

## Review and Relevant Studies - Malletts Bay Recreation Resource Management Plan



for  
Lake Champlain Management Conference

## PUBLICATION SERIES

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This demonstration report is the sixth in a series of reports prepared under the Lake Champlain Basin Program. Those in print are listed below.

#### Lake Champlain Basin Program Demonstration Reports

1. *Case Study of the Town of Champlain.* Yellow Wood Associates. October 1993.
2. *(A) Demonstration of Local Economic/Other Community Impacts.* Community Case Studies for Economic Plan Elements. The City of Vergennes, Vermont. Economic and Financial Consulting Associates, Inc. October 1993.  
*(B) Demonstration of Local Economic/Other Community Impacts.* Community Case Studies for Economic Plan Elements. Appendix. The City of Vergennes, Vermont. Economic and Financial Consulting Associates, Inc. October 1993.
3. *The Archeology on the Farm Project.* Improving Cultural Resource Protection on Agricultural Lands: A Vermont Example. Jack Rossen. May 1994.
4. *(A) The 1992 Fort Ticonderoga-Mount Independence Submerged Cultural Resource Survey. Executive Summary.* Arthur Cohn. May 1995.  
*(B) The 1992 Fort Ticonderoga-Mount Independence Submerged Cultural Resource Survey.* Arthur Cohn. May 1995.
5. *Implementation, Demonstration, and Evaluation of BMPs for Water Quality: Application Methods ("Manure Injections") for Improved Management of Manure Nutrients.* Bill Jokela, Sid Bosworth and Don Meals. September 1995.
6. *(A) Malletts Bay Recreation Resource Management Plan.* T.J. Boyle and Associates, Resource Systems Group, Associates in Rural Development and Engineering Ventures. October 1995.  
*(B) Malletts Bay Recreation Resource Management Plan. Executive Summary.* T.J. Boyle and Associates. October 1995.  
*(C) Review and Relevant Studies. Malletts Bay Recreation Resource Management Plan.* T.J. Boyle and Associates. October 1995.  
*(D) Natural and Built Resources Inventory: Data Documentation. Malletts Bay Recreation Resource Management Plan.* Associates in Rural Development. October 1995.  
*(E) Survey Implementation and Analysis. Malletts Bay Recreation Resource Management Plan.* Resource Systems Group. October 1995.  
*(F) Institutional Review and Analysis. Malletts Bay Recreation Resource Management Plan.* Engineering Ventures. October 1995.

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## Review of Relevant Studies

### Vermont State Recreation Plans and Studies

**Lindsay, J. J. and Rupe, L., (1979), *Vermont Boating Study, Statistical Report*. Burlington, VT: University of Vermont, School of Natural Resources.**

The objective of this study was to **describe the sport of boating in Vermont, identify use conflicts** between the boating groups and explore **management strategies** that may address the conflicts. Boat owners were surveyed for information of their demographics, level of experience and boating habits including a description of boating activity and the location. Boat registrations showed that boating had grown slowly from 1967 to 1977. A majority of boaters had over 11 years of experience, but only one quarter had any formal training. Nearly half of the respondents indicated they used Lake Champlain more than any other with 87% of Chittenden County respondents identifying this preference. Most felt access to lakes and ponds was sufficient but in need of improvement. Lake Champlain was cited most frequently as needing more access.

Over one quarter of the respondents experienced a **boating conflict** during the season. Most conflicts involved two different use types using the same area including boaters and water skiers, motorboaters and other motorboaters; sailboaters and motorboaters, and fisherman and motorboaters. **Crowding** was considered an issue for nearly one-third of the weekend boaters.

When asked about willingness to have **certain restrictions** imposed, respondents were supportive with 84% agreeing to a limit on boating where wildlife or water quality were threatened, 88% supporting restrictions on speed, 75% willing to accept water surface zoning, and 70% supporting the restriction of water activities to certain times of the day. Very few (9%) felt commercial moorings should be allowed to extend beyond the property shore frontage.

#### **Recommendations of the 1979 Vermont Boating Study included:**

1. Drafting of **recreation utilization plans** for the heavily used water bodies with an emphasis on surface use zoning and monitoring to determine an appropriate implementation date.
2. Development of **specific plans** for commercial and other private **mooring facilities**, recognizing the service rendered but giving limits to the surface use of public water.
3. Establishment of **boat parks** on larger lakes, such as Lake Champlain, offering recreation destinations and facilities.
4. Improvements in the design and maintenance of most **boat accesses**, and the development of new accesses.
5. Developing and improving **education programs** for small boat operators to address boat handling, courtesy, safety, and conservation information.
6. Clarification of management **jurisdiction** and the delivery of a comprehensive **water recreation resource management program**.

**Lindsay John; Gilbert, Albert; Lapping, M. and Manning, Robert, (1982),  
*Allocation and Management of Vermont Lakes for Outdoor Recreation.*  
University of Vermont, School of Natural Resources. Report for the  
Agency of Environment Conservation.**

This study focused on developing management and planning recommendations for water-based recreation activities and facilities on Malletts Bay, Shelburne Bay and Burlington Waterfront of Lake Champlain and Waterbury Reservoir and their immediate shorelines. Boating patterns were established through the use of aerial photography. Surveys of boaters, shoreline residents and marina operators were conducted to identify attitudes and perceptions toward selected lake management issues and management strategies. Review of relevant legal and judicial documents and selected management plans identified management alternatives and opportunities.

Sailing was found to be the most popular activity in the study area followed by "on board anchored", fishing, and "boat beached on shore". **Malletts Bay boaters were pretty evenly divided in their means of accessing the water: 37% utilized marina moorings, 30% trailered their boats, and 33% moored or beached their boats in front of private lakeshore property.**

Overall, the boater respondents were satisfied with their boating experience on Lake Champlain. The responses were fairly divided on the need for additional moorings. Almost all respondents expressed the need for strict environmental regulations on new marinas. Forty six percent of the respondents noted that more public access was needed.

Most shoreline properties were camps with Malletts Bay being more densely populated with individual shoreline properties than Shelburne Bay. Most property owners moored only one boat with nearly half of those being motorboats. Shoreline residents were divided on their opinion as to the extension of property rights out into the Lake, **while a majority (70%) of the respondents felt that mooring of public boats should be restricted to at least 300 feet from a private shoreline.** Most residents feel that moorings should be limited to the area in front of each property by projecting the boundary lines and the number of boat moorings should be determined by the length of shoreline property owned. In general, shoreline residents were moderately to minimally concerned with the level of crowding, boaters' behavior, and noise level.

Marinas supply over one thousand berths in the study area with moorings comprising half of the berths, followed by 36% slips and 11% docks. Marina operators do not feel boating safety is a problem, however nearly half agreed that boating safety and enforcement patrols should be initiated.

Recreational boating patterns were identified through aerial photographs showing changing trends through the day, and a tendency for different patterns and use areas associated with different boating activities.

**Based upon the data collection the following issues were identified:**

1. More and better access is needed to Lake Champlain with intent to help distribute boats more evenly.
2. Additional marina berthing is needed on Lake Champlain, however only with strict regulations on environmental impacts.
4. Though boating density is relatively high near marina facilities, few respondents felt it was presently a problem.
5. Conflicts between shoreline residents and boaters was viewed by residents as generally



satisfactory.

A review of federal and state regulations and management plans was conducted to extract a range of management alternatives. The study contains a comprehensive description of management strategies including: traffic rules, speed rules, activity restrictions, recreational carrying capacity, surface water zoning, and shoreland controls. Boaters, shoreline residents, and marina operators were surveyed for their attitudes on various management strategies.

**Based upon the review and survey the following key conclusions were drawn:**

1. A comprehensive approach to **lake recreation management** is needed.
2. Local jurisdictions should play an appropriate role in the management process.
3. **Lake and shoreline management** needs to be coordinated.
4. Important steps have been taken in Vermont for lake management including the establishment of the **Water Resource Board** and the **Vermont Shoreland Zoning Act**.
5. Lake management requires **enforcement** to be effective, yet there is a reluctance to pay higher registration fees for more intensive boating management on Lake Champlain.
6. Boaters favor **education, increased enforcement, and speed limits** in certain areas over surface use zoning, limits on boats numbers and horsepower, minimum age or requiring operator licensing.
7. Reasonable limits should be placed on **private moorings** with 5 or more moorings subject to regulations.

**Recommendations of the study are as follows:**

1. An effective **information/education program** should be developed to include:
  - a. Boat safety booklets.
  - b. Informational bulletin boats.
  - c. Expansion of "courtesy patrols" by the Coast Guard Auxiliary and/or the U. S. Power Squadron.
  - d. Emphasis on encouraging boat operators to attend a **boating safety course**, particularly young boaters.
  - e. Encourage appropriate behavior in the "near shore" area.
  - f. Keep open communications with shoreline residents regarding rights and responsibilities.
2. Department of Public Safety should ask a series of questions on boating activities as part of registration.
3. The State's **Shoreland Zoning Act** should be revitalized to protect intensively used areas from shoreline development.
4. All marinas that service boats with on-board sanitary facilities should be required to have **pump-out facilities**.
5. Additional **boat accesses** should be provided on Lake Champlain including:
  - a. General boat access,
  - b. Launching/day user areas,
  - c. "Boat parks" with extensive facilities.
6. Each area of the lake should have **specific regulations on moorings**:
  - a. **Commercial moorings** - addressing environmental impacts, adequacy of parking, pump-out facilities, traffic channels, and impacts on neighbors.
  - b. **Private moorings** - regulations for owners with 5 or more moorings, and limited to an area between extensions of property lines.
7. State should retain central responsibility for management policy. **Water Resources Board** is the appropriate agency.
8. All boats be **registered**, part of registration fee goes to access.
9. Additional **marina facilities** should be developed or expanded but carefully regulated for environmental impacts and recreation use impacts.
10. Clear definition of **public's right to use the State's waters**.

**Vermont Department of Forests, Parks, and Recreation, (1988), *Vermont Recreation Plan, Lakes and Ponds Task Group Report*; Vermont Agency of Natural Resources, Waterbury, Vermont.**

The Lakes and Ponds Task Group was established to review issues, identify goals, and recommend action for improving the recreation experiences on Vermont lakes and ponds. The group established four principles to guide maintenance and development of recreation opportunities:

- to foster and preserve a **diversity in both ecological systems and recreational opportunities.**
- to foster and preserve **environmental quality.**
- to recognize that a **carrying capacity** may be imposed in recreational resources by both environmental limits and limits of desired quality of recreational experience.
- to provide for **effective resolution of problems and conflicts** between competing recreational values and uses in a fair and equitable manner.

The Lakes and Ponds Task Group identified six issues with related goals and actions stating each issue as equally important: water quality, aesthetics, boating, public access, wilderness ponds, and fish and wildlife resources.

**Issue A: Water Quality**

High water quality is essential for quality recreation opportunity. Phosphorous, aquatic nuisance plants, and shoreland development pressure threatens water quality levels.

Goal: To improve the water quality of Vermont's lakes and ponds by developing and encouraging means to decrease point and non-point pollution sources.

**Actions recommended to address water quality include:**

- **Lake protection legislation.**
- **Cooperative agreements** between New York, Vermont and Quebec regarding Lake Champlain water quality.
- Accelerating existing **non-point pollution control programs** of the Soil Conservation Service.
- Department of Environmental Conservation (DEC) should include **lakes as a priority** in the mandated update of the **non-point pollution control program.**
- **Lake Champlain Nutrient Management Program** should address cumulative impacts.
- DEC should require **construction sites near shorelines** to adhere to **erosion control** through legislation.
- DEC should encourage towns and regional planning commissions to participate in **On-Site Sewage Programs.**
- There should be a position in DEC with state funding to develop **guidelines for lakeshore zoning.** (a position has been created)
- Continue the **Aquatic Nuisance Control Program.**

**Issue B: Aesthetics**

Lakeshore aesthetics are threatened by development pressure. Towns are not required to adopt shoreland zoning. **Excessive shoreline development is apparent along Malletts Bay on Lake Champlain.**

Goal: To protect shorelands from overdevelopment by encouraging shoreland zoning and through strengthening public education efforts.

**Recommended actions to address shoreland aesthetics:**

- DEC provide technical assistance to towns regarding shoreland zoning.
- On-Site Sewage Program should serve as a model for shoreland zoning assistance.
- There should be active protection of shorelands through purchase of land, easements, and development rights.
- Aesthetic shoreland standards should be developed for Act 250 and Act 200 by the Agency of Natural Resources.

**Issue C: Boating**

Recreational boating has increased significantly threatening safety, health, and the quality of the recreation experience.

Goal: To provide healthier and safer environments on Vermont's lakes and ponds for boating and recreation.

**The following are key actions that were recommended to address the boating issue:**

- The Agency of Natural Resources should implement a state policy regarding future marina development on Lake Champlain and other lakes and should consider recreational carrying capacity.
- A boaters safety course should be required to obtain an operators license. The license should be endorsed on the automobile driver's license implemented by the Motor Vehicle Department.
- The Agency of Natural Resources should conduct a study of the cumulative impacts of previously issued surface water regulations in Vermont, suggesting a range of standards for future regulations.
- Increased enforcement needed, reflecting increased boating activity.
- Marine Division of the Department of Public Safety should consider delegating authority to local enforcement authorities to enforce boating laws on small lakes and ponds.
- State legislature should authorize a study on the statutes and limitations of the State's many boating laws and regulations including recommendations for revisions.
- Children under 16 years old should not be allowed to operate a powered boat without a licensed operator aboard.

**Issue D: Public Access**

Existing access sites are insufficient for the increased population and level of boating activity. Many of the accesses were initially developed for fishing access without facilities for a larger recreating public.

Goal: To improve public access and facilities at lakes and ponds in Vermont for boating, swimming, and automobile parking while land is still available.

**Key recommended actions addressing boat accesses include:**

- The Department of Forests, Parks, and Recreation should determine surface water access needs for recreation.
- The Departments of Fish and Wildlife and Forests, Parks, and Recreation should conduct a joint study to determine the feasibility of utilizing fishing accesses for recreation accesses and other appropriate water recreation activities.
- Swimming access areas should be acquired where needed.
- Land acquisition and facilities development funds should be made available through a dedicated trust fund of motorboat registration and license fees.
- Improved toilet and trash facilities should be provided at fishing and boating access areas.
- Public access sites should be more visible.
- Public information about access sites should be provided through many avenues including

town offices, private businesses, and sent with boat registrations.

#### **Issue E: Wilderness Ponds**

Not directly relevant to the Malletts Bay Recreation Management Plan.

#### **Issue F: Fish and Wildlife Resources**

Habitats are being threatened by increased development and overuse of lakes and ponds. Of particular concern are loon habitats relative to lake levels, and the control of sea lamprey.

#### **Key recommended actions for protecting Fish and Wildlife Resources include:**

- DEC should address the **cumulative impact of shoreline development** for affects on fish and wildlife habitat.
- DEC and Act 250 should **expand enforcement**.
- **Critical habitats** should be signed and identified in **pamphlets**.
- **Landowners programs** to enhance fish and wildlife management should be expanded, particularly in areas of critical habitat.
- **Small lake and pond level rules** should be reviewed periodically to ensure protection of **loon nesting sites and fish spawning areas**.
- Fishing programs should be expanded to ensure **supply and quality of stocked fish matches fisheries' management objectives**.
- **The Lamprey Control Program** on Lake Champlain should be implemented. (has been)
- **Public education** on fish and wildlife resources should be implemented.
- **Public and commercial television** should be used to promote awareness of fish and wildlife protection.

**Clavelle, Peter, Chair, Lori Fisher, William Facobus, Dr. Gould Susslin and Robert Woodard, (1989), *Harbors, Marinas, and Mooring Report*, Montpelier, VT: Legislative Boating Committee, Harbors, Marinas, and Moorings Subcommittee.**

The Harbors, Marinas, and Mooring Subcommittee was named by a Special Legislative Boating Committee to identify **issues** and offer **recommendations**. Through a process of three public hearings and solicited written testimonies, the following issues were identified: the lack of comprehensive planning for the State's lakes and ponds, minimal regulations of moorings and marinas, and the lack of resources and expertise for Towns to regulate moorings. **In reponse to these issues the subcommittee made the following recommendations:**

1. **Permits** should be required for all **moorings** located in a mooring management zone and any installation of three or more moorings. The Department of Fish and Wildlife should **designate shoreline fishing areas** and moorings should be prohibited in those areas prior to May 15.
2. **Capacity studies** of Vermont lakes should be conducted immediately. Vermont, New York, and Quebec should jointly conduct a "capacity study for Lake Champlain.
3. Rules should be considered: too **restrict moorings** to within 500 feet of the shoreline; protect environmentally sensitive areas from mooring and anchoring; and create "no wake zones" in designated mooring areas.
4. Develop specific criteria, guidelines, policies and goals for the development of **marinas** in public water bodies.
5. Act 250-like criteria should be adopted for **marina development** and a State plan identifying appropriate areas for marinas based upon the carrying capacity studies. Vermont and New York should develop uniform policies to guide marina development on

- Lake Champlain in efforts to protect water quality and other uses.
6. **A Water Resources Management Fund** should be established receiving revenue generated by boat registration fees, sales tax on boat and marine accessory sales, license fees on moorings and lifts, boat trailer registration fees, and gasoline tax. The funds should be used for enforcement, education, capacity studies, development of boater facilities, and water quality/environmental conservation.
  7. The State should assume a more active role in the development of and upgrading of **boating facilities** including pump-outs, transient moorings and slips, boat access areas, and affordable public marinas. Improvements include: upgrade ramps, sanitary facilities, area lights, sufficient parking, and attendants for busy periods.
  8. Laws regulating **pollution** of Vermont lakes and ponds should require severe penalties and be vigorously enforced.
  9. **State Departments' roles and responsibilities** regarding boating should be clarified.
  10. **All boats** using the waters 30 days or more should be required to be **registered on a progressive fee schedule** determined by size of boat and/or power, including canoes and kayaks.
  11. Residential uses of boats on lakes and ponds without approved boat sanitary waste **pump-out facilities** should be prohibited.

