of AIS to basin waters.	LTMP annual reports on AIS early detection and tracking of new AIS arrivals to the Basin.	Support for the Long-Term Monitoring, water chestnut control, and boat launch steward programs, and the rapid response fund for AIS emergency containment and management through 2022.
	**II.C.1.b: Provide AIS Rapid Response Support. When new species are identified early enough in the invasion process they sometimes can be contained and controlled and in some cases eradicated. Resources	Rapid Response Task Force determines if containment, management or eradication are feasible for a new infestation in the basin within weeks of a confirmed	LCBP supports the AIS Management Coordinator position and AIS rapid response fund for the Rapid Response Task Force to take immediate action to contain, manage, or eradicate an AIS.

	must be ready to be mobilized (in the form of personnel, equipment, and funding) quickly to prevent the spread of the AIS invasion.	new species or spread of an existing species to a new body of water.	Maintain a fully functioning Rapid Response Task Force
	**II.C.1.c: Assist partners with rapid response and other AIS management plans.	Implementation of targeted management responses to new invasion within timeframe identified in the Rapid Response Management Plan for the Lake Champlain Basin.	LCBP support for the AIS Management Coordinator position to coordinate and collaborate on implementation of the Lake Champlain Basin Aquatic Nuisance Species Management Plan and other AIS management initiatives and rapid response efforts/planning in the basin.
	**II.C.1.d: Maintain involvement in regional and national AIS programs.	The Lake Champlain Basin ANS Management Plan will be maintained and application for USFWS funds to implement the plan submitted annually. The AIS Management Coordinator will continue to represent LCBP as a member of the national	Engagement in national and regional AIS programs (ANS Task Force and Northeast Aquatic Nuisance Species Panel). AIS Management Coordinator will learn from and contribute to regional and national partnerships addressing early detection, rapid response

		ANS Task Force and NEANS Panel, participate in national and regional projects with direct benefits to the basin.	planning, species specific control technologies, and new technologies (e.g. eDNA) for EDRR and management of infestations, support regional AIS spread prevention programs and conduct AIS outreach and campaigns with consistent messaging.
<u>Strategy II.C.2: Reduce AIS Spread Along Pathways</u> Under this strategy, LCBP will 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 use, water gardening, and aquarium dumping through targeted education and outreach campaigns aimed to change behaviors that may help to spread AIS. Task areas within this strategy will work to accomplish the following: a. Intercept AIS transportation on watercraft and equipment	**II.C.2.a: Intercept AIS transportation on watercraft and equipment.** Lake Champlain is a popular destination for many boaters who like to swim, fish, waterski, or simply pleasure boat and view wildlife in the region. Visitors come from many different states and provinces to visit Lake Champlain, trailering their boats and equipment from many different bodies of water. If boats, trailers and equipment are not cleaned, drained and dried they may carry unwanted invasive species hitchhikers.	Increase the number of boat launch stewards and boat wash stations on Lake Champlain and in the basin, targeting launches or waterbodies with known AIS with outbound traffic to uninvaded waterways. This task area will produce annual program summaries of the number of AIS intercepted coming into or leaving Lake Champlain and tracking AIS	Support for this task area will result in a continued increase in boater awareness of AIS issues and spread prevention measures they can take to reduce their risk of spreading AIS among waterbodies.

b. Support implementation of an AIS barrier on the Champlain/Chambly canals	Education and outreach programs inform visitors of the steps they can take to help prevent the spread of invasive species.	spread prevention behavior of boaters over time.	
	II.C.2.b: Support implementation of an AIS barrier on the Champlain/Chambly canals. The greatest number of non-native and aquatic invasive species have entered Lake Champlain through the canal pathways. Research and installation of a barrier to reduce the spread of aquatic invasive species through the Champlain and Chambly canals will prevent further invasions of species to Lake Champlain from the Hudson, St. Lawrence, and Great Lakes systems.	LCBP will support a NYS Canal Corporation and USACE project to determine the feasibility of a barrier on the Champlain Canal.	The threat of introduction and spread of AIS into and out of Lake Champlain through the canal systems will be reduced or eliminated.

<u>Strategy II.C.3: Support and Conduct AIS Management and Research</u> Under this strategy, LCBP will work with Lake Champlain management partners to support and conduct AIS management and research in the basin. Task areas within this strategy will work to accomplish the following: a. Reduce and contain AIS populations in the Basin b. Research new control technologies and AIS impacts to the environment, economy, and human health	**II.C.3.a: Reduce and contain AIS populations in the Basin.** There are a number of water bodies in the basin with invasive species populations that are currently managed by hand pulling, benthic barrier matting, suction harvesting, and pesticides. Some infestations are managed to reduce or eliminate the population and other large infestations are managed at a maintenance level where annual efforts prevent the species from expanding further in the waterbody or to other susceptible waterbodies.	Continued LCBP support for water chestnut management efforts in Lake Champlain and aquatic invasive species spread prevention grants to lake associations.	Support for this task area will continue to reduce the number of acres of water chestnut managed by mechanical harvester in Lake Champlain and the amount of AIS removed from Lake Champlain water bodies.
	II.C.3.b: Research new control technologies and AIS impacts to the environment, economy, and human health. LCBP staff will remain connected to new and innovative research and spread prevention programs capable of addressing AIS concerns in the Lake Champlain watershed. Connections will be	This task area will address the landscape-level spread of AIS in the basin using the boat launch steward data and by examining new research on species impacts and control technologies	Examination of steward and other AIS-related databases and control technologies will inform management strategies and target certain access points or species.

	made between existing AIS, new potential invasions, and the impacts of these invasions or potential invasions to the Lake Champlain ecosystem, human health, and the regional economy.		
<u>Strategy II.C.4: Conduct AIS Public Outreach</u> Under this strategy, LCBP will work with Lake Champlain management partners to deliver education and outreach behavior change campaigns targeted at the general public and targeted water user groups (aquarium owners, boat owners, water gardeners, etc.). It is essential that bilingual AIS spread prevention campaigns are developed that address multiple pathways and promote the national Clean, Drain, and Dry Stop Aquatic Hitchhikers messaging program. Task areas within this strategy will work to accomplish the following: a. Support programs that improve AIS spread prevention behaviors	**II.C.4.a: Support programs that improve AIS spread prevention behaviors	This task area will develop and promote AIS educational brochures, videos, PSAs, and social media tools developed and targeted at different user groups (aquarium trade, water gardens, scuba divers, boaters, bait fish users and dealers, canal systems).	Increased awareness by stakeholder groups about AIS spread prevention issues and increase in spread prevention behavior among high-risk boating groups.

Related Partner Watershed Management Plans:

The USACE Aquatic Plant Control (APC) program enables USACE to work with other federal and non-federal agencies in comprehensive programs for the control of aquatic invasive plants. The Aquatic Plant Control program for the State of Vermont is in the Lake Champlain Basin.

U.S. Fish and Wildlife Service Lake Champlain Fish and Wildlife Conservation Office; Lake Champlain Fish and Wildlife Management Cooperative - Sea Lamprey Control

U.S. Fish and Wildlife Service collaborates with the New York State Department of Environmental Conservation and the Vermont Fish and Wildlife Department as part of the Lake Champlain Fish and Wildlife Management Cooperative to control sea lamprey in the Lake Champlain Basin. The sea lamprey is a parasitic fish that has affected the native lake trout and landlocked Atlantic salmon populations in Lake Champlain most severely while also depressing the populations of other species such as lake trout, walleye and the endangered lake sturgeon. Sea lamprey control is essential for restoration of Lake Champlain's fisheries. USFWS and partners follow a 5-Step adaptive management process to evaluate and manage sea lamprey in Lake Champlain. https://www.fws.gov/lcfwro/

Lake Champlain Rapid Response Plan: In May 2009, the Lake Champlain Steering Committee approved the Lake Champlain Basin Rapid Response Action Plan for Aquatic Invasive Species. This plan is intended to ensure that appropriate protocols, trained personnel, equipment, permits, and other resources are in place to contain and potentially eradicate newly detected nonnative aquatic invasive species as they are reported in the Basin. Task Force members from Québec, New York, and Vermont have been appointed to respond to and oversee rapid response actions.