**Specific Lake Champlain Recommendations:**

12. A study of the **water quality impacts of marinas** should be conducted and address: sewage contamination, accumulation of toxic materials, gas and oil pollution, greywater impacts, turbidity, and shoreline erosion.
13. Enforcement of the **holding tank laws** should continue to be enforced.
14. Existing regulation for **gray water discharges** from boats need to be enforced.
15. Boat paints containing **tributyl tin (TBT)** should be banned. An enforcement policy developed.

**Zwick Associates, Inc., Voske, Donnelly and Associates, and Baystate Environmental Consultants, Inc., (1990), *Vermont Lakes and Ponds Recreation Management Study: Draft, Waterbury VT: for Vermont Agency of Natural Resources, Department of Forests, Parks and Recreation.***

This study explored the statutes of Vermont management of lakes and ponds, identified the constraints in providing water-based recreation opportunities, and developed a program of management strategies. The program includes guidelines for assessing visitor impacts and provides recommendations for implementing management and protective strategies.

The report contains a fairly comprehensive review of federal and state programs and legislation affecting Vermont's lakes and ponds and a review of past Vermont lakes and ponds recreation management studies.

Trends and issues occurring on Vermont's lakes and ponds were established through a three tier approach. 1) Nominal group meeting, 2) Delphi survey, and 3) Manager interviews. First there was a nominal group meeting of lake management officials, resource managers, lake association members, political/planning officials, water-related recreation activity groups, private landowners, and a marina operator. This group developed a list of the most relevant lake management issues and concerns which were used in the Delphi survey process.

The **nominal group** identified eight issues impacting Vermont's lakes and ponds:

1. **Water quality and ecological impacts**, specifically milfoil spread, polluted run-off, and aquatic weed growth.

2. **Development** around lakes and ponds.
3. The amount and types of **recreation uses**.
4. **Conflicts** between recreation user groups.
5. **Accessibility** for swimming and boating.
6. **Responsibilities** of Vermont lake's managers.
7. Adequacy of current **regulations and management practices** and
8. The need to **classify lakes** based on use and water quality.

The Delphi surveys were conducted through a series of three rounds of questionnaires administered to a select panel of individuals in attempts to synthesize the views of diverse interest groups and agencies.

The **Delphi process** identified the following priority of issues and implementations:

1. **Milfoil** spread between lakes, **developments** around lakes and ponds, pollutions, and excessive weed growth were the most frequently cited problems.
2. Only ten percent of respondents felt the identified issues were being addressed by **management authorities**.
3. **Physical impacts** (milfoil spread, lakeshore development, pollution run-off, and excessive weed growth) will continue to be a problem in the future.
4. Most respondents felt there should be more **enforcement** of boating regulations and water pollution regulations and less than ten percent felt there should be fewer regulations.

The concerns identified in the Delphi survey were utilized in the Manager Interviews where a select group of Vermont lakes and ponds managers were asked for their perspective on the current status of management practices.

**The manager interviews identified the following issues:**

1. Managers perceived an **overlap of responsibilities** in monitoring and protection of water quality.
2. **More effective communications** needed between managers.
3. A lack of **implementable management plans**.
4. A lack of **funding**, sufficient manpower, enforceable laws and judicial support, and consistent shoreland protection mechanism makes for ineffective enforcement.
5. Insufficient numbers and distribution of boating and swimming **access sites** were perceived as major inadequacies in management planning.
6. **User conflicts**, particularly involving motorized use, was cited most frequently.
7. Concern for the lack of a comprehensive **inventory of lake and pond resources and recreation opportunities**.

The report reviews existing research related to **carrying capacity**. A definition reflecting current thinking suggests carrying capacity is *the level or type of use beyond which impacts to the environment or visitor experiences exceed acceptable levels*. Carrying capacity estimation process requires two separate parts: 1) **description of the relationship** between types and amount of use and their impacts and 2) an **evaluation of the acceptability** of the various impacts.

The **descriptive component of carrying capacity** explores the interrelationships between ecological and social impacts. Ecological impacts include water quality, shoreline vegetation and soils, and fish and wildlife. Social impacts involve visitor satisfaction, perceived crowding, perceptions of conflict, recreational boating safety, and perceptions of the natural environment.

The **evaluative component of carrying capacity** involves developing standards for acceptable levels of impact, and comparing existing conditions to see if they exceed the standards. For example, lake user surveys conducted at the same time as lake eutrophication monitoring can be

used to establish acceptable water quality standards. Studies to establish acceptable standards for social impacts have explored boating space requirements, perceived crowding and normative evaluations. Boating space standards from various sources vary significantly suggesting little potential for universal acceptance of the guidelines. Perceptions of crowding, according to the report, offer greater potential as a capacity indicator. Normative evaluation involve identifying user's expectations as the ideal against which the conditions should be evaluated. This report states normative evaluations provide the greatest potential for incorporating user perceptions or judgments into both social and ecological capacity decisions.

**Visitor Impact Management (VIM)** is a relatively new process for assessing visitor impacts of a resource and recreation experience. The process involves eight steps which this study suggests should be conducted separately for each Vermont lake and pond.

The eight steps are:

1. **Pre-assessment Data Base Review.** A review of legislature, policy, past studies, and data base information of the physical and cultural resources.
2. **Review of Management Objectives.** Review of existing objectives compared with legislative mandate and policy and an identification of visitor experience; then specifying resource management objectives e.g. *maintain natural vegetation in riparian zones*.
3. **Selection of Key Impact Indicators.** Develop a list of measurable social and ecological indicators pertinent to the management objectives. e. g. *loss of vegetation/% of ground cover*.

The study elaborates this step to include a lake and pond classification scheme to help managers determine appropriate objectives. It identifies four categories of lakes and ponds:

- Wilderness
  - Non-Motorized
  - Low Speed Motorized Use and Compatible Non-Motorized Recreation
  - High Speed Motorized and Compatible Low Speed/Non-motorized Recreation
4. **Selection of Standards for Key Impact Indicators.** Prepare quantitative measurements of preferred conditions, e.g. *no more than 30% vegetation loss at a specified site*. Tables included in the study present examples of standards which can be set for different allowable impact levels.
  5. **Comparison of Standards and Existing Conditions.** Through field assessment, determine the consistency of the selected social and ecological indicators, through a monitoring process.
  6. **Identify Probable Causes of Impacts.** Examine and describe the potential factors affecting the unacceptable impacts requiring management attention.
  7. **Identify Management Strategies.** Examine the potential management strategies which could address the causes of visitor impacts and create a matrix of alternative management strategies to evaluate consistency with management objectives, difficulty to implement, probability of achieving desired results, effects on visitor freedom, and effect on other impact indicators.
  8. **Implementation.** Management programs must be flexible to respond to changing conditions. The study recommends a prioritization process and continuous monitoring.

In summary, the study suggests the Visitor Impact Management (VIM) process could be used by the Water Resource Board as a means for determining impacts, identifying resources most in need of protection and management and prioritizing the management action.

**Bulmer, Susan K., (1993), *Vermont Recreation Plan: Assessment and Policy*, Waterbury, VT: Agency of Natural Resources, Department of Forests, Parks, and Recreation, Parks and Recreation Division.**

Every five years states are expected to prepare a needs assessment and policy plan as part of the prerequisites for grants from the Land and Water Conservation Fund. The plan outlines the issues, alternatives, recommendations and policies resulting from the state's outdoor recreation planning process. Of particular relevancy to the Malletts Bay Recreation Management Plan is the special study, Vermont Lakes and Ponds Recreation Management Program. The results and recommendations of the Vermont Lakes and Ponds Recreation Management Study are addressed in three categories: Lake Typology, Visitor Impact Management, and Issues and Trends Affecting Lakes and Ponds. For elaboration, see the review of the *Vermont Lakes and Ponds Recreation Management Study*.

Other Special Studies having further bearing on the Malletts Bay Recreation Management Plan are:

- Vermont Trails and Greenways Plan. The **Lake Champlain Bikeway** is listed as a potential regional trail network.
- Vermont Land Acquisition Survey Report lists securing improved **public access to the Lake Champlain shore** as one of the highest priority areas for state land acquisition.

In the chapter addressing local and regional recreational issues and needs, concern for the **water quality** of Lake Champlain is listed as a pressing issue within the area of the Chittenden County Regional Planning Commission.

The first **Lake and River Shoreland Conservation Conference** was held during the summer of 1993 which **identified the following seven recommendations for action:**

1. Government, academic and private interests should work together by: summarizing **best management practices** for shoreland protection and restorations, developing guidelines for appropriate application and developing a **model shoreland management plan**.
2. **Educate on shoreland values and protection** by: helping teachers incorporate interesting concepts into their curricula, developing educational sheets for dissemination and providing educational tools on shoreland conservation to land trusts and leaders of other outdoor activities, increasing public awareness on the issue that sediments are pollutants, create a slide show or video and speaking at civic organization meeting.
3. **Provide technical assistance** and training to groups working with landowners regarding legal options for protecting shorelands; developing fact-sheets on technical measures of shoreland protection and restoration practices.
4. **Hold events highlighting shoreland issues** to provide public education and recognition for shoreland conservation efforts and publicity demonstration projects in differing land use conditions.
5. Integrate **shoreland and water quality protection in transportation planning, engineering and maintenance** at municipal and state levels.
6. Enhance public policies, management practices, enforcement and research on Vermont shorelines through adoption, implementation and enforcement of **best management practices** for agriculture, silvaculture, stormwater management, and all publicly owned land. Legislate a **surface water classification system** that recognizes shorelands as part of the ecosystems.
7. Create **financial incentives** and provide **public funding** including public assistance for specified best management practices, tourism and marketing strategies to promote products



and developments that protect shorelands, a tax structure, and user fees.

A 1992 statewide recreation survey was conducted to assess Vermonter's opinions on the quality of recreational and environmental resources and their perceptions of the importance of specific recreational and environmental issues. Half the respondents indicated that **nuisance aquatic plants (56.9%), the destruction of habitat for fish (51.8%), and shoreline development (48.4%)** were the main "big" problems, with 38.4% stating there were not too many boats on lakes and ponds.

The 1993 Vermont Recreation Plan addresses **Lake Champlain** separately as an area of special concern. The major issues and recommended actions are as follows:

1. **Nonpoint Source Pollution and Water Quality** - nutrients, sediments, pathogens, toxic contamination and related water quality concerns. The main nutrient pollutant of Lake Champlain is phosphorous fostering algae blooms and more rapid eutrophication. High sediment levels reflect erosion rates leading to disruptions in aquatic life, impaired spawning and nursery conditions, stressed invertebrates and reduced light penetration. Sediment also clogs navigation channels, fills lakes and reservoirs and increases water treatment costs. Pathogenic substances, such as giardia, cryptosporidium, and fecal coliform, enter the lake through combined sewer overflows, and runoff from ground spreading septages, sludge and manure. Isolated incidents of high levels of fecal coliform have led to closing of beaches in Burlington, Colchester and South Burlington. Potential threats to public health arise from drinking tainted water, eating fish with accumulated toxic substances, and bodily contact with bacteria, viruses and parasites. **Key recommended actions for reducing non-point source pollution include:**
  - a. Establish **uniform water quality standards** between Vermont, New York and Quebec.
  - b. Develop **phosphorous reduction strategies** for priority sub-basins.
  - c. Encourage local **watershed protection initiatives** to achieve phosphorous target levels.
  - d. Implement the comprehensive **Agricultural Monitoring and Evaluation Network**.
  - e. Expand and accelerate implementation of existing **USDA** and other non-regulatory programs.
  - f. Upgrade **State water control programs**.
  - g. Encourage implementation of **best management practices (BMP's)** for road construction and maintenance.
  - h. Separate and provide treatment for combined **sewer discharge**.
  - i. Continue implementation of state management practices for **forestry**.
  - j. Encourage cooperative development of **shoreland restoration** and protection tools.
  - k. **Research and monitoring** of benefits of management programs.
  - l. Develop coordinated **fish sampling and consumption advisory programs**.
  - m. Initiate a strong **public education** effort on pathogenic contaminants for swimming at non-public beaches.

Toxic substances believed to be damaging to Lake Champlain's water quality include mercury, zinc, PCBs, pesticides and PAH's, among others. **Key recommended actions for toxic substances include:**

- a. Consider and develop alternative **low-cost reduction alternatives**.
- b. Improve local **hazardous waste collection programs** and educate about alternative products.
- c. Improve regulation, inspection, and maintenance of **on-site sewage disposal**.
- d. Develop cost-shore or tax rebate incentive programs for encouraging the use of **vegetative buffer strip**.

2. **Living Resources - Fish and Wildlife, Wetlands, Nuisance Aquatic Plants and Animals.**

**Fish and Wildlife** resources in the basin are threatened by loss of habitat from development, certain agricultural practices, pollution and the invasion of exotic species. **Key recommended actions include:**

- a. Using **indicator species** to monitor ecosystem health.
- b. Coordinate existing **endangered species strategies**.
- c. Work with landowners to enhance **critical habitats**.
- d. Monitor effects of substances on **fish and wildlife**.
- e. Educate on **ecosystem management** and roles of various agencies.

**Wetlands** are threatened most directly by development pressure. **Key recommended actions include:**

- a. Coordinate **wetlands regulations** at all levels of government.
- b. Establish a **mitigation banking system**
- c. Continue **funding** for the Lake Champlain Wetlands Acquisition Strategies.
- d. Provide **financial incentives and technical assistance** for landowners to protect wetlands.

**Nuisance Aquatic Plants and Animals** pose serious threats to fish and wildlife, recreation enjoyment and underwater structures. Nuisance species of Lake Champlain include the sea lamprey which has almost decimated the salmon population, purple loosestrife, water chestnuts, Eurasian milfoil, white perch, European rudd, gizzard shad, and zebra mussels.

**Key recommended actions include:**

- a. Continue and develop **monitoring programs** of the nuisance species and include an early warning system.
- b. Develop a **comprehensive management program** for each species, including and implementing appropriate technologies.
- c. **Educate the public.**

#### **Human Component - Recreation, Cultural Heritage, Land Use and Economics.**

**Recreational use** of Lake Champlain has increased threatening the quality of recreational experiences and the basin's natural, cultural and historic resources. Limited public access, congestion, conflicting uses, and unsafe boating practices have had negative impacts. **Key recommended actions include:**

- a. Develop an **access plan** involving partnerships, a dedicated trust funding and an adopt-an-access program.
- b. Develop **recreation management plans** for high use bays.
- c. **Coordinate boating laws** between Vermont, New York and Quebec.
- d. Implement measures for **boating education**, mandating a boating operator license to require mandatory boating safety courses.
- e. **Identify areas** for special anchorages, future moorings and marina expansions, public access, navigational hazards, channels, and fairways.
- f. Actively promote and develop appropriate **guidelines for managing tourism.**

**Cultural Resources** are rich in the Lake Champlain Basin, but are threatened by natural deterioration, development, vandalism, overuse, lack of management and financial support.

**Key recommended actions include:**

- a. Develop **heritage trails**.
- b. Develop **public educational materials**.
- c. Implement a **cultural resources management plan**.
- d. Identify, designate and manage **underwater preserves**.
- e. Develop a basin-wide **marketing program**.

- f. Compile data in a region-wide **GIS data base** and develop uniform guidelines for assessment and evaluation of cultural resources for decision making.

**Land Use** in the Lake Champlain Basin has significant impacts on water quality and human use of the Lake. Outside economic factors, natural resources and the natural beauty of the basin significantly impact development patterns. **Key recommended actions include:**

- a. Support **local watershed planning** efforts.
- b. Increase **public education**.
- c. Undertake **demonstration projects**.
- d. Project development trends and investigate **cumulative impact** methodologies.
- e. Develop strategies that **enhance economic vitality** by capitalizing on the unique qualities of the basin.

The 1993 Vermont Recreation Plan recommends the following actions edited in this review for relevance to the Malletts Bay Recreation Management Plan:

#### **Actions for Lakes and Ponds**

##### **Vermont Agency of Natural Resources.**

1. Continue the **Aquatic Nuisance Control Program**.
2. Continue the **Lakes and Ponds Recreation Management Program**.
3. Require **registration of non-motorized vessels** to meet the needs of non-motorized boaters by providing additional funding for access areas, boating safety education, and necessary aquatic species control.
4. Encourage **shoreland zoning**.
5. Continue active **protection of shorelines** through purchase of land, easements, and/or development rights.
6. Investigate feasibility of starting a **grant program** under the Clean Vessel Act for development of **pump-out facilities**.
7. Conduct a special study to determine **surface water access needs**.
8. Develop **public information** on public access areas, noting those available for persons with disabilities.

##### **Vermont Department of Public Safety.**

1. Increase **enforcement personnel** to reflect increased boating activity and level of violations.
2. Explore feasibility of **mandatory boater licensing**.

##### **Vermont Legislators.**

1. **Registration required for non-motorized vessels**.
2. **Require shoreland zoning**.
3. Continually support special funds through boat registration for access, enforcement and education.

#### **Accomplishments Since the 1988 Vermont Recreation Plan.**

##### **Federal Agencies.**

- Congress passed the **Lake Champlain Special Designation Act** in 1990 which established the Management Conference and authorized \$25 million for a five year period; \$7 million had been appropriated to the program at the time of writing the 1993 Vermont Recreation Plan.
- Congress passed a bill that established a **"pilot" Partnership Program** to provide small grants to local community, non-profit organizations and citizen groups for recreation, water quality, fisheries and environmental education programs in the Connecticut River

- Basin and the Lake Champlain Basin.
- The U. S. Environmental Protection Agency has been providing **staff assistance** to the Lake Champlain Basin Program and **overseeing contracts** distributed by the Management Conference.
- U. S. Coast Guard provided a \$50,000 grant to Vermont and New York to conduct a **boating study on Lake Champlain** which was completed in 1992 by the Vermont Department of Forests, Parks and Recreation.