GOAL III: Foster Thriving Communities

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 society or sustainable watershed must include communities that are thriving, economically and culturally, in a way that is compatible with the protection of water quality and natural resources. Social and economic objectives are cornerstones of traditional definitions of sustainable development. While economic development is beyond the purview of the LCBP and this management plan, the organization can take steps to support and inform efforts by the business community and industry to implement lake-friendly practices that also can contribute to financial objectives in a variety of economic sectors.

An important first step in articulating the value of a clean lake to the regional economy is a comprehensive assessment of the value of both ecosystem services and the direct financial benefit to the business community, including revenues from recreation and tourism. Working with the business community, including producers such as 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. For more than a decade, the LCBP has 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, can provide incentives for businesses to adopt more water-wise practices and exhibit leadership.

Often there is a need in communities to facilitate dialogue among community members, whether they are citizens, local municipal officials, or regulators at the state, provincial and federal levels. With the multiple political jurisdictions and partners working to improve water quality in the Basin, one of the LCBP's central roles is to not only coordinate the dispersal of resources and efforts, but also to facilitate this dialogue and broker the exchange of information and regulatory requirements. This often takes the form of facilitating public meetings and supporting the dissemination of technical knowledge through trainings and outreach events.

Much of the work to improve water quality and ecosystem integrity is accomplished by local entities, such as watershed groups, lake associations, municipalities, educational institutions, and other organizations that are embedded within the communities in which they work. Their employees and board members often live in the communities, and much of their work is supported and carried out by volunteers. For this reason, LCBP provides local implementation grants across technical and education and outreach programs that are critical in getting work done on the ground, and in engaging citizens toward the protection of these resources. In addition to financial support, the LCBP aids these local organizations by providing training and access to technical resources through events, such as an annual meeting of Lake Champlain watershed groups and other collaborative efforts where community members have the opportunity to compare notes and learn from the efforts of others.

The history of most of the communities within the Basin is inextricably tied to Lake Champlain and the tributaries that feed it. These interconnected waterways wholly defined the lifeways and character of these towns, villages, and hamlets. An understanding of this past and the historical objects and resources that represent our cultural heritage is critical in fostering an appreciation and valuation of them that leads to their stewardship. The Champlain Valley National Heritage Partnership (CVNHP) works on many fronts to protect and promote this cultural heritage, and as such the CVNHP Management Plan is integrated into OFA by reference.

The CVNHP's Management Plan outlines numerous programs to protect historical resources and interpret their significance for the public. These tasks address long-standing LCBP goals of fostering stronger personal connections between people and resources of the Lake Champlain basin while supporting the local economy through recreational opportunities. Included in this management plan by reference to specific tasks in the CVNHP, the tasks support research that identifies significant historical and archaeological artifacts and resources, protect and preserve them for future generations, and explain how this past and the resources that represent it has shaped communities and their relationship with the lake.

The Lake Champlain Steering Committee has identified a suite of priorities to reach the goal of thriving communities in the Lake Champlain watershed. LCBP will serve a role to meet each of these priorities:

- Management partners, members of the public (including the business community) become better informed about watershed issues and take actions to improve condition of the lake.
    - The LCBP will facilitate dialogue about resource stewardship and exchange of information between all members of communities within the Basin.
- Increased citizen understanding of LCBP and partner projects funded with public money that are implemented to clean up and protect the lake.
    - The LCBP will serve as facilitator and coordinator of research, management, and implementation activities that result in improvements to the condition of the Lake and watershed.

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. Some measures of a thriving community, such as economic vibrancy, are relatively easy to track. Metrics for progress are more difficult to define and measure for less tangible characteristics like a strong sense of place, community pride, or even environmental and social resiliency to flooding and climate change. The effects of assisting partners with meeting facilitation, 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 as a result of technical projects conducted subsequently by their participants. Long-term changes in citizens' knowledge of water quality issues and changes in behavior are best evaluated with both program-specific evaluations and long-term broad-scale surveys (see Goal IV: Informed and Involved Public). LCBP will work with partners to identify opportunities to evaluate the impact of

our programs and determine the rate at which communities and networks within the Basin are adopting water quality improvement measures.

Objective III.A: Engage and Support Community & Management Partners

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

Strategy	Task Area	Outputs	Outcomes
III.A.1— Support local watershed groups	***III.A.1.a – Financial Resources****** Provide funds for local watershed groups to implement projects ***III.A.1.b – Technical Resources**** Provide technical assistance through meetings, workshops, and presentation ***III.A.1.c – Targeted watershed E&O projects*** Develop and implement local grants program to specifically support priority watersheds: Missisquoi, St. Albans Bay, South Lake A and B	Award local implementation grants annually Conduct annual watershed organization meeting	Collectively, many of the task areas identified in this objective and the specific tasks supported as part of the annual budget process will achieve a long-term increase in the public's knowledge of watershed issues and changes in personal behavior. Members of the public who are informed about watershed issues are more likely to take and/or encourage stewardship actions that either improve the Lake or decrease impacts. Better understanding of LCBP's work and progress will also lead citizens to be more supportive of the projects undertaken with public money to clean up and protect the Lake.
III.A.2 – Facilitate and coordinate public messaging with management partners	***III.A.2.a –Annual Meeting*** Conduct annual meeting to share LCBP activities and accomplishments ***III.A.2.b – Meeting Facilitation**** Assist partners with facilitating public meetings to inform the public about new legislation, programs, and initiatives. ***III.A.2.c – Technical Issue Training*** Support seminars, workshops, and conferences to deliver technical information on topics such as BMPS, LID, stormwater management technologies, roads management, etc. to municipal and state staff	Conduct meeting annually Meetings conducted on an as-needed basis. Three programs delivered per OFA cycle.	

III.A.3 – Enhance flood resilience and climate change adaptation in community planning and development	*III.A.3.a – Outreach* Support and advise municipalities' efforts to educate residents about sound river/floodplain management	Three workshops within OFA update cycle; advise/facilitate meetings on as-needed basis.
III.A.4—Serve as a conduit for information, build professional capacity among stakeholders, and foster strong working relationships among the partners of the CVNHP.	**III.A.4.a: Support professional development among CVNHP stakeholders, including an annual heritage partnership conference. **III.A.4.b: Encourage cooperation and enhance communication among partners within the CVNHP.	Host the annual CVNHP International Summit and forward professional development opportunities as they arise. Provide annual funding to support the CVNHP regional stakeholder groups

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	Outputs	Outcomes
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 initiative *III.B.1.b – Innovation Development* Provide support to local business to develop and showcase new and innovative practices that support clean water	One initiative developed within OFA update cycle. One initiative to fund new practice/technology in OFA update cycle	Collectively, many of the task areas identified in this objective and the specific tasks supported as part of the annual budget process will achieve a long-term increase in the public's knowledge of watershed and cultural heritage issues and changes in personal behavior. Members of the public who are informed about watershed issues and the rich cultural heritage of the region are more likely to take and/or encourage stewardship actions that either improve the Lake or decrease impacts. Better understanding of LCBP's work and progress will also lead citizens to be more supportive of the projects undertaken with public money to clean up and protect the Lake and associated heritage and recreation resources.
III.B.2 – Assess value of clean water to regional economy	*III.B.2.a – Economic analysis* Conduct valuation of clean water and healthy watershed	Assessment completed within OFA update cycle	
III.B.3 – Support working landscapes that help protect water quality	*III.B.3.a – BMP Implementation* Provide financial and technical assistance to support practices that help protect water quality *III.B.3.b – Outreach Assistance* Support producers' efforts to promote their actions to protect water quality *III.B.3.c – Awards Program**** Continue and implement new programs that recognize effective practices to protect water quality	one initiative implemented per OFA update cycle One outreach initiative in OFA update cycle Annual awards	
III.B.4 – Support implementation of green stormwater infrastructure (GSI)	*III.B.4.a – Awards/Recognition Program* Initiate a program that recognizes effective implementation of GSI	Establishment of one program in OFA update cycle.	
III.B.5—Coordinate efforts among partners to promote the CVNHP as a	*III.B.5.a* Develop and maintain a consistent regional brand	Each year, focus on one of the three interpretive themes of the CVNHP.	

world-class destination for heritage travelers.	related to the interpretive themes of the CVNHP. *III.B.5.b* Use the CVNHP website to promote the region. *III.B.5.c* Support the development of bilingual materials, interpretation, and services.	Update and maintain the website as needed. Provide translation services as needed.
III.B.6—Foster a sustainable relationship between people and the natural and cultural resources of the CVNHP	*III.B.6.a* Promote energy efficiency and resource conservation among CVNHP partners. *III.B.6.b* Focus on land use changes and effects of stormwater runoff on water quality. *III.B.6.c* Promote sustainable agriculture practices in the CVNHP.	Encourage carpooling and the use of teleconference calls Provide free wayside exhibit design services for interpreting stormwater. Produce and distribute a CVNHP agricultural/gardening guide.

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	Outputs	Outcomes
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: Provide support for needed historical and archeological research, and accelerate the identification, evaluation, protection, and interpretation of heritage resources, including ethnographies of the cultures within the CVNHP.	Provide five CVNHP grants annually to implement Strategy III.C.1	Tasks and outputs under this strategy will increase accessibility of CVNHP resources to stakeholders and community groups

	III.C.1.b: Manage a comprehensive online heritage resource database.	Staff and RSG coordinators will annually review and update the resource database	
III.C.2—Support the conservation of the historical, archeological, natural and cultural resources of the CVNHP	III.C.2.a: Develop a voluntary stewardship program to strengthen non-regulatory protection of cultural and natural heritage resources. III.C.2.b: Develop and implement CVNHP cultural and natural heritage resource protection programs. III.C.2.c: Develop and implement a management strategy for underwater cultural heritage (CH) resources in the CVNHP.	Volunteer opportunities built with partner groups to raise awareness of cultural and natural heritage resources. Grant programs supporting protection of CVNHP heritage resources. Convene an annual meeting among underwater cultural heritage resource stakeholders	Tasks and outputs under this strategy will raise awareness of cultural and natural heritage resources throughout the CVNHP and will promote protection of these resources

Objective IV.D: Support Lake & 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	Outputs	Outcomes
III.D.1—Provide sustainable and accessible recreational opportunities for everyone within the CVNHP	**III.D.1.a: Support initiatives that promote sustainable recreational activities that feature the natural, cultural, and historical resources in the CVNHP.	Provide information on recreation opportunities on the CVNHP website	
	III.D.1.b: Increase and improve public access opportunities to the waterbodies of the basin and interconnected waterways of the CVNHP for diverse recreational activities.	Annually, fund one recreation project that supports sustainable and accessible recreation and interprets the resources featured.	Increased public access to waters in the basin and the CVNHP for residents and visitors
	**III.D.1.c: Support a public information program that emphasizes recreational ethics, public safety, sustainable use, and stewardship of cultural and natural resources	Include an AIS message on all water-based products developed through CVNHP funding	

Partner Programs

U.S. Fish and Wildlife Service, Lake Champlain Fish and Wildlife Conservation Office, Schoolyard Habitat Program

The mission of the Schoolyard Habitat Program in the Lake Champlain Basin is to get students outside to experience nature. To accomplish this, biologists help schools create natural spaces on school grounds where students can observe, draw, write, think and question. Schoolyard Habitat projects provide habitat for local and migratory wildlife, including songbirds, small mammals, reptiles, amphibians, and insects. In many cases, these habitats also provide a vegetative buffer to nearby streams, lakes and wetlands, reducing pollution reaching these waterways.
https://www.fws.gov/lcfwro/

GOAL IV: Inform and Involve the Public

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 and support healthy ecosystems and cultural resources.

Introduction

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 both 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 actively involve people in protecting and appreciating the resources of the entire Basin. Ultimately, a public that understands the Basin's water quality and resource management problems as well as possible solutions can make informed choices about protection and restoration. 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.

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

The LCBP and its 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.

In addition to formal education efforts, the LCBP will continue to build awareness among all age groups of watershed issues through informal and less structured outreach. Central to this objective is the need to interpret 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 watershed 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 capabilities.

The *State of the Lake and Ecosystem Indicators Report,* the LCBP's most prominent outreach piece, informs citizens about the Lake's condition and provides an update to policy makers and elected officials. The LCBP Resource Room at ECHO, Leahy Center for Lake Champlain in Burlington is also a significant element of outreach efforts. Staff at the Resource Room reach as many as 29,000 of ECHO's visitors (approximately 25% of total ECHO visitation) each year. Other key LCBP education and outreach efforts include the *Love the Lake Speaker Series*, WTPZ's *Champlain Connection*, Radio Vermont's "Get out on the Lake" PSA series, and the many fairs, festivals, and other public events where LCBP staff and partners interact with the public each year. Interpretation and partnership building are the CVNHP's greatest strengths. The program has developed more than 300 wayside exhibits that forge connections between the public and the region's natural and cultural resources.

The most successful education and outreach efforts inspire and facilitate citizen action. By making available information about lake-friendly products and practices, and by supporting the efforts of local watershed organizations, marine operators, 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.

The Lake Champlain Steering Committee has identified a suite of priorities to reach the goal of informing and involving the public within the Lake Champlain watershed. LCBP will serve a role to meet each of these priorities:

- Members of the public are better informed about watershed issues and are more likely to take stewardship actions that improve the condition of the Lake.
    - The LCBP will work independently and in collaboration with management partners to deliver formal and informal education and interpretation programs, and to disseminate information in a variety of media, including print and electronic.
- With a better understanding of the work and progress toward improvement of the Lake, citizens will be more supportive of the projects undertaken with public money to clean up and protect the Lake.

- LCBP will publish the *State of the Lake and Ecosystems Indicator Report* every three years, and will report on its activities and those activities of partners conducted in collaboration with the LCBP through a variety of media, including an annual report of activities.

Measures of Success

Determining the outcomes of education and outreach efforts is significantly more challenging than it is for direct environmental management interventions such as phosphorus reduction projects or actions to prevent the spread of invasive species. The ultimate outcome of these efforts is behavior change. The on-the-ground impacts of specific projects that inform and involve the public are very difficult to determine, because once a program is delivered, the ability to follow up with participants or audiences is limited, particularly over the long term. While program-specific evaluations capture participants' perceptions and intentions for future behavior, lasting behavior change takes some time to occur. Evaluations of outreach efforts are helpful in comparing their effectiveness, but identifying desired environmental outcomes for specific outreach tasks is not the most efficient method of tracking progress. Most assessments of environmental behavior change performance measures point to surveys as being the most effective means to evaluating broad-scale, long-term behavior change.

Surveys that are consistently structured and administered at the beginning and end of the OFA implementation cycle will track and report on the environmental outcomes achieved by the outputs listed in the table below. The partnership approach that characterizes much of the LCBP's education and outreach work is essential in carrying out these programs, but it also poses an additional challenge in evaluating outcomes. Any surveys must be conducted in concert with the same partners who collaborate in delivering programs. A survey of this nature would be broad in scope, in terms of geographic extent, range of issues, and demographics targeted.

Long-term surveys will be complemented by evaluations of the specific programs listed as outputs. These evaluations help to gauge the effectiveness of these efforts, and allow comparisons of their relative merit that might then inform a strategic communications plan that lays out a road map for LCBP education and outreach efforts within the broader context of efforts conducted by partners, both with the LCBP and independently.

Effective surveys require strong funding support. Like all task areas in the plan, a survey of the public's understanding of the issues and behaviors that affect the watershed must be identified as a priority and supported as part of the annual budget process. Ideally this type of survey is conducted as part of a longitudinal study that looks at change over time. Annual budget tasks that fund surveys should take this into account, appropriating sufficient funds for long-term work.