#### State Agencies - General

- During the 1989 legislative session H.132 was passed addressing the **revision of state boating laws, developing a boating safety education program, and dedicated funds** for aquatic nuisance plant controls, Fish and Wildlife access sites, and the Department of Public Safety, State Police Boater Safety Education Program.
- The Special Legislative Study Committee on **Harbors, Marinas, Moorings, Water Management and Access** heard public testimony and made recommendations for revisions of some laws (Summers 1989 and 1990) (See review of *Harbors, Marinas, and Moorings Report*).
- Act 265 passed in 1990 **mandating lake and pond surface use management plans** for surface waters over 20 acres in navigatable waters.
- The Special Legislative Study Committee on the **Public Trust Doctrine** drafted recommendations and introduced public trust legislation which **did not pass and has not been pursued again**.
- Vermont, New York and Quebec** resource agencies signed a **Memorandum of Understanding for Cooperative Management of Lake Champlain** (1988). In 1993 a five year extension was signed.
- Lake Champlain** was designated a **UNESCO International Biosphere Reserve**.

#### Vermont Agency of Natural Resources.

- A **Lake Champlain Project Coordinator** was hired to help integrate all ANR projects dealing with natural and recreational resource management of the lake.

#### Department of Forests, Parks, and Recreation.

- Conducted the **Lakes and Ponds Recreation Management Study** in 1989-90 as part of the 1993 Vermont Recreation Plan; developing a classification and prioritization process for Vermont's 295 lakes and ponds over 20 acres in size.
- Inventory and recreational use information was collected at 12 priority Vermont lakes and ponds to formulate a **visitor impact model to help determine carrying capacities** for each lake and pond.

#### Department of Environmental Conservation.

- The herbivorous **aquatic weevil**, *Euhrychiopsis lecontei*, was introduced at two lakes to determine the effectiveness at combating Eurasian milfoil.
- The **Lay Monitoring Program** for Vermont lakes and ponds continues to be successful in collecting water quality and aquatic nuisance plants control information.
- DEC publishes a newsletter covering lake issues titled *Out of the Blue*.
- Implementation of a **Phosphorous Management Program** and initiation of a **Water Quality Toxics Assessment Program**.

#### Water Resources Board.

- Drafted the **Statewide Use of Public Waters Policy** with extensive public involvement. (passed in Oct. 94 effective January 1, 1995, does not include Lake Champlain.)
- DEC publishes a newsletter covering lake issues titled *Out of the Blue*.

- Vermont Water Quality Standards were revised based on 14 years of data collection through the Lay Monitoring Program (1991).
- Private and Non-Profit Organizations.**
- The Lake Champlain Committee published the *Planning Guide for Lake Champlain Towns*.

**Bulmer, Susan K., and Virginia Garrison, (1994), *Statewide Lakes and Ponds Recreation Management in Vermont*, Lake Line, North American Lake Management Society, V. 1.14, No. 2, June 1994, p. 29-31.**

In 1989 the *Vermont Lakes and Ponds Recreation Management Study* identified issues, trends and needs of Vermont water-based recreation, and **proposed a lake classification or typology scheme** based upon the recreational experience of the lake. Spurred by numerous individual petitions in recent years for recreation restriction on certain lakes, the Water Resources Board and Agency of Natural Resources formed a task force to develop management recommendations for the lake types suggested in the *Lakes and Ponds Recreation Management Study*. Utilizing existing knowledge of staff, lake association members, state police officers and game wardens, each lake and pond was characterized by its existing use into a **three level typology scheme**:

- high speed boating (greater than 5 mph)
- low speed boating (less than or equal to 5 mph)
- non motorized boating

A distinct pattern was found that **few lakes smaller than 75 acres were used for high speed boating**. Additionally, through various studies the Water Resource Board determined that **30 contiguous acres were needed for safe, high speed boating**. Current Vermont regulations require a **200 foot wide no-wake or 5 mph zone** from all shoreline including islands. From this information the Water Resource Board proposed statewide regulations, the **Use of Public Waters**, which essentially freezes in time the current uses of Vermont lakes and ponds. After extensive public involvement, the Use of Public Water Policies were formally initiated into rulemaking. The public response was charged and angry, potentially in response to misinformation and confusion with a concurrent citizen's petition called "Quiet Lakes". The public outcry and ensuing battle between "quiet users" and "speed boaters" brought the regulating process to a halt with the Water Resource Board evaluating appropriate next steps. (The Statewide Use of Public Waters Policy was passed in October, 1994, effective January 1, 1995.)

## Lake Champlain Studies

**Lowenstein, Frank and Sheryl Lechner, (1990), *State of the Lake: A Lake Champlain Advisory*; Lake Champlain Committee, Burlington, VT.**

This report identified the threats to the Lake Champlain Basin and suggested actions that individuals, communities, state, federal and provincial government and the Lake Champlain Committee can do. Lakes Values and Issues Survey was conducted by contacting local officials in every city, town and village along the lakeshore during the summer of 1989 as the basis for the report.

### **Threats to the Lake Champlain Basin:**

In 1989 the Malletts Bay beach was periodically closed due to **high coliform counts** from human waste. Meanwhile, 1600 moored and docked boats competed with 300 boats accessing

through a boat access designed for 175 leading to crowding and congestion. The most pressing threats were "declining water quality, diminishing recreational opportunities, and short-sighted land use". To avoid crisis, **three problems need to be addressed:**

1. **A lack of information for decision making.** This includes the extent of bacterial pollution, types and amounts of toxic compounds in the water, sediments, and fish, and base information on recreation use. For example, in Malletts Bay the amount and origin of the bacterial pollution is not clear; possibly from illegal dumping of boat holding tanks, leaking septic systems, or farm practices up the Lamoille River.
2. **A lack of coordination between government.** There are 225 federal, state, county, and town governments in two states and a Canadian province. Management goals should be keyed to the health of the ecosystem then translated to specific goals for particular places. In Malletts Bay, for example, a goal may be to eliminate low oxygen levels at the bottom of the bay which harm fish and aquatic life.
3. **Take an integrated basin-wide perspective in dealing with the issues.** The Basin is an area the size of Massachusetts over 8000 square miles. An integrated approach would set goals and then require consideration of all the factors standing in the way of achieving the goal. For example the bacterial-pollution problem in Malletts Bay: this could mean examining the impact of growing recreational use, condition of the septic systems, and conversion of cottages to year round use.

High **water quality** is a basic prerequisite for recreational, residential, industrial and tourist use of the lake. Increased pathogens, phosphorus, and toxic substances threaten the health of the system. Technically the water is off limits for drinking without treatment, yet 18 towns use the water directly. Once phosphorus levels reach - 0.020 parts per million, there are reports of algae growth and substantial reduction in enjoyment of the lake. **Phosphorous levels in Malletts Bay tend to be 0.010 - 0.015 parts per million**, while the southern and northern most areas have mean summer phosphorous levels of over 0.030 parts per million. Toxic substances such as PCB's enter the lake from a variety of sources such as landfills and hazardous waste sites. Testing for toxic wastes can be very expensive and relatively little data on toxic substances has been collected in Lake Champlain.

**Increased recreational use** threatens the diversity of users and the quality of their recreation experience. Smaller and non-motorized boats are the first to be displaced by congested waters. Lt. Michael Vinton, Director of the Vermont State Police notes that small boat users headed to Charlotte to escape the crowding in Malletts Bay. Now Charlotte is overcrowded.

**Access to the lake** is being threatened by **development pressure, limited publicly owned shoreline property, and privatization of shore access.** Current accesses are not adequate for the demand. On a busy day at Malletts Bay Fish and Wildlife Access it is not uncommon to have 300 vehicles utilizing a parking areas designed for 175.

Privatization of both the shoreline and the water is a concern. The Public Trust Doctrine holds that the public waters are for public uses.

**Rapid growth** is behind many of the critical land-use issues of the Basin. Loss of access, sewage disposal, runoff, and destruction of wildlife habitat. The Lake Champlain Committee believes a Shoreland Management Act would be an effective tool for guiding lakeshore growth patterns.

## **Solutions: A Guide to Action**

### **A Healthy Lake**

**What Each Person Can Do:**

Maintain **septic systems**; regularly **pump-out boat holding tanks**; avoid or minimize use of **pesticides, herbicides and products with phosphorous**; properly dispose of household wastes - call the recycling hotline in VT (800-932-7100) for information.

**What Communities Can Do:**

Conduct sanitary survey of **septic system** failures and enforce repairs and upgrades; pass a **sewage disposal ordinance**.

**What State, Provincial and Federal Governments Can Do:**

Complete on-going **phosphorous study** and implement recommendation promptly; conduct **comprehensive assessment of toxic substances** in Lake Champlain; **review discharge permits**; upgrade monitoring program; adopt basin-wide **water quality standards**; aid communities and farmers to implement **best management techniques**; provide funding for upgrading sewage treatment plants.

**What the Lake Champlain Committee Will Do:**

Hold **Lake Night Forums** for basin community members to discuss issues; organize an **Environmental Service Corps** to connect university researchers with communities needing technical assistance; initiate a program to review **public sewage treatment** and industrial plant discharge and "get the problems cleaned up", distribution of the Lakeshore Property Owners Manual.

**Diversity of Recreational Opportunities:****What Each Person Can Do:**

**Respect** the needs of other recreational users; respect shoreline property; support acquisitions of public land.

**What Can Communities Do:**

**Purchase shoreland property** and develop for public recreational opportunities; build a **lakeshore walking and biking path** and connect with neighboring communities.

**What State, Provincial and Federal Governments Can Do:**

Consider a **limited entry permit system** for commercial uses; designate a **tourism center**; designate areas for **low impact recreational use only**, enforce **boating safety laws**; prepare a joint NY-VT basin wide recreation plan; purchase land for public use and conservation.

**What the Lake Champlain Committee Will Do:**

Continue bilingual boater education effort; continue to **advocate public access** to the lake; and develop criteria for prioritization lands for public acquisition.

**Wise Land Use****What Each Person Can Do:**

Plant **vegetative buffers** for erosion control and visual buffer; **recycle wastes**; help form **conservation commissions**; work to ensure shoreland property development and improvements are compatible with the natural character.

**What Communities Can Do:**

Inventory and protect **fish and wildlife habitat, wetlands, rare and endangered species areas**, and other critical environmental areas; adopt **shoreland zoning** with minimum setback, vegetative buffer zones, erosion control, and floodplain protection; create conservation commissions.

**What State, Provincial, and Federal Governments Can Do:**

Inventory and prioritize area for acquisition for access and habitat protection; distribute **model shoreland zoning ordinances**; use incentives to encourage local zoning ordinances; develop regional and state initiatives to increase the **economic viability of agriculture and forest lands**.

**What the Lake Champlain Committee Will Do:**

Distribute a **Planning Guide for Lake Champlain** towns addressing local planning issues; organize a conference for business, agriculture, government, developers, town officials and concerned citizens to address water quality; work with Conservation Commission; draft a Shoreland Management Act.

**Lake Champlain Recreation Study**

In 1989, New York and Vermont entered a cooperative agreement to develop an Action Plan for Managing Recreation on Lake Champlain. Four information gathering studies were conducted to provide baseline data for the recreation management plan. These studies include:

- The Lake Champlain Boat Study
- The Public Involvement Process
- The Lake Champlain Recreational User Surveys and
- The Recreation Resources Inventory

These four studies will be compiled into one report with a probable title of *Needs and Assessment of Lake Champlain Recreation* yet to be edited and distributed for review.

**Bulmer, Susan K., (1993), *The Lake Champlain Boat Study*, Waterbury, Vermont: Department of Forests, Parks, and Recreation, Recreation Division.**

The objective of the boating study was to **identify boating use patterns** through the following information:

1. the **total number** of boats on the lake and in each management zone.
2. the **type and size** of boat.
3. the **location** of the boat from shorelines.
4. the **activity** in which the boat was involved.
5. the **density of moorings** in certain bays of the lake.
6. a **comparison** of similar information from 1980 and 1992 to determine boating trends for these areas.

The study utilized aerial photography shot on one weekend day in July along with staff visits to various marinas at the same time as the flight, to conduct quality control checks.

**Lakewide Results**

A total of 12,425 boats were counted from the aerial photographs with 62% being motorboats, 25.4% sailboats, and 10.4% other boats including personal watercraft, sailboards, dinghies, canoes, kayaks and airplanes. Commercial vessels made up less than 1% of the boats. Eighty six point four percent (86.4%) of the boats were not in use, being either docked (54.8%), or moored (28.0%), or anchored (3.6%). No water skiers were apparent. Nearly all the boats (92.2%) were within 1,000 feet of the shoreline. Most motorboats were 21 feet less in length (78.6%) while most sailboats were between 22 and 32 feet (61.2%). There were 2.5 motorboats for every sailboat.

The management zone with the **highest total boat count** was Malletts Bay, followed by Burlington Harbor and Shelburne Bay, then Valcour Island and Cumberland Bay. When comparing counts with a 1980 aerial photograph, there was a dramatic increase in the number of boats either docked or moored in Shelburne and Malletts Bays. In 1980 there were 1045 boats in Inner and Outer Malletts Bay and 1534 in 1992; a 47% increase. Of



non-moving boats there was an 101% increase in docked boats, a 194% increase in moored boats, and an 11% increase in anchored boats.

In Malletts Bay, 6% of the boats in 1980 were in use moving and fishing compared to 4% in 1992. Malletts Bay experienced a decrease in large sailboats and a dramatic increase in larger motorboats 22 to 32 feet in length (253% increase).

The Management implications stated in the study include:

- High use areas of Lake Champlain should be addressed through management to alleviate existing or potential use conflicts and congestion.
- There will likely be increased boat usage in the management zones surrounding high use areas as the latter areas reach capacity threshold.
- Malletts Bay, Shelburne Bay, and Burlington Harbor will likely experience continued increases in boating use as the population increases and the economy recovers.
- Boaters need to be better educated on the "rules of the road" as indicated by the increase in moorings and boating use near designated ferry navigation routes.
- In some areas the proliferation of moorings are conflicting with navigation and other uses, indicating the need for comprehensive mooring management from the State and the towns development of mooring management zones.
- Safe boating education, including safe boat handling skills, rules of the road, navigation, and engine repair, is imperative as most of the boats on the lake are small watercraft and shouldand maintenance.

**Weaver, Kelly, (1994), *Developing a Recreation Plan for Lake Champlain: The Lake Champlain Recreational Users Surveys - August Draft*; New York Office of Parks, Recreation and Historic Preservation, Albany, NY.**

Recreational users surveys were conducted to obtain baseline information on recreation use patterns on Lake Champlain and to determine recreational issues; perceived problems and concerns of recreationists on Lake Champlain. Areas receiving high concentration of use were identified as well as the amount, pattern, and type of use. Users were asked to estimate their recreation-related expenditures. Boaters were asked of their knowledge of boating safety and navigation skills. Specific needs were identified for the various types of recreationists, public access, and non-boating facilities.

Nine recreational user surveys were distributed to a total of over 5,000 recreationists. Surveys were distributed to residents living within one-half mile of the Lake Champlain shoreline, public access site users, canal lock users, ice anglers, snow mobilers, state and municipal park users, marina users, and underwater divers. The review of this study focuses on information relevant to the Malletts Bay Recreation Management Plan.

**Key Recreational User Survey Findings:**

- Malletts Bay and Burlington are in distinct need for both improvement and additional boating access.
- Malletts Bay was identified as a high use zone by all user groups.
- Bike trails and beach/swimming areas are the top priorities for non-boating facilities.
- Sixty eight percent of the respondents had not taken a boating safety course in the past five years, while over 90% feel they are familiar with the standard waterway navigation aids and the "rules of the road".

**Recreational Issues**

- All user groups tended to agree that pollution is a severe problem on Lake Champlain.
- Most agreed that more pump-out facilities are needed.

- A majority agreed that more **public boat ramps and access sites** are needed, for year-round use.
- Most agreed that **landowners should have certain rights** protected for recreational use in front of their shoreline.
- All user groups agreed that **government should purchase more land for recreation**, public access and for preserving open space around the lake.

#### Potential Management Implications

- Existing **boating access facilities** should be upgraded and expanded.
- **Additional boating access facilities** should be pursued near populated areas and should be maintained for year-round use.
- **Boaters should be redirected** from access sites receiving excessive amounts of use to more underutilized facilities.
- **Access site signage** should inform of appropriate use of site.
- **Law enforcement** should be expanded at high use areas.
- A comprehensive **boating education program** should be implemented.
- New York and Vermont should support expansion of the **underwater historic preserve system** of Lake Champlain.
- New York and Vermont should explore **reciprocal fishing license agreements**.
- Educational programs for recreationists focused on the **protection of natural and cultural resources** of Lake Champlain should be pursued.
- Recreational **tourism opportunities** such as hiking and biking trails, beaches, and picnic areas should be developed with the basin.

#### **Smith, Maja, (1994), *Lake Champlain Recreation: Public Involvement*; Department of Forests, Parks and Recreation, Division of Recreation; Waterbury, VT.**

Extensive public involvement was a critical component in the development of the Lake Champlain Recreation Management Program. Opinions of lake users in both New York and Vermont was gathered through questionnaires, workshops, and meetings. This document identified the major issues for recreation and suggestions for resolving these problems as expressed by participants in the public involvement process.