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	Outputs	Outcomes
IV.A.1— Implement Programs for K-12 students	*IV.A.1.a – School Programs**** Deliver classroom instruction that increase knowledge of watershed science among K-12 students *IV.A.1.b – Field Programs* Conduct field-based instruction and activities that provide hands-on knowledge of watershed science among K-12 students	Programs in 10 schools each year. Programs with 3 schools each year	Collectively, the task areas identified in this objective and the specific tasks supported as part of the annual budget process will achieve a long-term increase in the public's knowledge of watershed issues and changes in personal behavior. Members of the public who are informed about watershed issues are more likely to take and/or encourage stewardship actions that either improve the Lake or decrease impacts. Better understanding of LCBP's work and progress will also lead citizens to be more supportive of the projects undertaken with public money to clean up and protect the Lake.
IV.A.2 – Maintain and expand Digital/Online Tools and Resources (WatershED Matters, Atlas)	*IV.A.2.a – Web Outreach* Redevelop web resources, Update design and content of existing web sites. *IV.A.2.b – Social Media* Establishment social media presence for education efforts	Conduct annual review and update of online education resources for relevant content and appropriate application of current technologies. Engagement of CBEI/WEC participant and alum on social media sites	
IV.A.3 – Provide professional development for teachers	*IV.A.3.a – Professional Development Trainings**** Deliver instruction in watershed content and pedagogy for K-12 teachers via CBEI and other workshops *IV.A.3.b – Curriculum Development* Disseminate resources and curriculum materials developed as part of CBEI workshops and WEC programs	WEC program offered on two-year cycle; two CBEI one-day workshops each year; 50 teachers reached annually, 5 instructional modules developed All resources and curriculum materials developed through CBEI programs are posted online	

IV.A.4 – Engage youth in stewardship opportunities	*IV.A.4.a – Community Service Projects* Community service projects focused on water quality and ecosystem integrity in K-12 school	Implement community service projects in one school each year.
	IV.A.4.b – Youth Volunteer Programs Recruit youth in volunteer initiatives to conduct watershed restoration projects	One volunteer work day each year focused on youth.
	IV.A.4.c – Summer Youth Programs Deliver summer camp programs focused on hands-on water quality education and conservation practices	Three camps/ 100 campers each year
IV.A.5—Have a well-informed public that values the unique heritage of the CVNHP and understands the threats to those resources	**IV.A.5.a: Connect, promote, and improve cultural and natural heritage sites through interpretation. **IV.A.5.b: Support the use of interpretive themes to link resources within the CVNHP. IV.A.5.c: Promote cultural exchanges and international scholarship programs IV.A.5.d: Produce coordinated education programs for students.	Provide five CVNHP interpretation grants annually Focus funding on one of the CVNHP's interpretive themes each year. Include this topic at the Annual International Summit Incorporate the CVNHP themes into the CBEI programming

Objective IV.B: Build awareness through informal learning of Lake Champlain Basin issues across all age groups

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

Strategy	Task Area	Outputs	Outcomes
IV.B.1— Interpret technical information for the public	***IV.B.1.a – Report on Condition of the Lake****** State of the Lake and Ecosystem Indicators Report	Publish report on three-year cycle	Collectively, the task areas identified in this objective and the specific tasks supported as part of the annual budget process will achieve a long-term increase in the public's knowledge of watershed issues and changes in personal behavior. Members of the public who are informed about watershed issues are more likely to take and/or encourage stewardship actions that either improve the Lake or decrease impacts. Better understanding of LCBP's work and progress will also lead citizens to be more supportive of the projects undertaken with public money to clean up and protect the Lake.
	IV.B.1.b – Non-personal Interpretation Develop wayside and interpretive exhibits, brochures, fact sheets, and other print materials that explain watershed issues and concepts	Develop and install interpretive materials at one site every two years	
	IV.B.1.c – Personal Interpretation*** Deliver face-to-face, interactive interpretation with members of the public.	Reach 30,000 people each year through Resource Room interactions, and 6-10 field-based outreach opportunities;	
	IV.B.1.d – Public Presentations Deliver issue-specific presentations and demonstrations to foster public understanding and inspire action	20 presentations each year	
	IV.B.1.e – Web/Electronic Outreach*** Produce video and other dynamic media for LCBP websites	Publish *Casin' the Basin* e-news quarterly; sustained social media activity (10-15 posts per week).	
	IV.B.1.f – Print Publications Design and develop print materials to inform public of issues and progress made by stakeholders to address issues	Report of activities published annually; other materials developed on as-needed basis	

Objective IV.C: Facilitate changes in behavior and actions of citizens

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	Outputs	Outcomes
IV.C.1— Promote hands-on citizen action	*IV.C.1.a – Web/Social Media outreach* Connect citizens with local organizations' volunteer programs	Volunteer opportunity of the month	Collectively, the task areas identified in this objective and the specific tasks supported as part of the annual budget process will achieve a long-term increase in the public's knowledge of watershed issues and changes in personal behavior. Members of the public who are informed about watershed issues are more likely to take and/or encourage stewardship actions that either improve the Lake or decrease impacts. Better understanding of LCBP's work and progress will also lead citizens to be more supportive of the projects undertaken with public money to clean up and protect the Lake.
IV.C.2 – Promote lake-friendly products and practices	*IV.C.2.a – Outreach materials* Produce web content and print materials that describe lake-friendly products and practices.	Review web content annually for relevance; produce print materials as need/opportunities are identified	
IV.C.3 – Promote engagement among and between citizens	*IV.C.3.a – Social Marketing* Implement social marketing techniques to foster sharing of information and stewardship ethic. *IV.C.3.b – Citizen Media Competition**** Implement a photo/video contest with a content sharing mechanism.	One social marketing initiative per OFA cycle. One contest within OFA cycle	
IV.C.4 – Assess changes in the public's knowledge and behavior	*IV.C.4.a – Public Survey* Conduct long-term surveys to track long-term changes in the public's knowledge and behavior, and effectiveness of LCBP E&O efforts	Surveys conducted at the beginning and end of OFA cycle.	

GLOSSARY

Acquisition: in the context of wetlands, to obtain through direct purchase, easement, donation, or other means, in order to protect, enhance, or restore habitat functions and values.
Algae: small aquatic plants which 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 form the base of the aquatic food chain.
Algae bloom or algal bloom: a situation often caused by excess nutrients whereby algae grow and reproduce rapidly, often forming dense mats on the surface of the water. Algae blooms can cause unpleasant conditions for swimmers or boaters.
Aquatic: growing in, living in, or dependent upon water.
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.
Benchmark: a standard against which the success of a program or action may be measured.
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.
Biological indicator (bioindicators): biological characteristic at the cellular, organism, population, or community level that is representative of a given habitat or its ecological condition.
Biomagnification: process whereby harmful substances become increasingly concentrated in tissues or internal organs of organisms with each step up the food chain.
Biota: the animal or plant life of a region.
Blue-green algae/cyanobacteria: known as the most primitive group of algae. Some blue-green algae produce natural toxins.
Brownfield: abandoned, idled or under-used industrial and commercial facility where expansion or redevelopment is complicated by real or perceived environmental contamination.
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.
Byway: a transportation route and adjacent area usually of interest because of particular scenic, historic, recreational, cultural and archeological values. A byway is managed to protect such values and encourage economic development through tourism and recreation.
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 poisoning or the spread of disease. Air and soil can also be contaminated in a similar 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, e.g., a wooded area along a river.
Cost-effective: in environmental policy-making, the least cost means of 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 archeological past reflected in existing culture.
Cultural heritage resources: the physical record and memory of the past.
Database: a collection of data arranged for ease and speed of retrieval.
Dioxin: any of a family of compounds known chemically as dibenzo-p-dioxins. Dioxins are sometimes generated by industrial processes, and can contaminate water and soil. Tests on laboratory animals indicate that it is one of the most toxic man-made chemicals known.
Drainage basin: land area from which water flows into a river or lake, either from streams, groundwater, or surface runoff (see Basin or Watershed).
Easement: an agreement by which a landowner gives up or sells one of the rights on his/her property. For example, a landowner may donate a right of way across his/her property to allow community members to access to the 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 and county 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.
Endangered species: a species in immediate danger of becoming extinct.
End-of-pipe: at the point of discharge to the environment.
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.
Eutrophic: from Greek for "well-nourished," it describes a lake with low water clarity and excessive plant growth due to high concentrations of nutrients.
Eutrophication: the slow, natural process of aging of a lake, estuary, or bay. Dissolved nutrients enter the water body, often leading to excess plant growth and decreased water quality. As the plants die, they are decomposed by microorganisms which use up dissolved oxygen vital to other aquatic species such as fish. Over very long periods of time, the decaying plant matter builds up

and causes the lake to fill in to form a bog or marsh. Human-caused eutrophication can speed up this natural process.

Exotic species: a species which is not native or which is introduced from another location.

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.

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

Geographic Information Systems (GIS): a computer system that is used to compile, store, analyze and display geographic and associated data tables. This system can be used to produce maps which overlay information layers of locations of various environmental and physical features.

Geomorphic: pertaining to forms on the surface of the earth and the processes that developed those forms. A geomorphic analysis considers drainage patterns, river channels, floodplains, terraces and other watershed features and how they have changed over time.

Grassland agriculture: the use of grass, legumes and/or hay to achieve livestock dietary requirements without the need for corn silage.

Guidelines: standards or principles by which to make a judgment or determine a policy or course of action.

Habitat: the place where a particular type of plant or animal lives. An organism's habitat must provide all of 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.

Hazardous waste: any solid, liquid or gaseous substance that is a by-product of society and classified under state or federal law as potentially harmful to human health or the environment. Hazardous wastes are subject to special handling, shipping, storage and disposal requirements and possess at least one of the following four characteristics: ignitability, corrosivity, reactivity or toxicity.

Health risks: anything which may reduce human health. These may be ranked according to high, moderate and low risk.

Household hazardous waste: substances found in the home which contain hazardous materials (which should be disposed of properly to prevent pollution to the air, groundwater and surface water.)

Hydrodynamics: the study of how water flows from one area to another.

Hypereutrophic: describes a lake characterized by an excess of nutrients. These lakes usually support algal blooms, vegetative overgrowth, and low biodiversity.

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.

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.
Manage: to control the movement or behavior of; to manipulate.
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.
Mass balance approach: an approach to managing chemicals that relies on balancing inputs and outputs.
Mesotrophic: a moderately nutrient-enriched lake, between oligotrophic and eutrophic.
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.
Non-native: in this Plan, not originating naturally in the Lake Champlain Basin.
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 having adverse ecological and/or economic impacts.
Nutrient: a substance 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, especially algae. Some nutrients can be toxic to plants and animals at high concentrations.
Nutrient management: an integrated approach designed to maximize the efficient use of nutrients, particularly phosphorus which is found in animal manure and fertilizer.
Oligotrophic: from the Greek for "poorly nourished"; describes a lake, with low plant growth and high clarity. Oligotrophic lakes contain little organic matter and have a high dissolved oxygen level.
Pathogens: organisms, usually viruses, bacteria or fungi, capable of causing disease.
PCBs: polychlorinated biphenyls. A group of manufactured chemicals, including about seventy different but closely related compounds made up of carbon, hydrogen and chlorine, used in transformers and capacitors for insulating purposes. If released to the environment, PCBs do not break down for long periods and can biomagnify in food chains. PCBs are suspected of causing cancer in humans and other animals. PCBs are an example of an organic toxic chemical.
Perennial crop: An agricultural commodity that is produced from the same root structure for two or more years.
Persistent contaminants: harmful compounds that do not readily degrade in the environment.
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.
Rare species: a species not presently in danger, but of concern because of low numbers.
Restoration: any action taken to repair, maintain, protect, and enhance the ecological integrity of the Basin.
Retrofit: the installation of best management practices (BMPs) to existing infrastructure to improve water quality and lessen other negative impacts associated with urbanization.
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.
Rotational grazing: a pasture management system which uses several paddocks during a grazing season, alternating paddocks to allow for forage re-growth. Livestock generally graze for less than a week before being rotated to another paddock. This system improves vegetative cover and reduces erosion and nutrient runoff.
Runoff: water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.
Sale of development rights: the process of selling the legal right to develop a parcel of land.
Salmonids: a member of the family Salmonidae, which includes salmon, trout and whitefishes.
Sedimentation: the deposition or accumulation of sediment, such as sand, silt or clay.
Sites of concern: areas where toxic substances are found in concentrations greater than acceptable levels, or where several toxic substances are found together.
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. Technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control are all examples of source reduction.
Stewardship: the concepts of responsible caretaking; based on the premise that we do not own resources, but are managers of resources and are responsible to future generations for their condition.
Stormwater runoff: precipitation running off of saturated or frozen soils and impervious surfaces such as paved parking lots, streets or roofs.
Subbasin: 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.
Terrestrial: growing or living on the ground, rather than water.
Threatened area: an area which is in imminent danger of being degraded by pollution.

Threatened species: a species with high possibility of becoming endangered in the near future (see Endangered species).
Total Maximum Daily Load: a TMDL is 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.
Urban runoff: storm water from city streets and adjacent domestic or commercial properties that may carry pollutants of various kinds into the sewer systems and/or receiving waters.
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 is 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.
Zooplankton: very small, free-floating animals found in water bodies.

List of Abbreviations

AAP Accepted Agricultural Practices
ABVR (Action 3.4)
AEM Agricultural Environmental Management
AIS Aquatic Invasive Species
AOP Aquatic Organism Passage
ANC Aquatic Nuisance Control
ANS Aquatic Nuisance Species
APA Adirondack Park Agency
APIPP Adirondack Park Invasive Plant Program
ASCN Aquatic Species Conservation Needs
BCR Bird Conservation Region
BGA Blue-Green Algae
BMP Best Management Practice
CAC Citizens Advisory Committee
CAFO Concentrated Animal Feeding Operation
CBEI Champlain Basin Education Initiative
CBVBM Corporation Bassin Versant Baie Missisquoi
CNMP Comprehensive Nutrient Management Plan
CREP Conservation Reserve Enhancement Program
CRP Conservation Reserve Program
CSA Critical Source Area
CSO Combined Sewer Overflows
CVNHP Champlain Valley National Heritage Partnership
CWICNY Champlain Watershed Improvement Coalition of New York
DFO Department of Fisheries and Oceans (Canada)
DPW Department of Public Works
E&O Education and Outreach
EPF Environmental Protection Fund
EPSCoR Experimental Program to Stimulate Competitive Research
EQIP Environmental Quality Incentives Program
FEH Fluvial Erosion Hazard
FEMA Federal Emergency Management Agency
FFY Federal Fiscal Year
GRISE Integrated soil and water management/Gestion raisonnée et intégrée des sols et de l'eau
GSI Green Stormwater Infrastructure
HACCP Hazard Analysis and Critical Control Point
HAPAC Heritage Area Partnership Advisory Committee
HELP Hydrology for the Environment, Life, and Policy
IJC International Joint Commission
IRDA Research and Development Institute for the Agrienvironment/
l'Institut de recherche et de développement en agroenvironnement

ISPZ Invasive Species Prevention Zone
LiDAR Light Detection and Ranging
LCBP Lake Champlain Basin Program
LCFWMC Lake Champlain Fish and Wildlife Management Cooperative
LCSG Lake Champlain Sea Grant
LID Low Impact Development
LFO Large Farm Operation
LPP Land Protection Plan
MEA Millennium Ecosystem Assessment
MFO Medium Farm Operation
MS4 Municipal Separate Storm Sewer Systems
MTQ Ministère des Transports du Québec
MRC Regional Municipalities/Municipalité Régionale de Comté
NANBO North American Network of Basin Organizations
NAWCA North American Wetlands Conservation Act
NEAEB New England Association of Environmental Biologists
NEANS Northeast Aquatic Nuisance Species
NEAPMS Northeast Aquatic Plant Management Society
NECNALMS New England Chapter of the North American Lake Management Society
NEIWPCC New England Interstate Water Pollution Control Commission
NFIP National Flood Insurance Program
NLA National Lakes Assessment
NMP Nutrient Management Plan
NOAA National Oceanographic and Atmospheric Administration
NPO Nonprofit Organization
NRCS Natural Resources Conservation Service
NWR National Wildlife Refuge
NWS National Weather Service
NYS New York State
NYSCC New York State Canal Corporation
NYSDAM New York State Department of Agriculture and Markets
NYSDEC New York State Department of Environmental Conservation
NYSDOT New York State Department of Transportation
NYSECL New York State Environmental Conservation Law
NYSP2I New York State Pollution Prevention Institute
O&M Operations and Maintenance
OBVBM Missisquoi Bay Watershed Organization/Organisme de bassin versant de la baie Missisquoi
OFA Opportunities for Action
ODEP Diagnostic Tool for Phosphorus Exportation/Outil de Diagnostic des Exportations de Phosphore
ORDR (NIH) Office of Rare Diseases Research (National Institutes of Health)
P Phosphorus
PAHs Polycyclic Aromatic Hydrocarbons