#### The key findings of the public involvement process are as follows:

- There is a **diversity of year-round recreational uses** on Lake Champlain some having different and conflicting needs.
- **Declining water quality** is a deep concern of recreationists.
- **Inadequate public access** is a concern for all of the lake's shoreline.
- **Boating congestion** is a concern in some areas but is not considered a lake-wide problem.
- The potential of Lake Champlain as a **tourist destination** is great.
- **Education** is needed to reduce recreational user conflicts resulting from a lack of awareness and respect for other users and residents on the lake.
- **Increased education** is needed on the **boating laws and safe boat handling skills**.
- Significant **historic and cultural resources** should be preserved to maintain and enhance the quality of lake recreational experience.
- **Local government and grassroots efforts** must play an active role in the management and planning of Lake Champlain recreation.

Specific concerns particularly relevant in the Malletts Bay Recreation Management Plan expressed by user groups are as follows:

## I. Natural, Cultural and Historic Resources Stewardship

- Anglers:** Fishing derbies affect fish populations, catches should be reported to the State Fish and Wildlife Department; spawning habitat of walleye is deterioration, **bass fishing** should be prohibited during spawning season; the herbicide **atrazine**, commonly used in corn fields is threatening the smelt populations; New York, Vermont and Quebec need to better **coordinate fisheries' management**.
- Boaters & Swimmers:** Water quality in some areas is too polluted for swimming; the rapid spread of **nuisance aquatic species** need to be controlled.
- Divers:** **Anglers** are unknowingly **causing damage to underwater historic sites** by fishing near or on wrecks.
- Paddlers:** **Natural areas** near mouths of rivers on Lake Champlain are threatened by **increased motorboat use**.
- Sailing & Paddling:** The **scenic quality** is threatened by shoreline development
- Other Points:** More **pump-out facilities** are needed; boaters have been seen **dumping effluent** into the lake; **water clarity** is declining at the bottom of the lake; high quality recreational experiences are threatened by **declining water quality**; users perceive the causes include **failing septic systems, toxins, agricultural run-off and lack of sewage treatment**.

## II. Public Access

- Anglers:** New York boat accesses are superior to Vermont's; several boat accesses need improvements and/or expansion; **an additional boat access is desperately needed at Malletts Bay**. (Since 1991 two docks have been added for temporary docking and the access was dredged.) Fishing licensing fees need to be spent directly on maintaining State Fish and Wildlife access areas; **fishing piers are needed**.
- Boaters:** **Marinas are needed on the northern Vermont side of the lake** (there are 497 slips and moorings between 9 marinas north of Malletts Bay); **more mooring rentals are needed**.
- Divers:** Need accesses tailored to their needs; a **buoy system providing easier access to underwater historic sites** is needed. (Three sites in Burlington Harbor have this system.)
- Marinas:** Want recognition for **providing public access**; concern that the **public trust doctrine** could place limits on marinas and private clubs.
- Paddlers:** Concerned with their **use of Fish and Wildlife accesses** as they don't help pay for them - feel resentment from anglers (in 1993 Act 52 was passed allowing any vessel to use Fish and Wildlife Access areas); there is a need for **relatively undeveloped accesses** specifically for paddlers - **need one in Malletts Bay**.
- Personal Watercraft:** **Should not be banned from state park accesses**.
- Sailboarders:** **Need more access opportunities** at various places including Colchester Point.
- Sailors:** **Need additional small boat storage, pump-out, and mooring rental facilities and beaches** in northern portion of lake.
- Snowmobilers:** **Increased winter access** needed.
- Swimmers:** **Need trails to access the lake**.
- Other Points:** **Too much private shoreline ownership, need more public use areas set aside; maintenance and management at high-use public areas needed, need more accesses available to persons**

with disabilities and for lower and middle income sectors.

<b>III.</b>	<b>Recreational User Conflicts and Congestion</b>
Anglers:	Concern for noise and speeding disrupting anglers; permanent moorings in Malletts Bay make for difficult navigation early in season; sailors unwilling to change tack conflict with fishing boats.
Coast Guard:	Malletts Bay identified as a high use area; management plans needed to ease conflicts.
Marinas:	Additional accesses in Inner Malletts Bay would increase congestion, consider Outer bay new access as more appropriate; Town mooring management on Malletts Bay is acceptable if not over regulated.
Paddlers:	At Malletts Bay and other high use areas, paddlers complete with other boats at access area; concern about increased motorized craft use of tributaries, motorboat conflicts when do not see paddlers.
Police:	The "cut" at Malletts Bay is very congested on summer weekends, almost need a traffic cop.
Sailors:	Designated recreational user area needed; conflicts between sailors and fishing boats with planing boards; conflicts and congestion are only in limited areas, marina expansion and mooring placement should be regulated.
Swimmers:	Need restricted use areas designated.
Other Points:	Malletts Bay is extremely congested with moorings extending further out in bay; personal watercraft users need to learn safe boating and respect others; Canadian boaters exhibit a general lack of respect.

#### **IV. Improving Safety and Enforcement**

Boaters:	Need more enforcement to monitor intoxicated and reckless boaters.
Coast Guard:	Boaters need to know the dangers of the lake, navigation skills need improvement.
Divers:	Signs needed at designated historic preserve buoys; speed boaters need to be educated of diver-down flags.
Marinas:	Enforcement needs to be better distributed and more visible; boaters need to be aware of the lake's dangers and increase boating skills.
Paddlers:	Need increased enforcement for reckless endangerment.
Police:	Recreationists need more education on boater safety laws; Canadian and Vermont enforcement is inconsistent with Canadian boaters often in non compliance with Vermont laws; the number one violation is exceeding 5 mph. within 200' of the shoreline; number two violation is non-compliance to personal flotation device laws.
Sailors & Boaters:	Need more buoys marking reefs and ledges; the Malletts Bay "cut" is too narrow for sailboats (it is 200' wide)
Other Points:	Boaters need to increase knowledge of the "rules of the road", Malletts Bay is considered unsafe for boating by many - scattered moorings, inadequate enforcement, and lack of awareness of safety are concerns.

#### **V. Tourism**

Anglers:	A reciprocal fishing license between New York and Vermont for Lake Champlain is needed; need a <b>centralized tourist information center</b> , 5,000 - 6,000 yearly <b>fishing derby</b> participants need better means of acquiring tourist information; <b>tourist information at all Fish and Wildlife Access areas</b> .
Boaters:	The lake should be enhanced as a <b>destination with low-impact tourist promotion</b> .
Divers:	Significant <b>historic underwater preserves</b> should be promoted - the lake <b>could be a major diving destination</b> .
Marinas:	Vermont <b>permitting process too</b> restrictive and cumbersome, difficult to compete with New York marinas. In 1993 the permitting process was streamlined with the Lamoille County Supreme Court decision stating the <b>Department of Environmental Conservation did not</b> have authority to make rules regarding the <b>Public Trust Doctrine</b> ); a <b>5% tax on Canadian vessels</b> in Vermont longer than 30 days has led to <b>declining Canadian business</b> .
Paddlers:	<b>Lake Champlain Paddling Trail</b> could make the lake a paddling destination.
Sailboarders:	Lake use needs promoting.
Other Points:	Vermont and New York should <b>promote sustainable tourism</b> and a general perception is that <b>70% to 80% of boaters</b> in the summer are <b>Canadian</b> ; <b>Lake Champlain Bikeways</b> should be established.

### Vermont Shoreline Towns' Comments - Central Areas

This review focuses on the Central Area as most relevant to the Malletts Bay Recreation Management Plan. The Vermont Central Area, including Colchester, Burlington, South Burlington, Shelburne, Charlotte, Ferrisburg, Panton and Addison, **experiences the highest use and offers the most facilities** due to relatively high population base, tourism draw, and it is where the lake is broadest. It is also the area with the **greatest congestion and user conflicts**, growing concern for shoreline development and need to set aside public access opportunities. **Water quality** is a serious concern particularly regarding safe swimming and the proliferation of Eurasian milfoil. Failing and non-conforming **septic systems and municipal discharge** is significant concern. **Public access** is needed throughout the lake. **Colchester representatives expressed severe lack of public access** to meet the demands and the need for more town beach areas, shoreline conservation/recreation areas, and improvement for the existing Fish and Wildlife Access areas. **Malletts Bay** is identified as a **boating hot spot** resulting in intense user conflicts and congestion within the Bay and at the Fish and Wildlife Access Area.

Shoreline development was identified as a concern of the Colchester representatives particularly the **over-developing within scenic vistas**, the resulting **loss of access opportunities**, and the **high cost of land**.

### Public Input Meetings

**Public meetings** were held in seven locations around the lake to discuss recreation issues. This review will include only the Chittenden County meeting as relevant to Malletts Bay Recreation Management Plan. The **issues expressed at the public meeting were as follows:**

Small boats should be required to have holding tanks along with the existing rules for larger

boats; more **pump-out facilities** needed; the lake should have a **master plan for boating, swimming, and access areas**; concern for overuse and abuse of the lake by boaters and anglers; a **shoreline protection policy** is needed; boat inspection should be strengthened.

#### **Recommended Actions of the Public Involvement Process:**

- Permanently **acquire and maintain public access** to the lake for accesses, beach, fishing piers, marinas, shoreline parks and trails and identify funding mechanisms.
- Consider means to encourage **eco-tourism** in the Lake Champlain basin. Provide a **central tourist information center**; develop **recreation trails** such as the paddlers' trail and bikeway; upgrade and maintain existing facilities; develop a **marketing plan**; promote wise use of **underwater historic wrecks**; **educate tourist and local users** about the wise use of the resources.
- **Enhance education efforts of safety issues** through coordination of U. S. and Canadian Power Squadrons, U.S. and Canadian Coast Guards, and Vermont and New York State Police.
- **Develop recreation plans for high use areas** to address: mooring density, user conflicts, marina development speed limits, existing regulations, enforcement, access, noise, cultural and natural resources, and environmentally sensitive areas.
- **Address lack of coordination of regulation and enforcement across political boundaries.**
- **Include Quebec in recreation planning.**
- **Protect the lake's ecology and scenic quality.**
- **Enhance and continue programs to control nuisance aquatic species.**
- **Coordinate fisheries efforts across political boundaries.**

#### **Planning Implications from the Public Involvement Process:**

- The **myriad views of different recreation groups** needs to be carefully discussed.
- **Water quality** has a direct effect on the quality of the recreation experience and must be managed.
- **Public access** is a concern throughout the lake shoreline. Access needs should be assessed and prioritized.
- **Boating congestion** is perceived as a **localized problem** local and state agencies need to address.
- The lake has tremendous potential for **tourism**, needing promotion as low-impact tourism.
- **Recreational user conflict** on the lake are **due to lack of respect and awareness.** Education of appropriate use is needed.
- **Education** is needed of **boating laws and safe boat handling skills.**
- **Preserve the unique cultural and natural resources** to maintain the quality of recreational experience.
- **Local government and grassroots** must be involved in the management of recreation issues and planning.

**Farnum, Gregory J., (1994), *Lake Champlain Recreation Resources Inventory - Draft copy*, Department of Forests, Parks, and Recreation, Division of Recreation, Waterbury, VT.**

This report was developed along with the Lake Champlain Boating Study, Public Involvement, and Recreational User Surveys to supply base information for the Action Plan for Managing Recreation on Lake Champlain. The Resources Inventory is a compilation of the best information available assessing recreation facilities and resources along the shorelines of Lake Champlain. Seven types of lake related facilities were analyzed for their distribution and amenities:

- Boat Launches

- Marinas
- State, County, and Local Parks
- Beaches
- Campgrounds
- Fishing Sites
- Historic Places

The following is an extraction of those facilities located in or near Malletts Bay:

#### VERMONT BOAT LAUNCHES

<u>Site Name</u>	<u>Operator</u>	<u># of Cartop Launch</u>	<u># of Paved Ramps</u>	<u># of Gravel Ramps</u>	<u># of Slips</u>	<u># of Moorings</u>	<u>Vehicle Parking (Summer)</u>	<u>Vehicle Parking (Winter)</u>
Lamoille River F&W Access	1		2				30	30
Sand Bar State Park	1			1			400	
Brown Ledge Camp	8			1			25	
Champlain Club, Ltd.	9		1		112		160	500
Colchester Pt.. F&W Access	1	1	3			35		35
Malletts Bay Campground	9			1				
Malletts Bay Boat Club	9	1	1			170	160	
Malletts Bay F&W Access	1		4				90	90
Marble Island Resort & Marina	9	1			60	44	375	375

#### VERMONT MARINAS

<u>Site Name</u>	<u>Operator</u>	<u># of Cartop Launch</u>	<u># of Paved Ramps</u>	<u># of Gravel Ramps</u>	<u># of Slips</u>	<u># of Moorings</u>	<u>Vehicle Parking (Summer)</u>	<u>Vehicle Parking (Winter)</u>	<u>Pumpout</u>
Boatworks	9				20				
Champlain Club, Ltd.	9		1		112		160		Y
Coates Island Marina	9				20	68			
Hazeletts	9					30			
International Sailing Club	9					57	25		
Malletts Bay Boat Club	9	1	1			170	160		
Malletts Bay Marina	9				120	80			Y
Marble Island Resort and Marina	9	1			60	44	375	375	Y
The Moorings	9		1		96		80		

#### VERMONT STATE, COUNTY AND LOCAL PARKS

<u>Site Name</u>	<u>Operator</u>	<u>Playgrounds Y/N</u>	<u>Parking (Summer)</u>	<u>Parking (Winter)</u>
Airport Park	4	Y	175	110
Bayside Park	3	Y	150	80
Causeway Park	4	Y	5	
Malletts Bay State Park	1	Y		

#### VERMONT BEACHES

<u>Site Name</u>	<u>Operator</u>	<u>Parking (Summer)</u>	<u>Parking (Winter)</u>	<u>Beach (in feet)</u>
Sand Bar State Park	4	400		1000
Bayside Park	3	150	80	1000
Brown Ledge Camp	8	25		60
Malletts Bay Campground	9			1000
Marble Island Resort and Marina	9	375	375	500

#### VERMONT CAMPGROUNDS

<u>Site Name</u>	<u>Operator</u>	<u># of Tent Sites</u>	<u># of Vehicle Sites</u>	<u># of Electric Sites</u>	<u>Parking (Summer)</u>	<u>Parking (Winter)</u>
Brown Ledge Camp	8				25	
Lone Pine Campsites	9	-	260	35		
Malletts Bay Campground	9	19	119	100		

#### VERMONT FISHING SITES

<u>Site Name</u>	<u>Operator</u>	<u>Shore/Fishing (in feet)</u>	<u>Parking (Summer)</u>	<u>Parking (Winter)</u>
Lamoille River F&W Access	1		30	30
Sand Bar State Park	1	1600	400	
Bayside Park	3	100	150	80

Brown Ledge Camp	8	60	25	
Sand Bar Wildlife Management Area	1	50	10	0

## VERMONT HISTORIC SITES

Site NameCountyUnder Water Historic Sites

Phoenix

Chittenden

**Lake Champlain Management Conference, (1994), *Action Plan for Managing Recreation*, a Chapter in *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin; Pollution, Prevention, Control, and Restoration Plan - Draft October 1994*, Lake Champlain Basin Program, Grand Isle, Vermont.**

The *Opportunities for Action* report reviews facts about the condition of Lake Champlain including:

- Physical setting
- Social and economic setting
- Resource management setting
- Water quality and the health of the lake
- Living resources and habitat, and
- Human components

The *Opportunities for Action* report presents **eleven issues** identified through an extensive public participation and technical research effort as the "top priority" concerns. The eleven issues are:

- Reducing Nutrients
- Managing Nonpoint Source Pollution
- Presenting Pollution from Toxic Substances
- Protecting Human Health
- Managing Fish and Wildlife
- Protecting Wetlands
- Managing Non-native Nuisance Aquatic Plants and Animals
- **Managing Recreation**
- Protecting cultural Heritage Resources
- Building Capabilities for Local Watershed Planning and Protection
- Education and Involving the Public

Each of these issues is addressed by an Action Plan with the following sections:

1. Background
2. Issues
3. Goals and Objectives, and
4. Opportunities for Action

At the time of this review, the *Opportunities for Action* report is in a draft form. The final report will include two additional sections for each Action Plan:

5. Commitments for Action by Key Player/Legislative Initiatives, and
6. Economic Impact Analysis.

This review of *Opportunities for Action* focuses on facts about the state of lakes and the Action Plan for **Managing Recreation** as more relevant to the Malletts Bay Recreation Management Plan.



## Relevant Facts about the State of the Lake

### The Physical Setting

Lake Champlain is one of the largest freshwater lakes in the United States with 435 square miles of surface water, divided into five distinct lake segments. **Malletts Bay**, the smallest segment, is located between Colchester and the southeast shores of Grand Isle. **Water circulation in Malletts Bay is most restricted due to causeways built to the north and west.**

The topography and geology of the Champlain Valley was formed when the North American and European continents collided over 450 million years ago, and the land between the Green Mountains and the Adirondacks subsided. The valley was further sculpted by the action of glaciers; scoring mountain sides and depositing clays, silts, sand, gravel and rocks as the glaciers melted away some 12,500 years ago.

The general water flow pattern of Lake Champlain is south to north, draining into the Richelieu River. **Malletts Bay, however, drains to the west, through narrow passages in the causeway. Mallets Bay does not experience the extent of thermal layering that is observed in the Main Lake because of shallower depths, affecting the movement of pollutants and water temperature.**

### The Social and Economic Setting

Population of the Basin has increased an average of 1.2% each year over the past 40 years. When dividing the Basin into nine zones corresponding to drainage areas, the population of the **Malletts Bay zone has grown significantly faster than the other eight zones totaling 139% between 1950 and 1990, compared to 58% for the Lake Champlain Basin area as a whole.**

### Resource Management Setting

Current resource management has made progress in pollution control, however, efforts need to be made in **protecting the whole ecosystem** rather than specific resources. Lack of coordination, overlapping jurisdiction, and limited financial resources have negatively impacted effective management.