PBDEs Polybrominated Diphenyl Ethers
PBLC Programme Bassin Lac Champlain
PCBs Polychlorinated Biphenyls
PSA Public Service Announcement
RAP Required Agricultural Practices
RFP Request for Proposals
PPCPs Pharmaceuticals and Personal Care Products
PPP Preliminary Project Proposal
Project WET Project Watershed Education for Teachers
QC Québec
QC MDDELCC Ministry of Sustainable Development, Environment and the Fight against climate change du Québec/Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques du Québec
MAPAQ Ministry of Agriculture, Fisheries and Food of Québec/Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec
QC MFFP Ministry of Forest, Wildlife and Parks of Québec /Ministère des Forêts, de la Faune et des Parcs du Québec
QC MSSS Ministry of Health and Social Services of Québec /Ministère de la santé et des services sociaux du Québec
QC SFP Society of Wildlife and Parks of Québec/Société de la Faune et des Parcs du Québec
RFP Request for Proposals
RIBS Rotating Integrated Basin Studies
RMO Regional Marketing Organization
ROW Right of Way
RPC Regional Planning Commission
RSEP Regional Stormwater Education Program
SCS Soil Conservation Service
SGCN Species of Greatest Conservation Need
SDWA Safe Drinking Water Act
SPDES State Pollutant Discharge Elimination System (New York)
SRA Source Reduction Assistance
SRF State Revolving Fund
SSO Sanitary Sewer Overflow
SPDES State Pollutant Discharge Elimination System
SUNY State University of New York
SWCD Soil and Water Conservation District
TAC Technical Advisory Committee
TMDL Total Maximum Daily Load
TNC The Nature Conservancy
TRP Temporary Registration Permit
TU Trout Unlimited
UNESCO United Nations Education, Scientific, and Cultural Organization
USACOE or USACE United States Army Corps of Engineers
USCDC United States Centers for Disease Control and Prevention

USDA-NRCS United States Department of Agriculture – Natural Resources Conservation Service
USDAWS United States Department of the Interior Wildlife Services
USDOI United States Department of the Interior
USEPA United States Environmental Protection Agency
USFS United States Forest Service
USFWS United States Fish and Wildlife Service
USGS United States Geological Survey
UVM University of Vermont
VAAFM Vermont Agency of Agriculture, Food and Markets
VCGI Vermont Center for Geographic Information
VHCB Vermont Housing Conservation Board
VHS Viral Hemorrhagic Septicemia
VIPs Vermont Invasive Patrollers
VOCs Volatile Organic Compounds
VT Vermont
VTACCD Vermont Agency of Commerce and Community Development
VTANR Vermont Agency of Natural Resources
VTRANS Vermont Agency of Transportation
VTDEC Vermont Department of Environmental Conservation
VTDFPR Vermont Department of Forests, Parks and Recreation
VTDHP Vermont Division for Historic Preservation
VTDOH Vermont Department of Health
VTFWD Vermont Fish and Wildlife Department
VNRC Vermont Natural Resources
WEC Watershed for Every Classroom
WNS White-Nose Syndrome
WRDA Water Resources Development Act
WQCC Water Quality Control Commission
WQIP Water Quality Improvement Project
WRP Wetlands Reserve Program
WWTF Wastewater Treatment Facilities
ZIPP Phosphorus Priority Intervention Zone

Appendices

Appendix 1. LCBP Operating Structure, Committees, and Staffing

As a partnership of provincial, state, 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 and economic benefits of the Lake Champlain Basin. The program is guided by the Lake Champlain Steering Committee, a board comprised of a broad spectrum of representatives of government agencies and the chairs of

advisory groups representing citizen lake users, scientists, and educators. 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*. US 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 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. See Figure A1 for an outline of the LCBP Operating Structure.

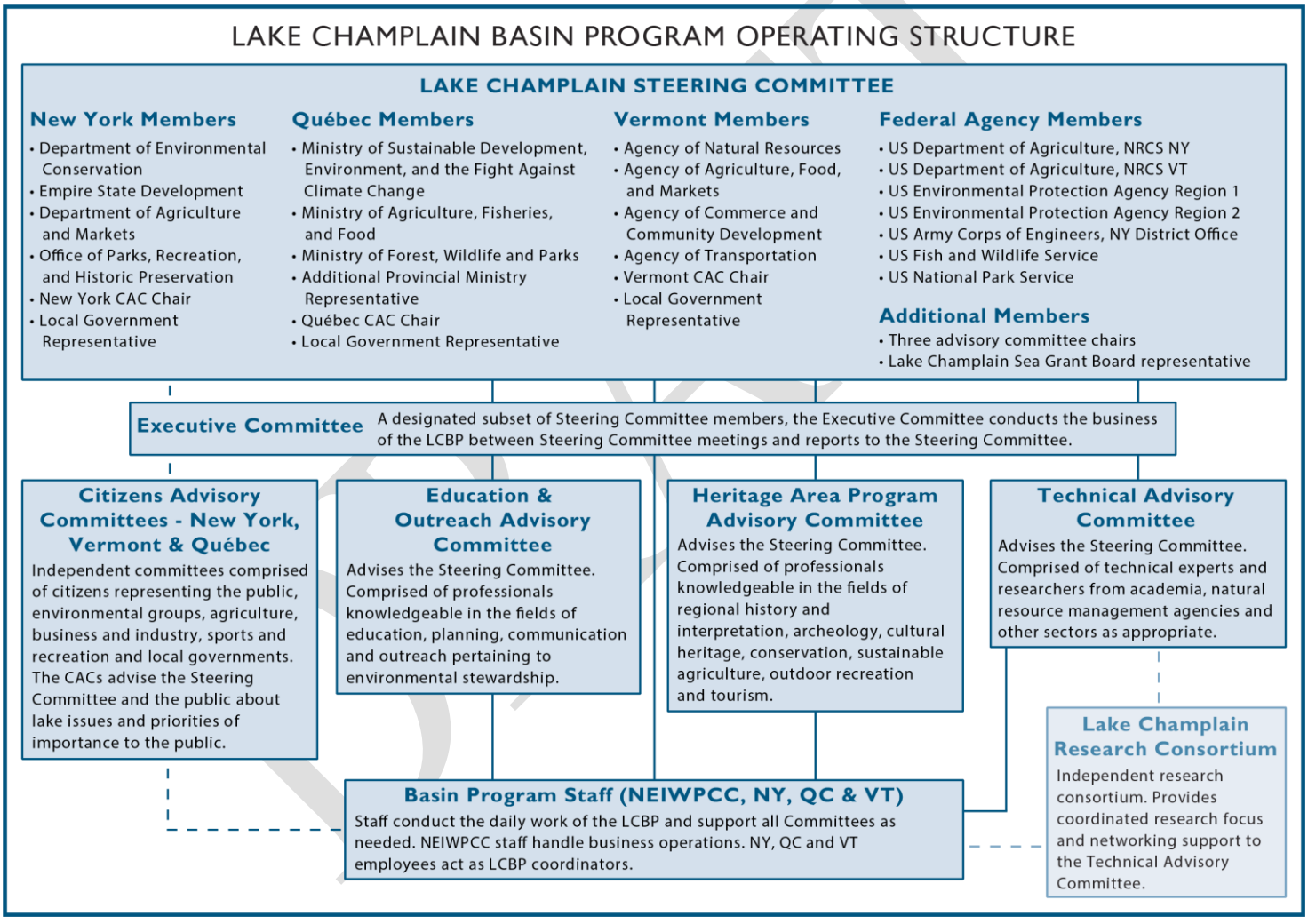


Figure A1. LCBP Operating Structure.

The US Environmental Protection Agency (USEPA), Great Lakes Fishery Commission (GLFC) and National Park Service (NPS) regularly enter into grant agreements with the New England Interstate Water Pollution Control Commission (NEIWPCC) on behalf of the LCBP to implement tasks according to a single coordinated LCBP workplan approved by the Lake Champlain Steering

Committee. Occasionally other federal agencies will enter into agreements with NEIWPCC on behalf of LCBP to implement tasks for their agencies. One recent example is the International Joint Commission, which requested services of the LCBP to coordinate and facilitate a binational Technical Working Group to evaluate opportunities to reduce flooding impacts in Lake Champlain and the Richelieu River. 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 states of New York and Vermont each enter into grant agreements with the USEPA to manage implementation tasks that may be more efficiently accomplished by state personnel, but also are under workplans approved by the Lake Champlain Steering Committee. 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 basin is funded by federal appropriations to other federally funded agencies and commissions. EPA 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 du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Sustainable Development, 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.

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

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.

- 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 du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Sustainable Development, 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 and the corresponding governor or premier is encouraged to 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 with a nonvoting liaison role.

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 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. The interested party should 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*. The letter also should 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 new organization should 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.

The LCBP/CVNHP Director will then circulate the letter of interest to the LCBP Steering Committee, and will work 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 public meeting rules established for the jurisdiction in which the meeting is occurring. The Executive Committee may then choose to nominate the interested organization for appointment to the Steering Committee.

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, QCMDDELCC, NYSDEC, or VTANR.
b) The Steering Committee conducts all meetings in compliance with the laws of the host jurisdiction 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,
        - 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.

c) 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.
d) No votes *in absentia* are permitted; members participating in real-time through conference call or other electronic or internet media sharing are considered present.
e) 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.
f) Meeting minutes will be posted on the LCBP website within approximately one week of approval.
g) Committee members will be asked to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* 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) Implement the Lake Champlain Basin's 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 four 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.
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 six 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 du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Sustainable

Development, 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 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.
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.

Citizens 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. 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 legislative 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 du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (Ministry of Sustainable Development, 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. US 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. The chair of the TAC 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 session.
    i. TAC will meet in closed session only when considering confidential matters limited to:
        a. review of competitive bids and awards,
        b. review of interim or final reports drafts submitted to the LCBP by a contractor.
    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 asked to review the *LCBP Conflict of Interest Guidelines for Committee Members and Peer Reviewers* 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. No attempt is made to provide stakeholder representation on HAPAC. HAPAC members serve at the discretion of the Steering Committee. 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 session.
   i. HAPAC will meet in closed 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 contractor.
   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* 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 should 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. The E&O members serve at the discretion of the Steering Committee. The chair of the E&O Committee, appointed by the Steering Committee, serves as a voting member of the Steering and Executive Committees.

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. 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 at the discretion of the Steering Committee. 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 session.
    i. E&O will meet in closed 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 contractor.
    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* to ensure close adherence to these guidelines during appropriate LCBP processes

LCBP Staff:

The LCBP is currently staffed according to the following framework (subject to change):

- LCBP and CVNHP Director
- Office Manager
- Culture, Heritage, and Recreation Coordinator, and CVNHP Assistant Director
- Education and Outreach Coordinator, Communications Coordinator, Publications and Communications Associate
    - includes other Education and Outreach staff, Resource Room staff, interns, volunteers
- Technical Coordinator, with associated staff
    - includes Technical Associate, interns
- Fish & Wildlife and Aquatic Nuisance Species Coordinator
    - includes Boat Launch Stewards, other part-time staff
- Jurisdictional Lake Champlain Coordinators for New York, Québec, and Vermont
- EPA Lake Champlain Coordinators, Regions 1 and 2

LCBP Staff Management and recruitment processes

LCBP staff are managed day-to-day by the LCBP and CVNHP Director, or other designated supervisors. All staff positions subordinate to the Director are hired via a typical competitive process coordinated by NEIWPCC, according to their standard hiring procedures, in close consultation with the LCBP/CVNHP Director and other LCBP staff as appropriate. Coordinators of the Technical, Education and Outreach, and Heritage Area advisory committees will be hired in consultation with the Chair (or their designee) of the respective committees. Coordinators of 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 Director.

The LCBP and CVNHP Director is hired via a competitive hiring process that is coordinated by NEIWPCC senior management staff. The hiring process and Position Description will be discussed in consultation with the Lake Champlain Steering Committee prior to issuance of a solicitation for applications. This process will provide opportunities for the LCBP Steering Committee to review and discuss the Position Description. NEIWPCC also will include representatives of the Steering Committee to a Hiring Committee established for the purpose of refilling the position vacancy. The Steering Committee will be responsible for the appointment of its representatives on the Hiring Committee for the position. The EPA and NPS, as the two primary funding agencies for the LCBP and CVNHP, will be included on the Hiring Committee. The LCBP and CVNHP Director reports on activities at regularly scheduled LCBP Steering and Executive Committee meetings,

and other committee meetings as appropriate. The LCBP Director is supervised by NEIWPCC senior staff based in Lowell, MA.

Appendix II: LCBP ACCOMPLISHMENTS SINCE 2010 OFA

January 2011-December 2016 LCBP Management Plan Progress: Technical Projects			
# Projects	Category	LCBP Sum Total	Sum Achievements*
27	Ag Phosphorus	$2,747,851	500+ conservation practices implemented on 300+ farms, reducing runoff from 60,000+ acres; outreach to 1,100 farmers
47	AIS Outreach	$1,078,938	130,000+ boats inspected, 320,000+ visitors reached, 11,000+ organisms removed, 24 AIS exhibits; ~85 stewards
26	AIS Prevention	$848,016	16 acres intensively treated for Asian clam, continuation of water chestnut harvesting, 14 backcountry waterbodies surveyed, NE Arm and Missisquoi surveyed, 28 tons of frogbit removed, 3,360 cubic feet of milfoil, 3,240 lbs and 700+ bags of milfoil removed, 2 non-motorized, 1 motorized boat wash stations constructed, 10,157 cormorants culled
2	Climate Change	$95,000	Outreach, technical paper on CC/Stormwater
5	Conservation	$75,928	726 acres conserved
9	Fish Passage/Native Species	$235,060	610 culverts/barriers assessed, 2 dam removals, 4 culvert replacement designs, 3 culverts replaced (11 miles of habitat opened), post-tournament bass survival analyzed, common tern population analyzed
10	Flooding	$327,884	Community outreach and economic analysis, LC flood maps produced for VT, QC and Clinton County NY, 2 new gages installed, flood resilience work
7	Habitat Assessment /Forestry	$297,882	4,805 acres assessed for erosion control; 1.5 miles of trail restored, wildlife corridors and critical habitats identified in 30 acres. 62 skidder bridges installed. Malletts Bay Littoral Zone mapped

19	Monitoring	$3,976,348	Long Term Monitoring Program, BGA Monitoring, Stream and Lake Met Gages, Load Data Analyzed, 1 habitat monitoring project
8	Research	$997,391	Critical Sources of P identified, Internal P load model, streambank P loads estimated, P adaptive management analyzed, Ag edge of field monitoring, best practices evaluated, tile drain research; Economic impact estimated; Lidar, Land use/Land Cover and Impervious Surface Area mapped
27	Riparian/Shoreline Restoration	$380,734	165+ acres restored or conserved, nearly 50,000 trees planted, 22,000+ linear feet of shoreline restored
48	Stormwater	$1,336,056	326 acres treated, 323 mile of roadside, 16,644 kg/yr TSS removed, initiated NYS BBR program and mapped Plattsburgh system, IDDE for 6 municipalities
8	Toxins	$258,748	Cyanobacteria monitoring, atmospheric mercury monitoring, fish mercury and PCB monitoring, mercury thermometer collection, and road salt
3	Wastewater	$65,550	Septic pump-outs: 88,000 gallons; 56 homes; 150 homeowners educated + Outreach and New Treatment Methods Researched
246	**Projects**	**$12,721,386**	** Achievements are summarized from closed local and large research projects, as well as two staff-driven products. Not all completed projects reported summarized data. Total costs include both closed and open projects.*

2011 -2015 LCBP Management Plan Progress- E&O			
# Projects	Category	LCBP Sum Total	Sum Achievements*
6	Invasive Species Education/ Monitoring	$37,664	Trained water and backcountry monitors to survey areas in and around the Lake Champlain Basin and the Adirondack Park. They are also stationed at multiple campgrounds, farmers markets, libraries, and other public facilities where whey share Basin and AIS information. Developed AIS exhibit at ECHO that reaches 280,000 visitors and online guests annually. Environmental Issues Educators in the tri-lakes region reached between 1800 and 4000 members of the public each season, and have the capacity to reach the 50,000 individuals who visit the Paul Smith's VIC seasonally.