### Water Quality and the Health of the Lake

Phosphorous has generally been identified as the limiting nutrient for plant growth leading to **accelerated eutrophication**. Sediment, pathogens, and toxic substances entering the lake adversely effect individual organisms, and can endanger human health through contaminated drinking water, poor air quality, contaminated fish, and direct contact with contaminated water. **Outer Malletts Bay is identified as a site of concern for high levels of arsenic and nickel. Bayside Beach, the public beach in Colchester, was closed 12 days in 1988 due to high fecal coliform counts, but only 5 times during 1989 - 1993. Forty percent of lakeshore septic systems in Malletts Bay do not have current permits because they were built before the early 1970's suggesting a potential threat.**

### Living Resources and Habitat

The Basin harbors a **diverse population of plant and animal communities**; some of which are rare, threatened or endangered. Invasive non-native species and human influences pose threats to the living resources, as well as the recreational enjoyment of the Lake. Specific non-native plants and animal species include Eurasian water milfoil, water chestnuts, purple loosestrife, flowering rush, common reed, zebra mussels and sea lamprey. **Two locations in Outer Malletts Bay are being monitored for zebra mussels by the Vermont Department of Economic Conservation and Inner Malletts Bay has a Preliminary 1994 Zebra Watch Program site.** Since the settlement of Europeans in the Lake Champlain Basin, between 30-50% of the wetland

acreage has been lost or degraded. Malletts Creek has been identified as an area targeted for protection under the Wetlands Acquisition Strategy.

### **The Human Component**

The Basin residents enjoy a rich cultural history with many remaining historic structures and natural resources. The Lake also provides a wealth of recreation opportunities. The challenge is to support the human uses of the Lake while protecting the resources for the future. **Key recreation issues relevant to Malletts Bay are: providing public access, addressing congestion and conflicting uses, safety, navigation and enforcement, resource stewardship, and tourism management.**

### **Action Plan for Managing Recreation**

The Action Plan identified the problems, policy issues, goals and objectives, and draft opportunities for action. Lake Champlain offers a diversity of year-round recreational opportunities including fishing, swimming, boating, kayaking, sail boarding, scuba diving, skating, ice sailing, snowmobiling and cross country skiing. Total recreation expenditures in the Basin are estimated at \$2.2 billion in 1990 with seventy two percent attributed to Vermont.

Four technical studies were conducted to form the basis of the recreation action plan. The technical reports have been previously reviewed.

- Lake Champlain Boat Study
- Lake Champlain Recreation - Public Involvement
- Lake Champlain Recreation - User Surveys
- Lake Champlain Recreation - Resources Inventory

### **Issues:**

**Need for expanding or enforcing public access.** Lake access has repeatedly been identified as a concern. Public access is often thought of as boat launch sites, but also includes beaches, marinas, parks, fishing piers, trails, campgrounds, and scenic overlooks. Many launch sites on Lake Champlain are in need of repair or expanded facilities. The Vermont Fishing and Wildlife access at Malletts Bay is in need of restrooms, dock improvements, and increased parking. Management issues to address regarding public access is how to accommodate the diversity of users while alleviating congestion and conflicts.

**Congestions and Conflicting Uses.** Congestion and conflicting uses are localized problems occurring in high use areas with a diversity of user groups, such as Malletts Bay. Major problems leading to congestion and conflicts include: high boat concentrations, unsafe boating conditions, adverse environmental impacts, lack of awareness of other lake users, competition for limited access sites, inconsistencies in boating laws, conflicts between recreationists' use of resources, and noise pollution. Boating activity increased significantly from 1990 to 1993, particularly in populated areas such as Malletts Bay which experienced an 86% increase. Congestion and conflicting uses can be addressed through a combination of education and regulation. Regulations addressing moorings and the establishment of mooring management may be required in certain parts of the lake. Visitor Impact Management (VIM) process can be utilized to assess the impacts of recreational use on a resource. The process involves eight steps which provide managers with information to make decisions about changing conditions.

**Safety and Enforcement Concerns.** Disrespect and lack of awareness of boating safety laws and boating skills can create hazardous conditions. A majority of survey respondents indicated a need for mandatory safety concerns. In certain areas, increased enforcement is critical. Lack of coordination of laws across political boundaries makes it difficult for boaters

to comply with the laws.

**Current Management: Roles and Responsibilities.** The table on the following page identified the levels and number of agencies with jurisdiction on Lake Champlain. **Clarifying these roles and responsibilities** can simplify management, decision making, and enforcement.

**Tourism Promotion.** Lake Champlain has not been the focus of a concentrated tourism program. Many basin residents indicated that coordinated planning, research, and marketing could promote Lake Champlain as a tourist destination. Such efforts to increase tourism should improve the economy, but must not compromise the resources.

**Linkages with Natural, Cultural, and Historic Resources Stewardship.** Recreational use of Lake Champlain affects and is impacted by the condition of the resources. Water quality is critical to maintaining high quality recreation experiences. Water-based recreational activities pose some threats to water quality through fuel exhaust and spills, discharging of boat hold tanks and greywater.

The proliferation of **nuisance aquatic species** significantly affect recreational experiences, while boaters may unknowingly be responsible for the spread of the unwanted species.

**Cultural and historical resources** need to be made accessible to the recreating public but managed to avoid overuse and degradation. Lake Champlain contains a number of historic underwater wrecks which may be better protected through designation and increased visitation.

**Fish and wildlife** abound in Lake Champlain though there are concerns for threats to habitats, proliferation of competing nuisance species and lack of access.

**Economic considerations** for implementing plans for managing recreation recognizes investments in protecting resources and promoting tourism can increase local income and employment. To distribute the cost of implementing the plan, **those who benefit economically** from increased recreation opportunity could help pay for it. **User fees** can also be effective in raising some funds.

### **Goals and Objectives.**

**"Recreation Management Goal: Manage Lake Champlain, its shorelines and its tributaries, for a diversity of recreational uses while protecting its natural and cultural resources."**

**The following key objectives are identified:**

1. Increase and improve **public access** opportunities to the Lake for water and non-water activities.
2. Develop reliable methods of measuring recreational use which **alleviate user conflicts and congestion** in areas of concern.
3. Develop a **public education and information program** which emphasizes recreational user ethics, boating safety and wise use of resources.
4. Identify **areas in need of additional enforcement** and make recommendations to increase enforcement capabilities.
5. Explore **sustainable tourism** development that highlights the natural, cultural and historic character of Lake Champlain basin and instills a sense of appreciation and stewardship of the resources.
6. Identify appropriate **locations for shoreline recreational uses** that do not adversely impact upon shoreline environments.
7. **Coordinate Lake use planning with municipal shoreland planning.**

8. Secure funding to achieve recreation management objectives.

#### Draft Opportunities for Action

##### A. Improving and Enhancing Existing Public Access Sites.

1. Using **Regional Partnerships** between local, state, and federal government and non profit organizations.
2. Establish a **Dedicated Trust Fund** by redirecting existing funds or generating new revenue.
3. Encourage **Adopt-an-Access** programs to involve local citizens' groups in enhancement of public accesses.

##### B. Develop Additional Public Access Opportunities.

1. Develop and implement a strategy to provide new public access opportunities.
  - a. Complete the **public access strategy** including identifying potential sites, prioritizing, and explore options for funding.
  - b. Implement strategy by **securing prioritized access sites**.
2. Provide funds to local governments and non-profits to develop additional public access sites through a **state level grant program**.

**Economic considerations:** Local residents, visitors, and businesses in the area who cater to "recreationists" are beneficiaries.

##### C. Encourage Tourism.

1. Encourage new opportunities for recreation in the **Lake Champlain Basin as a total package** emphasizing sustainable recreational opportunities including:
  - a. natural and cultural **interpretive trails**.
  - b. **Lake Champlain Bikeways**.
  - c. **Lake Champlain Paddlers Trail**.
  - d. **joint New York and Vermont fishing license agreement**.
  - e. **lakewide underwater historic preserves program**.
  - f. **comprehensive guide to all public accesses**.
  - g. **centralized tourist information center**.
  - h. **scenic byways designations**.
  - i. **interpretive and education programs**.
  - j. **expand tourist facilities**.

Economic considerations of tourism investments is ensuring continued economic and employment future of the area. **Local residents** currently account for **44% of tourist expenditures** in the Basin.

##### D. Reducing Congestion and Conflicting Uses.

1. Evaluate the need for **local recreation management plans** in high use areas of the Lake.
2. **Assist communities** who wish to develop local recreation management plans.
3. Enhance **user education programs** and coordinate boating safety programs.

Economic considerations: User groups can help develop and disseminate information. Advertising can help pay for educational materials.

##### E. Improving Safety and Enhancement.

1. Evaluate and improve **consistency of regulations and enforcement**.
  - a. Evaluate existing regulations and enforcement and recommend changes.
  - b. Make regulations and enforcement more consistent **across political boundaries**.
2. Evaluate **Navigational Charts** identifying areas where safety has become an increasing issue.

Economic considerations: County, state and federal agencies generally bear the cost of enforcement. Users will be the primary beneficiaries. Users fees through licenses, taxes on boating-related purchases, and offense fine, are potential funding sources. Offense fines should match the severity of the crime and discourage repeat offense.

## Malletts Bay Studies

### **Harbor Commission, (1983), *Proposed Regulations for Surface Water Management*, Town of Colchester, Vermont.**

#### **Selected recommended regulations:**

##### **"General Requirements**

16.2 Approved access to moorings may be via direct ownership of land, deeded access rights or approval of the property owner for a specific access across his parcel. State of Vermont Fish and Game Shoreland, Municipal and State Waterfront Lanes are unacceptable as mooring access points.

16.9 For non-marinas, **no more than four (4) boats may be moored with access from the same property.** Two (2) adjacent shoreline property owners may apply to the Harbor Commission for permits for shared docks involving more than four (4) dock moorings but not more than eight (8) moorings including buoy moorings. A shoreline property owner may only share one dock with adjacent shoreline property owners.

16.10 Mooring Permits in the **first 250 feet outward from the low water level will be restricted to shoreline property owners.** Shoreline property owners may not place moorings outside of their **extended colonial property lines** without written permission of the affected adjacent shoreline property owners within the above defined 250 foot band. Shoreline property owners **may only place buoy moorings outside of the 250 foot band when no satisfactory mooring space exists within** as bounded by their extended colonial property lines.

#### **SECTION 17 REQUIREMENTS FOR MOORING MANAGEMENT ZONE 1:**

17.1 A fairway shall be established in the center of Spauldings Bay by **not allowing buoy mooring or anchoring more than 400 feet** from the low water level of the nearest shore.

17.2 No boat may be moored within this zone without a legal point of access from a property within this zone. The State of Vermont Fishing Access is not an acceptable mooring access.

17.4 Speed shall be limited in the southern end of the bay to **5 mph for the first 600 feet outward** from the State of Vermont Fishing Access.

17.5 **Boats may not buoy, moor or anchor between the fishing access launching ramp and the fairway** described in Sec. 17.1 above. The purpose of this is to maintain a fairway to and from the fishing access.

18.2 **Permits outside of the 250 foot line** but within the mooring management zone will be issued on a **first come, first served basis.**

18.3 A protection zone the width of Bayside Park (approximately 400 feet) shall be established there extending **outward 800 feet** from the Low Water Level. No mooring, anchoring or non-manually propelled vessels are allowed within this zone.

18.4 Speed shall be limited to 8 mph in this entire mooring management zone."

**Bayshore Committee, (1987), *Report and Recommendations of the Bayshore Committee*: Town of Colchester, VT, unpublished document.**

In April 1987, the Bayshore Committee was commissioned by the Colchester Select Board to develop an improvement plan for the **Lakeshore Drive** area from Bayside Park to Nourse's Corner, addressing the **land, road, and water problems** that have plagued it over the years. Through a series of neighborhood meetings and consultations with planners, engineers, and scientists, the committee identified the following findings and recommendations.

**Background**

Campers began coming to Malletts Bay in the 1880's by horse and buggy. By the 1920's, several private camps developed along Lakeshore Drive and George Clarey opened "Clarey's Bayside Vacationist Paradise of housekeeping cottages and private beach. The Clarey property was purchased by the town in 1960 to form **Bayside Park**, remaining today as the only municipal beach. This section of Lakeshore Drive today is very densely populated with summer camps, many very close to the road, many of which are being converted to year-round residences.

**Specific Problems Identified by the Committee**

- a. **The road** is narrow, winding, and **extremely unsafe**, without shoulders, with inadequate parking, and buildings within the right of way.
- b. **Water quality** has experienced a "marked decline in the last three years", with noticeable effects of nutrient loading and sediment runoff. There is much concern regarding the "antiquated" septic systems in close approximation to the bay is assumed but not verified.
- c. **Water activities and lake traffic.** Residents are concerned with the growth of water activities, the lack of speed zones or enforcement of the "rules of the road" and the lack of town policy regarding the development of future marinas.
- d. **Erosion of the bank.** Many residents spend considerable amounts to stabilize the steep banks of their property.
- e. **Aesthetics.** There is a lack of planting and beautification. The area is crowded, offering few scenic vistas to or from the lake.
- f. **Public Access** is essentially nonexistent leading to frequent trespassing.

**Recommendations**

Establish a **Colchester Shoreline Commission** with the goals of protecting or preserving the shores and waters of Malletts Bay and develop programs for increased public access (visual and physical).

**Objectives of the Commission should include:**

1. **Develop a detailed plan of the Shoreline area** as an overlay district to supplement the Colchester Master Plan addressing public access, reduction of adverse environmental inputs, improved scenic controls, improved transportation, and coordination of land uses.
2. **Reconstruct Shoreline Drive** with safety and visual improvements considering drainage slope stabilization, scenic overlooks, bike lanes, and natural landscaping. Eliminate the designation of Route 127 along Lake Shore Drive and establish a legally binding right of way.
3. **Develop a protection/preservation plan for the Bay.** In a 1986 random survey 92% of respondents cited water quality of Malletts Bay as their primary concern. That summer, Bayside Park failed the fecal coliform test seven out of fourteen times. The Colchester Shoreline Commission should implement a water quality protection and preservation plan.

Through technical assistance four appropriate agencies the commission should assess the effects of farm runoff, undertake a review of the town's subdivision regulations regarding erosion and sediment control and make a recommendations for sewage disposal for the shoreline area.

4. **Establish Harbor Program.** In 1981 through 1985, a Harbor Commission was formed and proposed "Regulations for Surface Water Management", but town officials decided to delay implementation until a clear and present need for such a program was identified. The Specific recommendations suggest a Harbor Program through the Colchester Police Department should place an emphasis on safety and protection and should be funded through a mooring fee structure. Colchester should seek local jurisdiction over its water and draft ordinance similar to shore developed in Shelburne.
5. **Establish standards for future shoreline development/aesthetics.** Standards for shoreline development should be established by the Planning Commission and require design review.
6. **Improve visual/physical access to Bay.** Identify potential sites for public access through the process of developing the shoreline Plan and pursue all available methods for creating access including: accepting land and conservation donations, purchasing lakeshore property, obtain rights of first refusals, work with land trusts.
7. **Develop methodology for shoreline zoning.** The Shoreline Committee should review the shoreland zoning regulations and amend to address erosion control during construction, aesthetics, tree cutting, and building and septic setbacks, on-site septic systems be required to meet current standards when converting a camp to year-round uses.
8. **Funding mechanism.** To minimize financial impact on residents, the Commission should: establish a recreation/scenic land trust fund; develop an impact fee for future developments with 500 feet of the shoreline for addressing run-off; develop mooring fees to exclusively support the Harbor Programs; seek federal and state funds for Lakeshore Drive improvements; encourage gifts and establish a "Friends of the Bay" program, and establish a tax increment finance (TIF) district within the shoreline area.

### **The Henderson Group, (1989), *Mallets Bay Capacity Study Draft*, for the Town of Colchester, Malletts Bay Advisory Committee.**

This study contains two parts; an inventory and analysis to the physical carrying capacity of Inner Malletts Bay and a methodology for a water quality monitoring to be used in developing a phosphorous based water quality model. This review addresses only the carrying capacity part.

#### **Carry Capacity**

The boating inventory identified 1,074 boats in Inner Malletts Bay with approximately 38% (409) sail boats and 62% (664) power boats. Additionally, there were approximately 362 miscellaneous watercraft (canoes, row boats, dinghies, personal watercraft and sailboats) for a total of  $\pm$  1400 vessels kept in Malletts Bay. **Seventy five percent of the 1074 boats were docked or moored through marinas or boat clubs** located along the south west shores of the bay. while the remaining 25% were located on private docks or moorings. Analysis of boating use by areas show the following:

Marble Island/Cave Island Area	7.3 boats/acre
Spaulding Bay Area	8.6 boats/acre
Coates Island Area	4.0 boats/acre

**Active Boating Use of Inner Malletts Bay**

Counts of active boats identified the average maximum number of boats ranged from 22 to 93 with an **average maximum of 43 boats at one time**. A 1980 boat count showed a range of 68 boats at early morning count and 141 boats at late afternoon count, using aerial photography.

Weekend afternoons were the busiest. Weekday sailing classes and race nights were also active. Morning boat use tended to be for fishing. Waterskiing tended to occur most afternoons and jetskiing was most likely to occur on weekends in good weather.

Various studies indicate a range of 15 to 40 acres of water surface per boat as a **recreational carrying capacity**. **Twenty acres per boat, regardless of type, was selected for this study**. Given 2100 acres of total water surface in Malletts Bay, it was calculated that 105 boats could actively use the Bay without undue conflict. (Note: the report does not identify if the unusable acreage due to shallow depths and presence of moorings and docks were deleted from the total surface water acreage. Also, little verification for the 20 acres per boat standard is offered.)