3	Basin History Education	$13,574	Supported program development and implementation for Lake Champlain history and stewardship in conjunction with the purchase of an ROV at the LCMM. Funded research, development, and fabrication of historically-accurate uniforms and equipment for interpretive programming at Fort Ticonderoga, which reaches 70,000+ visitors annually. Increased the public's understanding of the War of 1812 at the local level by supporting funding to bring the Lois McClure to Rouses Point during the yearly commemoration.
7	Technical Issue Training	$42,920	Supported 15 seminars/workshops on topics such as BMPs, RAPs, Low-Impact Development, and stormwater management throughout NY and VT, with a combined 500 superintendents, DPW, town board members, DOT, and other stakeholders in the public, private, state and federal sectors in attendance.
12	Community Action/Awareness	$79,804	Completed 3000+ plantings throughout the Lake Champlain Basin to support streambank and nursery restoration programs, in addition to 5 streambank stabilization project areas. Low-impact development, bio-retention, rain garden, and invasive plant removal trainings and workshops created many additional action projects that were supported by 2000+ volunteers. Mitigated runoff from >50,000 sq. ft. of impervious surface through education, outreach, technical assistance, and incentives programs. Removed 505,000 pieces of trash along Lake Champlain, leading to STEM curriculum and awareness of microplastic and trash issue in the lake and shoreline. Developed Winooski River paddler information network, and created 2 launch sites with education components. Developed stormwater runoff education program that placed 300 storm drain markers in NY towns in the Basin, later extending to other towns in Vermont as well.
18	School Outreach Programs	$113,713	Lake George Association's Floating classroom held over 400 sessions, reaching 9148 students and adults over 64 schools and organizations. MRBA's Bugworks held 43 sessions, reaching 733 students and teachers in the MRB. 20+ programs, with 2130+ students, teachers, and adults in hand, created print and video media and participated in educational programming and activities focusing on fire tower, local history, lake ecology, stewardship, stormwater issues, and other watershed-related material.
2	Summer Youth Programs	$11,490	Wacky Water program in Essex County, NY, reached 700 K-6 youth campers with hands-on water quality education and conservation practices. The Sustainable Outdoor Leadership and Education Camp educated 60 youth to be naturalists and conservation stewards through hands-on learning.

18	Education via Media/ Commun-ications	$107,115	Developed and aired 2 PBS documentaries on AIS and local climate change education. Developed and aired 46 two-minute news segments addressing a variety of lake issues, reaching ~44,000 homes at each broadcast. Organized and developed print media for 40+ workshops, treks, and presentations on a variety of lake issues, such as AIS, stormwater runoff, climate change, stewardship and lake ecology. Created bikeway maps, interpretive guide, bilingual boating booklets, and 150+ informative signs and decals to identify, foster understanding, and expand upon human health, stormwater, and other water quality issues and recommendations. Created website and digital interpretive plan to expand visibility for product material and learning opportunities.
12	Community Development	$61,777	Researched, organized and implemented presentations and demonstrations throughout the LC Basin to foster public understanding and inspire action on a number of topics, including but not limited to: addressing stormwater runoff and BMPs, watershed ecology and overland flow of water, proper pharmaceutical disposal, lake history, local heritage, water quality issues and impacts, soil health, history of fire towers in the Adirondacks and understanding stream processes. Each program also included print and/or online information, while others also paired community learning opportunities with student curriculum development and demonstrations (watershed model, flume model, skidder bridge, stormwater mapping).
3	Teacher/Curri-culum Development	$21,000	Developed 5 instructional modules from which teachers can build single or multiple-day watershed-based programs. Supported 5 workshops, reaching 85 educators throughout NY, VT, as well as NH, to extend watershed education understanding and programming
81	Total Projects	$489,057	** Achievements are summarized from closed local projects. Not all completed projects reported summarized data. Total costs include both closed and open projects.*

LCBP In-Office Accomplishments			
	Resource Room at ECHO Leahy Center for Lake Champlain		3 LCBP staff, interns, and volunteers provided accurate, informative lake-based messaging and educational material to nearly 138,000 youth and adult visitors 360 days per year

	Online/Social Media Outreach		Redesigned LCBP website in April 2013, and regularly update and edit information to achieve 25-30K visits annually. Organize, edit, and publish LCBP's E-Newsletter quarterly. Generate multi-weekly posts to Facebook to disperse current, local information quickly to the public (10-20 likes and shares/week). Maintained and are currently redesigning the online Basin Atlas.
	Publication Development and Dissemination		Designed and develop LCBP's State of the Lake Report every 3 years, all of which is done in-house; approximately 12K copies were published in 2012 and again with the 2015 version. Designed, produced, and disseminated LCBP's Annual Report. Designed most end products such as signage, posters, rack cards, maps, etc... that deliver information to the public, as requested by all LCBP staff.
	Outreach by E&O Staff		Delivered 20+ watershed and wetland-based, hands-on programs at elementary and middle schools throughout the Basin yearly. Organized and often delivered 20+ lake-based community presentations throughout the Basin yearly, such as the Love the Lake Series and State of the Lake presentations. Delivered 20-25+ watershed and wetland-based, hands-on programs at field trip locations throughout the Basin yearly. Delivered interactive watershed-based demonstration to 300+ youth and adults at Ed Weed Fish Culture Station's Annual Free Fishing Day.

2011 -2015 LCBP Management Plan Progress- CVNHP			
# Projects	**Category**	**LCBP Sum Total**	**Sum Achievements***
5*	Cultural and Historical Research (9.1-9.2)	$28,893	Researched the Marjorie Lansing Porter music collection, analysis and artisitc representation of of the historic landscape of Lake George Village; research and restoration of a firefighting hand-pumper, development of the 2009 Lake Champlain Quadricentennial Report; site assessment of shipwreck of the *US La Vale,* research and development of a guide to Plattsburgh Oval.
	Conservation of Heritage Resources (9.3-9.5)		
7	Recreation and Accessibility to Resources (9.6-9.8)	$47,833	Interpretation of sport fishing on Lake Champlain, a longboat rowing program in Chazy; on-water mapping of Otter Creek by a youth group; three interpetive water trail grants;
21	Interpretation and Education (9.9-9.12)	$144,476	Seventeen individual grants focused on interpretation and education of cultural and natural heritage issues, the National Geographic War of 1812 Guide, Vermont Civil War conference.
8	Coordination, Communication, and Capacity Building (9.13-9.15)	$34,075	Eight grants focused on the War of 1812 and the American Civil War
3	Marketing the CVNHP (9.16-9.18)	$133,401	Tours of the Lois McClure 2012, 2013 and 2014 ($79,400 from Great Lakes Fishery Commission funds).
	Promoting Sustainability (9.19-9.23)	$0	
39	**Total Projects**	**$388,678**	**Most CVNHP projects cross several OFA categories, but the classification here identifies the most-significant focus of each project. Achievements are summarized from projects accomplished between August 20, 2011 and September 30, 2016.*

CVNHP In-Office Accomplishments			
	Wayside Exhibits		2012: 16 exhibits; 2013: 19; 2014: 12; 2015: 15
	Publications		CVNHP Orientation Guide, Champlain Valley Wine Trail rack card, 2015 Passport Stamp Card, 2016 Centenniail Passport Stamp Card; Western New England Greenway maps; Web-driven Lake Champlain Bikeway maps;
	Interpretation		Kamp Kill Kare, Exhbits in Gordon-Center House, Peru Rest Area; Valcour Island Interpretive Trail; Interpreting Sustainable Agriculture in the Champlain Valley; online geology guide;
	Partnership Building		Champlain Valley Wine Trail, Vermont Civil War Sesquicentennial Commission, NYS DOT, Lake Champlain Visitor Center; Regional Stakeholder Groups, Annual International Summit 2012-2015

Appendix IV. Lake Champlain Basin Program Advisory Committee Members

Steering Committee

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Rick Lauren
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Tom Metz
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John Zurlo
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Eric Clifford
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Kerry Crowningshield (Outreach Intern)
Michaela Stickney (VT Lake Champlain Coordinator)

Appendix V. MOUs:

- NY, QC, VT MOU
- Missisquoi Bay 60/40 (VT/QC)
- Federal Partners MOU
- GLFC/USFWS/LCBP 2010
- Section 120 LCBP Authorization (2002 re-authorization)