**Analysis**

The daily maximum **average use of 43 boats represents approximately 48.8 acres per boat** which does not exceed the safety standard of 20 acres per boat. The count of 1980 with a high count of 161 boats, approximates 13 acres per boat, significantly exceeding the 20 acre per boat standard.

The study does mention that different types of boats tend to use different areas and that water management "may be no more difficult than formalizing of the existing patterns...." Higher use near the marina areas may increase conflict in Areas A, B and C where moorings are near or at capacity. Areas D and E offer potential expansion of moorings, docks, and slips.

**Dunn Associates, (1990), *The State Park at Malletts Bay, Colchester, Vermont, Burlington, VT.***

A design for the state owned 290 acre parcel was generated by Dunn Associates to respect the public's desire for a relatively low volume use including a Nature/Interpretive Center, pedestrian trail, small group picnic shelter, and family picnicking. Camping and swimming facilities were considered inappropriate uses.

*Town of Colchester Master Plan* is currently being updated.



**DeCesare, Laurie, *A Guide to Colchester's Parks and Natural Areas*, In Cooperation with the Colchester Parks and Recreation Department.**

Four of the thirteen parks and natural areas described have shore frontage on Malletts Bay:

Bayside Park  
Colchester Bay/Railroad Bed  
Malletts Bay Fishing Access  
Malletts Bay State Park

**Bayside Park** is located at the intersection of Malletts Bay Avenue and Lake Shore Drive with a relatively small parcel on the bayside of the road offering a town beach and picnic tables. The bulk of the park is across the street with parking, tennis, basketball, playground equipment, and extensive trails connecting to a neighboring system.

**Colchester Bay/Railroad Bed** is located on Airport Road just past Airport Park. Facilities include a short wooded foot path to a grassy observation area and the crushed gravel foot path of the old railroad bed. A board walk is planned for access to the bay.

**Malletts Bay Fishing Access** is located at the intersection of Prim Road and Lakeshore Drive. This active public access area offers a surprising diversity of plant life including shoreline, treed wetlands and open field species, Mallard ducks, shagbark hickory, jewelweed, and sensitive, cinnamon, interrupted and royal ferns, American toad, lamb's quarters, and motherwort.

**Malletts Bay State Park** (as yet undeveloped) is located off Raymond Road on Niquette Bay of Malletts Bay. Current facilities are limited to footpaths and natural beach; proposed facilities include a nature interpretive center, picnic shelter, and handicap-accessible trails.

**Scerderian, Maggie, Water Quality Coordinator for the Town of Colchester, (1993), *Malletts Bay Water Quality Inventory Report*, Prepared for the Colchester Board of Selectmen and the Malletts Bay Advisory Committee.**

Water Quality Inventory reports have been prepared every year since 1990. This review includes the latest completed report (1993) with reference to inventory results of the 1994 season.

This document reports the results of the **water quality monitoring through the 1993 summer season at Malletts Bay**. The heavy recreational use both requires and threatens high water quality in the Bay. Samples are tested for fecal coliform as an indicator of water quality, particularly critical for determining health risks to swimmers. Samples are taken three to four times weekly at the Bayside Park swimming beach and twice weekly at 12 other locations throughout the Inner Bay. The health standard for fecal coliform in recreation surface water is 200 CRU/100 ml. If samples exceed the standard two consecutive days, the beach is closed. This summer there was one occasion of two consecutive days exceeding the 200 CFU/100 ml. (Test results for the summer of 1994 indicate three days - none of which were consecutive, of counts above 200 CFU/100 ml. Summer 1994 Water Quality Monitoring Report is not completed for review at this time.)

At the twelve other sites the average percentage of exceedances was 35.4%. This is up from 23.6% in 1992 and 15.3% in 1991. The sample from two sites at Smith Hollow Stream exceeded the standard 75% and 90% of the time; while 70% of the Fish and Wildlife Access and

65% of Crooked Creek samples exceeded the standard. Comparing this year's results with the previous two indicates that bacterial contamination is widespread and generally increasing.

**Key Recommendations:**

- Utilize **education and prevention** to deal with water quality issues, as sources of pollution are difficult to identify.
- Inventory **septic systems** to determine the **scope of reclamation** necessary to bring the systems up to code.
- Establish a **septic system policy** and raise awareness.
- Include a joint project between the Water Quality Coordinator and Colchester School curriculum. Projects could include:
  - a brochure of why we should not feed the ducks.
  - create a map of the Malletts Bay watershed.
- Consider making the **Water Quality Coordinator position year-round** to allow time to address policy and education issues.

**Town of Colchester, *Zoning Regulations and Official Zoning Map*, Adopted March 9, 1982, latest amendment August 20, 1993 (reviewed as relevant to the Malletts Bay Recreation Management Plan).**

According to the Colchester Zoning Map, the northern shores of both Inner and Outer Malletts Bay are predominantly zoned R-1 Low Density Residential with the exception of a large parcel at the mouth of the Lamoille River zoned Commercial. The southeast shoreline of Inner Malletts Bay is quite varied with a mix of R-1 Low Density and R-2 Medium Density Residential with interspersed stretches of commercially zoned lots. Lake Shore Drive from the Bayside Park to the intersection of Prim Road is predominantly Commercial with a few stretches of R-1 Low Density Residential. Coates Island is zoned entirely R-1 Low Density Residential while Malletts Head is a mix of RR Low Density Rural Residential and Commercial. The southern shore of Outer Malletts Bay is a mix of R-2 and R-3 Medium Density Residential an area of R-1 Low Density Residential at Mills Point and Wetland/Floodplain between Mills and Porters Points.

- **Wetland/Floodplain District** uses are limited to agriculture with provision for public or commercial recreation as conditional use.
- **RR Rural Residential District** on Malletts Head allows residential, churches, agriculture and many recreational uses including residential marine associations but exclude marinas and yacht clubs.
- **R1, R2, and R3 Low and Medium Density Residential Districts** allow residential, education, religious, cultural, and some recreational uses including residential marine associations, but exclude marinas and yacht clubs. Variations between these districts tend to focus mostly on lot and building requirements: RR and R-1 require 40,000 s.f. minimum lot size, R-2 is 20,000 s.f. and R-3 is 15,000 s.f.
- **Commercial District** permits mobile home residential, hotels, campgrounds, retail, offices, religious; and many recreational uses including marina and yacht clubs, but exclude residential marine associations.

The requirements for **residential marine associations** for districts permitting them are: to have a minimum shore line frontage of 150 feet plus 30 feet for every boat beyond the fifth boat belonging to the marine facility; pump out facilities if accommodated boats have sleeping facilities; and one parking space. Marinas and yacht clubs must have 150' of shoreline frontage and must have one parking space per berth.

The review of any shore-based or shoreline facility shall be reviewed under the Subdivision Regulations and that the proposed construction will not create a hazard to navigation, be a source of nuisance due to noise or fumes, interfere with or prevent the use of adjacent shoreland property, and it will be compatible with adjacent land uses. The Harbor Commission and Department of Water Resources may be asked to review and comment on the application.

**The Shoreline District is an overlay district extending 500 feet inland from the normal mean water line around Colchester Pond, Lake Champlain, Winooski and Lamoille Rivers. Permitted uses are:**

- Those uses permitted in the underlying district.
- Piers, docks and other structures attached to the shore not to exceed 800 sq. ft. or extend more than 150 feet into the lake from mean water level.
- Pumphouse designed for ordinary residential or camp use.
- Private residential use boathouses built behind the shoreline, at least two (2) feet above the mean water level with roof line not to exceed fifteen (15) feet above mean water line.
- Shore based facilities for pumping and/or disposing of wastes from boats (subject to appropriate Town and State Health Regulations.)
- Recreational uses such as picnic ground parks, playgrounds, boat launching ramps, swimming areas (beaches) natural areas and hunting and fishing.
- Seawalls, retaining walls and similar structures detached from and not an integral part of a building.
- Seasonal-temporary type private residential or camp use docks are exempt provided they do not exceed the dimensional requirement of Sec. 1001.2."

**Key Conditions and Requirements:**

- No more than 25% of trees 4" and over in diameter can be cut within 100 feet of the shoreline.
- All buildings except piers, docks, floats, boathouses, and pumphouses shall be set back 100 feet from the shoreline.
- On-site sewage disposal systems shall be set back at least 100 feet from the shoreline and at least 4 feet above flood water elevation.

**Relevant General Provision**

- Setback from Top of Bank (slopes) requires all buildings to be set back at least 50 feet from the top of banks with a slope exceeding 45° of streams, rivers, brooks, and bodies of water.
- No minimum number of parking spaces per unit of measure is identified for marinas or yacht club.

**Town of Colchester Selectboard, (1993-1994), Chapter 14, Vessels, Moorings and Waterways, Article 1 - General, Original Document Dated November 9, 1993, Amendments #1, Dated April 16, 1994, plus Amendments for review at public hearing on September 13, 1994.**

**Edited for Selected Key Regulations**

**Sec. 14-1 PURPOSE**

The purpose of this Ordinance is to provide fair and equitable mooring privileges within public waters of Lake Champlain adjacent to the Town of Colchester.

**Sec. 14-2 SCOPE**

This Ordinance shall relate to the use, location, construction, installation, and maintenance of

moorings, placed in the public waters of Lake Champlain adjacent to the Town of Colchester consistent with 10 V.S.A. §1424(a) through (d).

## ARTICLE II - PERMITS AND FEES

### Sec. 14-8 EXISTING AND NEW MOORING PERMIT REQUIRED

No person shall establish or maintain a mooring in the public waters adjacent to the Town of Colchester without first obtaining a **mooring permit** pursuant to and as authorized by this Ordinance and "Rules Regulating The Mooring of Vessels in Malletts Bay" adopted by the Vermont Water Resources Board.

The following mooring permits are established:

1. Existing or New Individual mooring permits,
2. Existing or New Marina mooring permits,
3. Existing or New Yacht Club mooring permits,
4. A combination of any of the above permits.

Within each class of applicants, higher priority shall be given to those mooring arrangements that are the most space efficient per vessel accommodated.

Mooring permits will not be removed to make room for those of a higher priority. Each individual permit holder may be issued no more than four (4) individual permits.

### Sec. 14-9 EXISTING MOORINGS

**All lawful moorings which existed prior to January 1, 1992 shall be provided special status in accordance with the following provisions:**

A. Prior to the effective date of this Ordinance, the Harbormaster shall conduct an inventory of all existing moorings and establish a record of same in accordance with application procedures provided for in this Ordinance.

B. The Harbormaster shall determine whether or not each existing lawful mooring complies with this Ordinance. Each existing lawful mooring shall be identified on said record as being "complying" or "non-complying."

C. Upon the filing of a complete application for a permit, payment of the required permit fee, and the finding that the application is in compliance with this section, the Harbormaster shall issue a permit for the complying mooring. In case of conflicts, first priority shall be given to existing moorings that have been authorized by a permit issued under 29 V.S.A. Chapter 11. Second priority shall be given to existing moorings that are not authorized by permit issued under 29 V.S.A. Chapter 11.

D. Non-complying existing moorings shall be assigned to one of the following classes:

1. Class A Moorings are those moorings which do not pose an environmental or navigational hazard.
  - a) A Class A mooring may be continued provided that no transfer or enlargement may occur unless the mooring is brought into compliance, except as provided under Sec. 14-12. The Harbormaster shall issue a permit and attach restrictions regarding transfer and/or enlargement.
2. Class B Moorings are those moorings which pose an environmental or navigational hazard.
  - a) A Class B mooring must be brought into compliance or, removed from the water

within seven (7) days of notice to the person who has established or maintains the mooring(s).

The Harbormaster may require relocation of existing moorings after issuing a written determination stating the reasons for relocation as authorized by Section 14-11.

#### Sec. 14-10 NEW MOORING PERMIT APPLICATION

Within the space available, requests for new mooring permits will be processed by the Harbormaster on a first come first serve basis. If more than one person applies for a permit for the same space, the Harbormaster shall in processing applications give priority to persons in order the order the complete application was received by the Harbormaster.

#### Sec. 14-11 IDENTIFICATION and GENERAL REQUIREMENTS

For each mooring, a numbered identifying tag will be issued with the written permit. The tags shall be attached above the water in a visible location on each mooring buoy. The permit holder shall not cause the tag affixed to the buoy to be removed.

**Mooring space shall be provided to applicants having access by the lawful use of public or private lands.** For those individuals who do not have available mooring space, provided he finds that travel to and from the access to the mooring will not create a hazard to public safety or a conflict with other established uses of the water and not exceed 1,000 feet from the point of access. In the event of a conflict for the same mooring space, the Harbormaster shall process the applications as provided for in Section 14-10.

Within any Mooring Management Zone, the Harbormaster shall not permit new mooring(s) and require the relocation of existing moorings where the placement of a mooring presents actual or potential adverse impacts on established 1) recreational and other uses of the water, including private or public water supplies, and 2) Class I and II wetlands, endangered plant and animal species, fish or wildlife, public lands and natural scenic areas.

The Harbormaster, upon the direction of the Select Board, **may within MMZ 1, 5, and 6, prohibit new moorings or limit their placement until May 30 of the year following the adoption of a management plan for these waters.**

Permit applicant(s) will be notified, in writing and mailed within five (5) business days from the date of application, of acceptance of the application and/or status of the application.

**Approved access to a mooring may be by direct ownership of land, written approval of the property owner, or legal access across a parcel. Municipal and state waterfront lands are acceptable as mooring access points,** provided the use of the public facility for mooring access purposes is not inconsistent with the lawful use of the public lands."

Before a permit is issued, applicants shall demonstrate that 1) the mooring will be located within a reasonable distance from the point of access, 2) the point of access has adequate on-shore support facilities for the number of moorings served, and 3) the point of access support facilities are consistent with applicable zoning requirements and state law.

## Relevant Studies from Other States

### New Hampshire

#### *New Hampshire Office of State Planning, (1991), A Summary of the Plan for the Squam Lakes Watershed.*

The Squam Lakes Watershed Plan is a first in a series of lake watershed plans throughout New Hampshire. The Squam Lakes, located in central New Hampshire, have experienced growing demands for watershed development and recreational lake use which is threatening the very resources that are the attraction. The watershed, comprised of more than 42,000 acres with 7,847 acres that is water surface area, includes parts of six towns. The Watershed Plan addresses both land and shoreline planning and surface-water recreation planning. Key recommendations of the Watershed Plan relevant to the Malletts Bay Recreational Management Plan are as follows:

The State of New Hampshire through legislature and agencies should:

- Adopt a **three zone plan for water surface uses**:
  - A **nearshore "quiet zone"** extending **250 feet out** from the shoreline where motorized craft would be required to move at headway speed.
  - A **wildlife protection zone** extending an **additional 250 feet** (for a total of 500 feet from shore), **along shoreline with known loon nesting and brooding sites or other critical habitats.**
  - A **general activity zone** covering the remainder of the lakes, with **speed limits and types of use governed by existing laws and regulations.**
- Consider the **adoption of time zones** with more restricted boat use on weekends and less restriction on the weekdays. The restrictions might include limiting activities such as waterskiing or highspeed cruising to certain times of the day on certain days of the week.
- Prepare a long-range plan to **achieve further reductions in the size, speed, and power of boats** on Squam Lakes, in a fair, non-discriminating manner.
- Develop a **boater-licensing system** to increase knowledge of boating laws, and skills, and to provide funds for safety and education programs.
- Expand the definition of **"public"** access to include **non-state owned areas that are available to the general public for access.**
- Develop a long term **monitoring program for water quality** for more consistency of data.
- Use the water quality data to **identify hot spots**, and to aid in developing water use regulations.
- Determine a **"water budget"** to set nutrient budget for lakes.
- **Prohibit dug-in boat slips.**
- Provide adequate **funding** for lake monitoring and supervising boating safety principally through the **dedication of boat licensing fees.**

#### The Municipalities

Amend zoning ordinances to:

- Create and adopt **wetland, floodplain, and aquifer overlay districts.**
- Adopt **shoreland overlay district** that requires vegetative buffers and building setbacks, and discourage the use of herbicides, pesticides, and fertilizers.
- **Prohibit development on slopes greater than 25%.**
- Require a **minimum one-acre lot** with at least **200 feet shore frontage** and building height limited to **35'.**
- List **prohibited land uses** which threaten surface or ground water quality - ex.: junkyards,

- salt piles, underground tanks, and hazardous wastes.
- **Inventory** wetlands, septic systems, and **threats to water quality**.
- **Revise subdivision regulations** regarding subdivision review provide for **protection of wildlife habitats and natural resource areas**.
- Review codes for construction to **minimize erosion** and requires the use of **vegetated open swales rather than storm drains**.
- Encourage landowners to apply for **current uses**, and for donating or selling conservation easements; and the development of forest management plans.
- Adopt **health ordinances** addressing installation maintenance and inspection of septic systems, wells, and underground storage tanks.
- Create **uniform road salt management policies**.
- Encourage improved lake ecology education programs in school district.

#### **Local Organizations and Groups**

- Continue boat use surveys, water quality monitorings.
- Improve outreach and coordination efforts.

#### **Individuals**

- Be aware of issues and practice conservation measures in all home and business activities.

### **New Hampshire Office of State Planning, (1991), *Public Access Plan for New Hampshire Lakes, Ponds, and Rivers*, Concord, NH.**

This report on public access to waterbodies of New Hampshire reviews past studies programs and legislation and makes recommendations for standards, priorities, designs and implementation recommendations.

The recommended planning standards for "great ponds" suggests **one public access point for each 5 miles of shoreline or for every 1,000 acres of surface water**. The intent of these recommended standards is to distribute access around great ponds, to avoid congestion and provide for a variety of public access. These are recommendations only and should be modified to respect conditions of specific waterbodies. The largest water bodies should offer the greatest variety of accesses, relating types of accesses to opportunities in conditions for use.

**Potential funding sources** for new and improved public access facilities could include:

- Increased **boat registration fees**.
- A \$10 million **bond** for a twenty year **access program**.
- **Golden Passport Program** where residents buy a permit for a fixed fee allowing them to use state access facilities for any given year and/or season.
- **Uniform User Fee Program**.
- **Decal Program**. Residents purchase decals and display on cars or trailers, valid for a given time period for use of public access.
- **Operator Licensing** as a mechanism for improving education, safety, enforcement and generating funds for facilities.
- **User Permit Fee for Out-of-State Boaters** requiring out-of-state visitors to purchase stickers and signing a release stating they understand New Hampshire boating safety laws.
- **Non-boater User Fee** requesting individuals pay a nominal fee for a special membership sticker allowing that individual to use public access sites.

Another option offered would be to establish a tax advantage to private landowners who provide water access to the public.

**Bureau of Marine Patrol, (1990), *Mooring Regulations SAF-C-408*, State of New Hampshire, Department of Safety, Division of Safety Services, Concord, New Hampshire.**

New Hampshire has developed **special mooring regulations for water bodies with high use** including: Lake Winnepesaukee, Lake Winnesquam, Squam Lakes, Newfound Lake, and Lake Sunapee. Anyone installing, maintaining, or using a mooring in these lakes must have a permit.

**The application for a mooring permit shall:**

- a. Demonstrate that a need for the mooring exists by either supplying **proof of a boat registration** and verifying there are no other safe alternatives for securing the boat.
- b. **Must have legal access over land** to the mooring.
- c. Show that the **mooring will not be sold or leased** except as provided in the section addressing public and congregation mooring fields.

**A \$25 fee is charged** for each permit. A **decals** with a control number will be issued from each approved mooring which shall be affixed to the mooring buoy.

**Moorings are prohibited where:**

- it constitutes a **hazard to public safety** because it interferes with navigation,
- **in combination with other moorings it creates a hazard,**
- it presents **unreasonable adverse environmental effects,**
- it **unreasonably interferes with other recreational uses.**

**Individual Moorings.**

Unless granted a special exception, **no more than one mooring** is permitted adjacent to any shorefront property.

**Special Exceptions** can be granted for the placement of **2 to 4 moorings** adjacent to a shorefront property with the review of the Director of the Bureau of Marine Patrol. Two to four moorings are considered a "small mooring site".

**Public Mooring Fields**

Public mooring fields shall be identified by the Office of State Planning. Each applicant for a mooring in the public mooring field will be assessed an annual fee of \$25. **Fifty percent of the total moorings must not be used for a term longer than 30 days.** The public field shall have at least one public access and an operator. No membership fee can be required.

**Congregate Mooring Field**

Congregate mooring fields contain **five or more moorings**, are dedicated to a **homogeneous group, and require an operator.** A \$25 fee will be assessed for each mooring installed. **congregate permits are not issued unless there is a minimum of 100 feet shore front.** The proposed moorings and attached boats **"may not infringe laterally beyond the Applicant's property lines extended into the water"** and may not extend beyond 150 feet from the shore unless special conditions exist or within 300 feet of a public swimming area.



## Massachusetts

### **Nantucket Harbor Planning Advisory Committee, et. al., (1992), *Nantucket and Madaket Harbors Action Plan - Final Draft*, The Town of Nantucket, MA.**

The Harbors Action Plan is a comprehensive report for Nantucket, Polpis and Madaket Harbors; identifying issues; providing an inventory and analysis of the resource; suggesting goals, objectives and policies; and recommending an implementation program with strategies for achieving desired use patterns.

The issues addressed in the action plan were identified at a public meeting and expanded upon by sub-committees. (Many of the issues of this study are similar to those of Malletts Bay.)

- Water Quality Protection
- Natural Resources Protection
- Commercial and Recreational Fishing
- Harbor Safety, Navigation and Moorings
- Public Access
- Tourism and Recreation
- Downtown Waterfront District

#### **1. Water Quality Protection**

The water quality of Nantucket and Madaket Harbors is degraded through biological contamination, toxic pollution, and excessive nutrient loadings.

##### **Key Recommended actions to protect the water quality include:**

- **Monitor** water quality, and **identify and resolve problems.** Develop a monitoring scheme with weekly records, establish a lay monitoring program, monitor and map waterfowl and sea gulls in concentrated areas, complete quantitative assessment of environmental health and establish policy direction, investigate dredging in areas to improve water circulation.
- **Public Education.** Develop and distribute education materials to boaters and land owners regarding environmental safe practices, and continue to include water quality protection in the school curriculum.
- **Boat Pollution Abatement.** Implement and enforce existing regulations prohibiting pollution from boats; designate both harbors as **no-discharge areas**; **enforce the use of pump-out facilities, provide trash and recycling barrels.**
- **Nonpoint Pollution Control:** Implement and enforce existing rules and regulations that address pollution from land uses around the harbors; enforce hazardous water disposal regulations by waterfront businesses; finalize oil spill contingency plan; adopt new bylaws to minimize residential uses of herbicides, fertilizers, and pesticides; designate critical habitat protection areas.

#### **2. Natural Resource Protection**

Increased overcrowding has led to concern for the protection and preserving of fragile ecosystems, wildlife habitats, and open spaces. **Key recommended actions to protect natural resources include:**

- **Revise the Open Space Plan to require residential and commercial development be sited to protect unique and fragile land forms.**
- **Develop public education materials addressing: environmentally sound construction, maintenance, and storage practices.**
- **Establish performance standards for siting and design of docks and piers.**

- Inventory critical resource areas and existing open spaces; pursue an **open spaces acquisition program**.
3. **Commercial and Recreational Fishing.** Key recommended actions to address fishing:
    - Develop and implement **fish and shellfish management** which includes lab, hatchery, and field management components.
    - Address **public access** needs through a comprehensive program; supply additional dingy docks at the town docks.
    - Investigate the feasibility of a **fishing pier**.
  4. **Harbor Safety, Navigation, and Moorings.** Safety in the harbors is threatened by an increase in boat numbers, overcrowded and substandard moorings, and unsafe boating practices. Key recommended actions to address Harbor safety include:
    - Establish **official mooring fields and anchorages** with the following criteria:
      - larger boats (20' or more) to water deeper than 6' and smaller boats to shallower water.
      - Avoid infringing on federal and local navigation channels and fairways.
      - Designate **overflow anchorage areas** when primary locations are full and set limits on number of boats to avoid safety and health conflicts.
    - Consider **user classifications for moorings and restructure mooring fees** to reflect it.
    - Establish a **Waterways Enterprise Account** with funds from mooring fees, applications, boat excise tax and citations for improvement and maintenance of facilities.
    - Develop a **harbor chart** identifying mooring fields, anchorage areas, channel fairways, and hazards.
    - Develop a **water overlay zone** segregating by place or time the conflicting harbor uses.
    - Enforce **harbor safety laws**.
    - Recommend **mooring tackle in Town Code** and require **inspection** every three years.
    - Revise Town Code to improve safety, control, enforcement, and environmental conditions.
    - Quantify **Harbors Carrying Capacity** by determining the number of moorings that can be handled in relation to protecting multiple-use, natural resources, and high water quality.
    - **Prohibit commercial rentals of jet skis** to minimize use.
  5. **Public Access.** Shoreline development decreases opportunities for public access and increases conflicts over use and maintenance of existing access sites. Key recommended actions for providing public access include:
    - **Require public access on all new or expanding waterfront developments.**
    - Pursue an aggressive **open space and right-of-way acquisition program**. Right-of-way subcommittee should inventory condition of access sites, list and prioritize potential acquisition sites, and research legal status of appropriate street ends on public roads.
    - Provide **signs at all public access sites**.
    - Develop a **coastal access guide and map**, listing facilities.
  6. **Tourism and Recreation.** Tourism and recreation use of the harbors are critical to the economy. Many facilities are lacking, or in need of upgrading or insufficiently advertised. Recommended key actions to encourage tourism and recreation:
    - Develop a "**harbor and water sheet overlay management plan**" to regulate conflicting harbor uses.
    - Implement a **data collection system** to quarterly (seasonally) record recreation uses.
  7. **Downtown Waterfront District.** There is a concern regarding the loss of water-dependent uses to non-water dependent uses affecting historic and visual character. Key recommended actions to address the Downtown Waterfront character:

- Adopt a **zoning bylaw** for the harbor overlay zone.
- Adopt boundaries of a downtown waterfront district to address and promote maritime and related uses and traditional design, and provide **design guidelines**.
- Identify **scenic views** and develop protection policies.
- Provide **incentives for water-dependent uses** of waterfront property.

### Action Plan Implementation.

The existing branches of the Town government should be responsible for much of the plans administration. These branches include: Marine Department, Conservation Commission, Planning Board, Planning and Economic Development Commission and the Board of Health. The report specifies the rates attributed to each board or commission.

Two management strategies of particular interest are covered in further detail:

- **Water Use Classification**
- **Waterfront Overlay District**

### Water Use Classification

The six types of Water Use Classifications are suggested identifying appropriate shoreline development, water surface use, and management policies. **The six types are:**

**Type 1. Conservation Use** areas are for the protection of unique resources. No structural shoreline protection structures or construction of docks and piers are allowed in this area.

**Type 2. Low Intensity Use** maintains scenic and natural habitat values while providing low-intensity recreational and residential uses. Mooring fields should be limited, and private docks, piers, and floats should be discouraged or combined into community docks servicing a minimum of five contiguous waterfront lots.

**Type 3. High Intensity Recreational Use** support mooring fields, anchorages, navigation channels and fairways, and high use recreational boating. Adjoining land uses should include facilities supporting recreational boating and public access.

**Type 4. Multipurpose Use** includes the large expanses of unobstructed water supporting a variety of commercial and a diversity of recreational water-based activities.

**Type 5. Commercial Use** areas are the center of tourism where visual quality is very important. The area is adjacent to waterfront areas that support a variety of tourist, recreational, and commercial activities. Priorities in these areas should be given to servicing, and providing access for recreational craft, commercial fishing vessels and ferries, water dependent commerce, maintenance of navigational channels and fairways, and activities that enhance water quality and scenic and historic qualities.

**Type 6. Navigational Channels Use** areas are federal channels and local fairways. Policies are established to keep these unobstructed of conflicting uses.

### Waterfront Overlay District

The purpose of the waterfront overlay district is to ensure that future development is appropriate to the harbor use and character while encouraging water dependent uses and protecting water quality and critical habitats. The overlay district is to be adopted as **part of the zoning by-laws**. The water front overlay district includes the tidal waters, shoreline features, and areas contiguous to shoreline features **extending inland 200 feet**.

Standards for proposed development within the Waterfront Overlay District include:

- will not interfere with public access of use of tidal waters and shoreline features.
- will not degrade aesthetic and recreational values.
- will not adversely affect water quality, flushing patterns, or accelerate flooding or erosion.
- will not increase stormwater runoff or sedimentation.

- will involve **minimal filling, grading, excavating** or other land alterations.
- will not pose threats to **public health, safety, or property.**
- **all structures** (excluding boat ramps, docks, piers, and wharfs) roads, septic systems, and underground utilities shall be **200' from the edge of tidal waters**, tributaries, wetlands associated with coastal resources, and Type 1 and Type 2 waters.
- **all grading, filling, and excavation** shall be kept 100 feet from tidal waters except for water-dependent activities or structures.

## New York

### Task Force for the Future of the Lake George Park, (1987), *The Plan for the Future of the Lake George Park*, Lake George, NY.

This report is a “**strategic plan**” for accomplishing specific objectives involving management of land resources, production of critical environmental resources, urban realizations, public land management and acquisition, water quality management, lake level management, and management of water-based recreation. This review will focus on the last area of management, water-based recreation as most relevant to the Malletts Bay Recreation Management Plan.

Lake George, located in eastern New York State within the Lake Champlain Basin, is “**one of the most intensely used water bodies in the United States**” and is also the drinking water supply for thousands of people. In the chapter on the management of water-based recreation, the task force identifies and proposes legislative and administrative solutions to the following issues: public access, boating, marinas and rental vessels, docks and moorings, anchoring, special vessel regulation zones, swimming, fishing management, unconventional vessels, and antique activities, and winter use impacts.

#### Public Access

A large portion of the shoreline is owned by the State, however, existing **access opportunities are limited to largely through commercially-owned facilities.** The Task Force supports the development and enhancement of public access facilities in a sensitive manner to avoid adding to existing management problems.

#### Boating

Lake George has the **highest number of boating accidents** of any location in New York State. Congestion, noise, and safety problems seriously detract from the recreation experience. However, the levels and types of use varies significantly around the lake with some concentrated “**hot spots**” and peak times. **Conflicting and inconsistent State and local laws compound enforcement problems.**

#### Key recommendations for boating:

- The Commissioner of Environmental Conservation should **delegate authority** for administering the Navigational Laws at Lake George to the Lake George Park Commission.
- **Closer coordination and communication** needed between the Departments of Environmental Conservation and Parks, Recreation and Historic Preservation.
- Lake George Park Commission should conduct studies to **establish the lake's capacity** to accommodate more (or less) boats of particular types and sizes relative to shoreline facilities and resource management.
- A committee needed to determine **noise standards and methods of measuring.** Rules have been adopted which does not allow vessels which exceed 86 db measured at 50 feet or 80 db measured at 100 feet from the vessel.
- Start enforcement of the State's **drunken boat driving law** needed as alcohol abuse is

involved in 75% of all boating accidents nationwide.

- **"No wake" zones** should be established in bays and narrow channels to prevent accidents, erosion and damage to the shoreline structures. Buoys should mark the zones.
- Establish a **45 mph daytime speed limit and 25 mph nighttime speed limit lakewide.**
- Develop a **financial plan** to address enforcement including State appropriations and user fees.

### Marina and Rental Vessels

Extensive numbers of commercial establishments and private residences which rent boat slips and moorings function illegally without permits as enforcement staff is limited. The recent establishment of rack storage facility for motor boats are, as yet, unregulated.

### Key recommendations:

- The Department of Environmental conservation should **delegate responsibility** for administer marina regulations to the Lake George Park Commission.
- Standards for marinas should require **"sizing" of facilities to match the number of boats** accommodated. **Rack storage regulations** regarding type and size should be developed. Existing **illegal marinas should not be grand fathered.**
- Marinas should be **inspected annually**, requiring annual renewal of the State permit.
- Marina permits **fees** should be on a **sliding scale** depending on **size of operation.**
- Marinas and/or day storage racks with **25 or more boats** should be subject to **local site plan review.**

### Docks and Moorings

Through the Public Land Law, **public lands under water are leased to upland owners for the development of substantial docks and wharves.** They are also required to obtain a permit from the Department of Environmental Conservation, the Town, and the U. S. Army Corps of Engineers. The extent of lake **frontage is used to determine allowable number of docks:**

100'	= 1 dock
101'-250'	= 2 docks
251'-500'	= 3 docks

Docks are generally **not** permitted to extend further than 40' offshore from the low water mark nor measure more than 700 square feet. One mooring is permitted per upland parcel, but no further than 100' from the shoreline.

Commercial lots are allowed four moorings for up to 500 feet of shoreline plus one mooring for every 100 feet beyond 500 feet. "Privately zoned" lots are allowed mooring numbers based on the same ration as docks limited above.

Local government may regulate moorings and anchoring within 1,500 feet of the shoreline.

### Key Recommendations regarding docks and moorings:

- DEC should **delegate authority** to the Lake George Park Commission.
- Non-commercial properties should **not be granted mooring permits** except for use of his/her own boat.
- Dock permits should **require well maintained facilities.**
- An annual fee system should be established.

### Anchoring

Generally, boats may be anchored anywhere, following safe boating rules and common courtesy.

**Key Recommendations:**

- Anchored vessels should be discouraged at distances less than 200 feet from end of docks or shoreline.

**Swimming**

Swimming is a **primary use of Lake George** with more people partaking in this activity than any other water-based recreational activity. Localized water quality is a concern due to storm water contamination, sewage spills and leaks, and extensive waterfowl dropping. The dumping of sand to create beaches covers natural plant and fish habitat.

- **More beaches and parks are needed.**
- Steps need to be taken to **mitigate water quality at beaches.**

**Fishing Management**

Lake George offers some of the best fishing in the State for land-locked salmon and lake trout.

**Key Recommendations:**

- Ensure adequate protection and regulations to maintain fishing.
- Promote a **catch and release philosophy** for lake trout and landlocked salmon.
- **Trolling boats** should display a flag requiring other boats to stay 200' clear.
- Develop several **additional public fishing access sites.**

**Unconventional Vessels and Unique Activities.**

- Educate **divers** on the law requiring a permit for exploration of archeological remains that it is a felony to remove artifacts.
- Specific safety regulations needed for **parasailing** regarding spotters, number of sails at a time, inspection of equipment.
- **Permitters should prominently notify public of all regattas;** boat clubs should **coordinate events;** DEC should **delegate authority** to permit regattas to the Lake George Park Commission.

**Winter Use Impacts**

Lake George is a **year-round resort.** winter use impact includes trash and fluids from motorized vehicles, compaction of snow along shoreline damaging vegetation and increasing erosion. Unmanaged ice fishing can impact water quality. Lake George **Winter Carnival** impacts on water quality should be identified and minimized.

**Two restricted use zones** have been established at Lake George to "prevent overcrowding and congestion, reduce noise, protect public health, safety and welfare, and preserve the resources of the Park.

1. Sandy Bar is a restricted use zone with the following regulations:
  - The Commission may place up to 60 mooring buoys, placed so that no vessel will come within 200 feet of the mean high water mark.
  - **No mooring or anchoring permitted except at a mooring buoy established by the Commission.**
  - **No vessel should be moored after sunset or before sunrise,** be beached on the shore (excepting by owner on that person's property).
2. Paradise Bay is a restricted use area with the following regulations:
  - **No vessel shall be anchored or moored at any time** excepting for emergency purposes or to use the docks established by the Department. This provision **does not apply each year from September 15 through May 15 of the following year.**

## Delaware

Falk, James, Alan Graefe, et. al., (1992), *Recreational Boating in Delaware's Inland Bays: Implications for Social and Environmental Carrying Capacity.*, prepared for Inland Bays Estuary Program. Delaware Department of Natural Resources and Environmental Control, Division of Water Resources, DEL-SG-19-92, University of Delaware, Newark, Delaware.

This study evaluates recreational carrying capacity for inland bays in Delaware, considering various social and environmental factors. The data collected provided a broad overview of boaters using the bay. Some of the more important data relates to perceptions of boaters about their boating experiences and attitudes to potential boating regulations. If resource managers determine additional regulations are needed, the study provides boaters' opinions about certain measures. The data also can be used as a basis for establishing "quantitative" standards of acceptability for a wide range of potential social and environmental indicators. A monitoring program would need to be implemented to measure the effect of management alternatives on the quality of the boating experience.

The study also evaluates the relationship between cause (boater use) and effect (the impacts on either the environment or the boating experience.) The stronger the relationship the better the estimate for carrying capacity. For example, the study found a weak relationship between use levels and quality of the boating experience. However, there was a strong relationship between certain objectionable boater behaviors (such as boaters coming too close) and the quality of the boating experience. This information suggests that limiting the number of boats on the bay would have little effect on the boating experience as the problem is due to behavior patterns. Therefore managers should focus on education and enforcement to improve behavior patterns.

Monitoring should focus on the indicators that proved most critical in the study. Potential indicators should be evaluated for frequency of occurrence, correlation with boat density, and correlation with the satisfaction index. If an indicator has a strong relationship with any of these criteria, it should be included in future monitoring.

Important indicators for this study include overall trip rating, perceptions of crowding, displacement of boaters to other time, place and/or activities, and perceived safety. Future monitoring should also include measures of boat density, use patterns, and accident statistics. Environmental quality monitoring should be initiated in conjunction with boating quality monitoring to determine relationships between the two. Water turbidity is an easily monitored environmental indicator.

Management Recommendations of the study include:

### Policy Issues

- Balance maximizing use of the bay and preservation of environmental quality.
- Determine if priorities in planning should be given to certain user groups.
- While crowding is not an existing problem, there are "hot spots" that should be monitored for future safety and environmental concerns.
- The majority of respondents favored zoning bay water, which should be considered an option if resources or user conflicts are evident.
- Priorities for boating accesses should be given to launch ramps over marinas, based upon

user preferences, current number of marinas, and environmental impacts of marinas.

- Long-term monitoring of boating activity and perceptions should be conducted to review management effectiveness and in changes in environmental or use patterns.

#### Enforcement

- Respondents indicate a desire for **increased enforcement**. Review current enforcement and determine whether increases are warranted.
- **"Hot spots"** on heavy days should have increased enforcement to maintain a safe experience.

#### Boating Safety

- All relevant organizations should **strengthen boater safety education efforts**.
- Monitoring where **high speed boats create wakes** near anchored vessels.
- **Jet skiing problems** associated with renting rather than owners. Education and legislation should address.

#### Environmental

- If environmental officials determine **larger boats and engines cause greater damage**, action should be taken to **control boats and engine size** in the bay.
- Criteria needed for assessing sensitive habitats and resources as **off-limit zones**.
- Boating activity should be **restricted in excessively shallow waters** to protect near-shore habitats.
- Support the creation of **greenways** to protect against further development and provide additional public access.

#### Education and Awareness

- Additional **education** about shallow areas, erect signs to mark navigational channels
- Consider **distinct user groups and their education needs**
- **Educational displays needed at key locations** regarding behavior to minimize conflicts and impacts on resources
- **Create a focus and stronger sense of personal ownership** and pride on part of the users.  
Ex., "Delaware Inland Bays: A National Estuary"

### Arizona/Utah

#### **National Park Service, Rocky Mountain Region, (1987), *The Carrying Capacity of Lake Powell: A Management Analysis of Capacity for Boater Recreating, Glen Canyon National Recreation Area, Arizona/Utah.***

This study is unique, as many **carrying capacity studies** have been conducted for land and rivers, but very few are available for **flat water recreation** areas which consider the physical, resource, and social limiting factors; and fewer still offer a means of **quantifying capacity**.

This study evaluated and collected information on lake activity, factors affecting boating distribution and resource impacts to arrive at a **"boats-at-one-time" use limit** allowable in zones on the lake. The study identifies the **most limiting factor in each zone**, determines the **zones capacity** and apportions the limit among the relevant marinas. Boaters access to Lake Powell is almost exclusively through developed marinas, allowing the ability to directly manage boat numbers and distribution through marina launch capacity.

The study also identified management strategies for **mitigating the most limiting factor and, thereby, increasing the lake's capacity**.



To be useful, **limiting factors** must:

- be quantifiable,
- lend themselves to monitoring,
- illustrate direct relationship between levels of visitor use and the quality of the recreational experience or deterioration of natural resources.

The limiting factors which are key to evaluating recreation experience and impact of user density for Lake Powell were identified as:

- the presence of trash and human waste on the shore,
- noise from other recreationists,
- water quality,
- physical space/shoreline sites (as most visitors camp overnight on shore, and the usable shoreline is limited),

**Social carrying capacity** was incorporated by determining maximum densities of boaters which still allowed the **realization of expected quality of recreation experience**.

**Safety:** The study selected 9 acres of open surface water/boat as a guideline for safe boating on open water and applied as a density limit to determine the maximum number of boats allowed at one time in a zone. **(The 9 acre/boat limit is not substantially justified in the study.)**

A matrix of limiting factors was developed identifying the **most limiting factor by zone**. **Water quality and shoreline impacts due to trash and human waste were the most limiting factors** for 9 out of 13 zones. Management of boating use within the carrying capacity limits set by the most limiting factors can be achieved through design of the marinas (determining marina launch rates) and their location and distribution.

**Monitoring** of the condition of Lake Powell should be conducted every 5-7 years to determine: distribution patterns, activities, water quality, and shoreline impact.

## Review of Relevant Programs

This section reviews federal, state, and local programs offering technical, advisory and/or funding assistance relevant to the Malletts Bay Recreation Management Plan.

### Water Quality

#### Federal Water Quality Programs

(information primarily from Zwick Associates, et. al. *Vermont Lakes and Ponds Recreation Management Study*.)

**Clean Water Act - Section 314.** This legislation established the **Clean Lakes Program (CLP)** aimed at controlling pollution entering publicly owned freshwater lakes and required states to develop comprehensive water management programs. **Financial assistance is channeled to the State through four types of cooperatives agreements:**

- **Lake Water Quality Assessments** requiring states to list and rank threatened or impaired lakes. The federal government provides 50% funding.
- **Diagnostic/Feasibility Studies** for determining pollution causes, potential solutions and restoration strategies. The federal government may fund 70% of a study with a \$100,000 cap per study.
- **Implementation** funds may be awarded for lake restoration or implementation with management strategies requiring a 50% match from State or local sources.
- **Monitoring** grants up to \$125,000 with a 30% non-federal match, can be provided for evaluating effectiveness of restoration techniques.

The U. S. Environmental Protection Agency administers the Clean Lakes Program and distributes grants to the Vermont Department of Environmental Conservation.

**Clean Water Act of 1987 - Section 319 requires states to: determine non-point source pollution of surface and ground waters and to develop management plans to address the identified problem.**

Section 314(h) provides funding for enforcement, education, technology, technical assistance and monitoring for implementing the **nonpoint pollution source programs**. The Water Quality Division of the Vermont Department of Environmental Conservation administers the **Nonpoint Pollution Source Program**. **Land and Water Conservation Fund** provides financial assistance for acquisition and development projects. The fund is administered by the U. S. Department of the Interior and the Vermont Department of Forests, Parks, and Recreation administer the program in the State. **Local communities, special districts, and state agencies may receive grants, requiring a 50% match, for acquisition of lands for recreation and facility development or improvement projects.**

#### State Water Quality Programs

(compiled largely from *Vermont Lakes and Ponds Recreation Management Study* and *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin*.)

**Vermont's Lakes and Ponds Program** provides the underlying structure for lakes and ponds water quality management including the following sub-programs:

1. **Monitoring and Surveillance**
  - a. Spring Phosphorous Program
  - b. Lay Monitoring Program
  - c. Aquatic Plant Survey Program
  - d. Cooperative Bacteriologist Sampling Program
  - e. Acid Precipitation Program
  - f. Long-Term Lake Monitoring Program
2. **Special Studies**
  - a. Monitoring programs
  - b. Public education programs
  - c. Regulatory programs
  - e.g. Vermont Water Quality Standards.

The Water Quality Division of the Department of Environmental Conservation administers the Vermont's Lakes and Ponds Programs.

### **Water Pollution Control.**

Control of point source water pollution occurs mostly at the State level. Vermont Statute 10 V.S.A. Chapter 47 prohibits the discharge of any waste, substance, or material into the waters of Vermont without meeting specific requirements and obtaining a permit. Section 1266a specifically addresses wastes containing phosphorous, establishing a **Lake Champlain basin-wide phosphorous limit of 0.8 mg.** applicable to all discharges greater than 200,000 gal/day. (ex. emptying aerated lagoon treatment facilities).

Funding phosphorous monitoring of Lake Champlain and tributaries has been through the Lake Champlain Basin Program in cooperation with Vermont's and New York's Departments of Environmental Conservation.

**Control of nonpoint source pollution** has been through **voluntary federal programs** with financial assistance from the USDA Agricultural Stabilization and Conservation Service (ASCS) and the USDA Natural Resources Conservation Service (NRSC). Under the **Vermont Agricultural Nonpoint Source Program**, the Vermont Department of Agriculture has recently revised their **Accepted Agricultural Practices (AAP's)** and expect adoption in late 1994 making the practices enforceable under State laws. Two other components still being formulated, of the program will include:

- **income tax credit incentives** for voluntary application of specific practices beyond the required AAP's, and
- **State cost-sharing** for voluntary implementation of Best Management Practices (BMP's) in targeted watersheds.

**Vermont State Stormwater Control Program** administered by the Department of Environmental Conservation "lacks some requirements now common in State programs in some other parts of the country". *Opportunities for Action.*

The Vermont Department of Environmental Conservation administers the **Lake Champlain Lay Monitoring program** which has been very effective in educating the public on supplying needed base information on the Lake's water quality.

### **Town of Colchester Water Quality Programs**

The Town of Colchester has been administering a water quality monitoring program for Inner Malletts Bay since the summer of 1990. A Water Quality Coordinator is hired by the Town to

administer the water sampling and compile the results. Samples are taken three to four times weekly at Bayside Beach, and twice weekly at 12 other sites, and analyzed for fecal coliform.

The **Sewer Study Steering Committee** is actively investigating the need and public acceptability for sewer systems. The citizen's group in conducting a survey of the residents this fall.

## Aquatic Nuisance Control

The **Aquatic Nuisance Control Program** - 10 V.S.A., Chapter 37, Section 921, was established to control plant, algae, sediment and other aquatic nuisances that interfere with the recreational use of Vermont's lakes and ponds. The program has focused on the control of Eurasian milfoil and Water Chestnut. The **sea lamprey control program** has shown effectiveness in managing the impact the sea lamprey on the land locked salmon population. During 1993 the Department of Environmental Conservation began **monitoring zebra mussel** infestation and effects and have established a "**mussel watch**" program.

## Wetlands Protection

**Lake Champlain Wetland Acquisition Strategy**, sponsored by the Lake Champlain Basin Program identifies highest quality wetland sites in the Champlain Valley, one of which is Malletts Creek. The regional chapters of the Nature Conservancy will coordinate the acquisition project and the U. S. Fish and Wildlife Service administers the funding.

## Fish and Wildlife

The Vermont Fish and Wildlife Service joined forces with the New York and U. S. Fish and Wildlife Services to establish the **Lake Champlain Fish and Wildlife Management Cooperative** with a primary goal to develop and maintain a diverse salmonid fishery in Lake Champlain. The Vermont Fish and Wildlife Department manages State fish hatcheries and wildlife manages a state-listed threatened and endangered species effort, and sets game harvest regulations.

The **Natural Heritage Program** maintains inventories of rare plants, rare animals, and natural communities of ecological significance. The program also surveys, protects, and teaches about endangered species and the State's significant natural areas.

## Boat Safety

U. S. Coast Guard and State Police conduct "**courtesy boat inspections**" for compliance with safety requirements including registration, personal flotation devices, fuel storage, and fire extinguishers.

Vermont boating regulations require anyone born after 1 January 74 to take the **Boater Safety Course** to operate a vessel with a motor over 6 horsepower. The **Boater Safety Education Program** is administered by the Department of Public Safety, State Police and the course is conducted by the U. S. Power Squadron.

The Town of Colchester has implemented a **Harbormaster Program** with an appointed Harbormaster whose duties are to "emphasize safety, boating courtesy and the control of health hazards." The responsibilities of the Harbormaster include enforcement of boating statutes, identifying safety hazards, monitoring solid and liquid wastes in the bay, and coordinating

town and state officials responses in emergencies, accidents, and disasters. The Harbormaster also is responsible for an inventory of docks, moorings and slips and the designation of swimming, anchorage, mooring, fairway, and commercial areas.

## Access

The Vermont Fish and Wildlife Service establishes and maintains **Fish and Wildlife boat accesses**. Existing Fish and Wildlife accesses, providing access to Malletts Bay, directly or indirectly, include:

**paved access accommodating larger boats:**

- Malletts Bay Access on Lakeshore Drive, Lamoille River Access, and Windemere Way Access on the Winooski River.

**gravel launch ramp for small boats:**

- Sand Bar State Park and

**car top launching:**

- Heinenberg on the Winooski River (composed of three parcels owned by the Town of Colchester, Vermont Fish and Wildlife, and a private property).

According to Joe Healy at the Essex Junction office, **no additional Fish and Wildlife boat launch accesses are planned on Malletts Bay at this time**. John Anderson who manages fisheries, including the Malletts Bay, would like to see an access site at the railroad causeway and at the State Park.

## Recreation

Vermont Department of Forests, Parks and Recreation has developed a plan for the **Malletts Bay State Park** to include pedestrian and visual access to the waterfront. At this point no date is set for implementation of the plan.

The **Town of Colchester Parks and Recreation Department** conducts an extensive recreation program at Bayside Park including swimming classes, day camp, tennis class and soccer camp. The High School physical education program and St. Michael's College use the park for canoeing classes.

The Town of Colchester has developed plans for a **recreation path** starting at Airport Park, through the Colchester Bay and extending out the causeway. For now the plans stop at the "cut" awaiting resolution of a "ferry" system to make the crossing.

The **Colchester Land Trust** has been looking into the feasibility of acquiring Thayer's Beach for a park, beach, and access site.

Recreation planners from New York and Vermont and the U. S. National Park Service, along with many active citizens, private organization and a tourism committee from Quebec, have been conducting groundwork for a **Lake Champlain Bikeways** to provide and promote bicycling access around the Lake.

An effort is underway to establish a **Lake Champlain Paddlers Trail** for canoes and kayaks. The Champlain Kayak Club, Northern Vermont Canoe cruisers and the Lake Champlain Committee have formed a partnership to explore the issues and potentials for the trail.

## Shoreland Redevelopment/Tourism

The **Town of Colchester Lakeshore Redevelopment Committee** vision statement is:

"The goal of Colchester's Bay Project is to improve the quality of life (environmental, economic and recreational) centered at the Malletts Bay/Lakeshore Drive area, by improving the Bay, access to the Bay and activities at the Bay. The vision of the Bay Project will include an improved and revitalized Lakeshore Drive in a "New England Village" style and a "BAYWALK" along a new retaining wall in the Bay. Bike paths extending from Exit 16 (through "Camp Johnson") and the business district, through the Bay and "New England Village" section to a new environmental protection area encompassing the Colchester Bog, Sand Plain and Winooski River, will connect Colchester to Burlington's bike path. Sidewalks, increased entertainment, artistic and recreational activities focused at Bayside Park are integral to the plan.

Key to this vision are:

- pre-determined design standards and pro-active zoning and planning policies to enable developers to build quickly while strictly adhering to the "Village" concept (a variety of building spaces is desired, including shops, restaurants, offices as well as limited residential development to insure year-round vitality);
- sewage service to the entire Malletts Bay and Lakeshore Drive areas;
- reconstruction of Lakeshore Drive and Malletts Bay Avenue, including a retaining wall with "Baywalk";
- designation of a new environmental protection area;
- re-design of Bayside Park to include a vastly improved beach area and a lakeside amphitheater;
- a commitment to sidewalks, bike paths, access and cooperation;
- and coordination with the Lake Champlain Management Recreation Plan for Malletts Bay."

**State Shoreland Zoning Act** - have requested information, will be reviewed when received.

See review of **Town of Colchester Zoning By-Laws** in "Review of Relevant Studies" section.

## Education

Lake Champlain Basin Program has developed numerous education programs including the Champlain Basin Education Initiative to provide teachers with innovative tools to educate about Basin issues and solutions. In 1991, the **Education and Outreach Advisory Committee** was formed and developed a comprehensive education program. Many educational materials have been developed and distributed including a quarterly newspaper, slide show, fact sheets, zebra mussel identification cards, brochures, field guide of educational organizations in the Basin, and annual progress reports. The LCBP conducts presentations, workshops, and celebrations as part of their education efforts.

Colchester High School teachers, Bill Ramond and Betsy Orselet, have developed a high school curricula focused on the environmental issues of Lake Champlain. As part of the program the students conduct field studies on Malletts Bay.