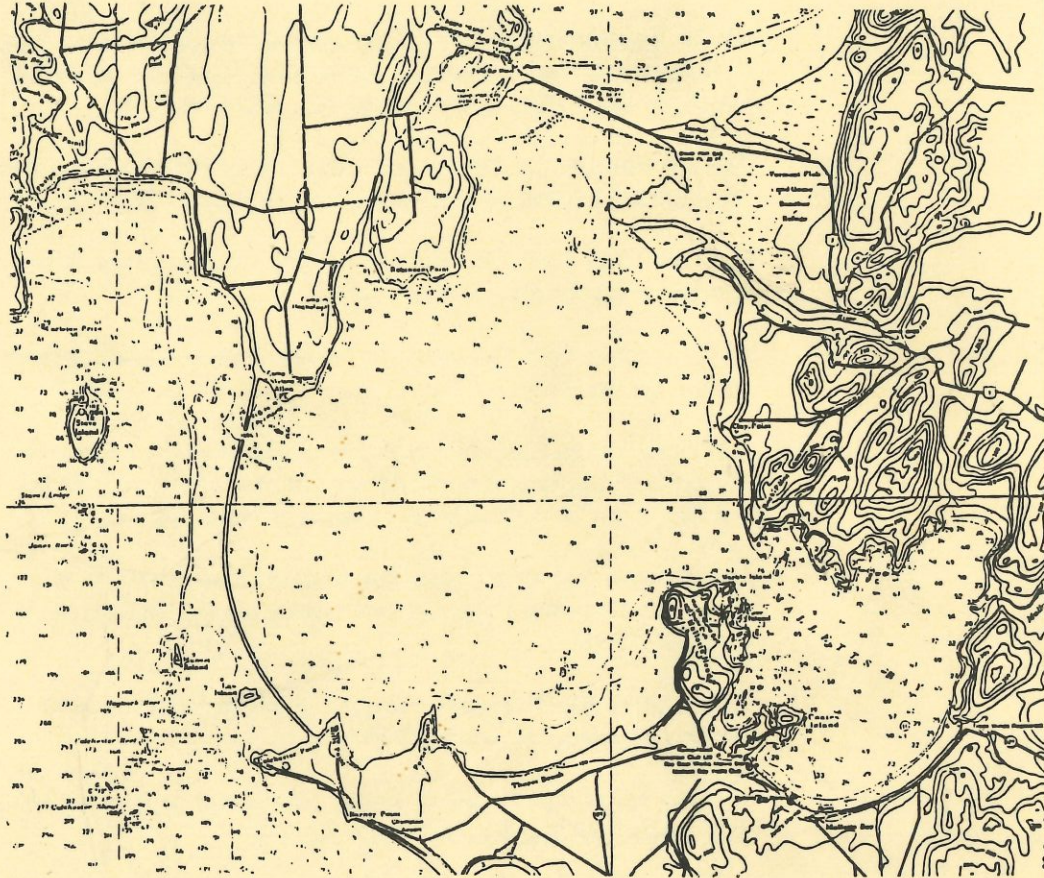


Malletts Bay Recreation Resource Management Plan

**Lake Champlain
Basin Program**



Prepared by
T.J. Boyle and Associates,
Resource Systems Group,
Associates in Rural Development,
and Engineering Ventures

for
Lake Champlain Management Conference

October 1995

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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The Malletts Bay Steering Committee worked diligently through the process of developing this Recreation Management Plan by reviewing countless documents and reports, gathering and checking data, and participating in numerous night meetings. This document is a small representation of their tremendous effort.

Malletts Bay Steering Committee:

John Brisson Brian McNeil
Paul Brown Michael Morin
Andy Cochran Lee Rascoe
Peter Hill Thomas Soules

Town of Colchester:

Thomas Berry, Town Planner
David Timmons, Town Manager

We would also like to acknowledge the significant coordination, review, and information supplying efforts and attending many night meetings of Susan Bulmer, Maja Smith and Greg Farnum of the Vermont Agency of Natural Resources, Department of Forests, Parks and Recreation.

Forward

Development of the Malletts Bay Recreation Resource Management plan was a cooperative venture between:

Vermont Agency of Natural Resources, Department of Forests, Parks, and Recreation

Town of Colchester, Vermont

Vermont Water Resources Board

Consultants:

Jane Sorensen, Project Leader, T. J. Boyle and Associates

Robert Chamberlain and Judy LaFavor, Resource Systems Group, Inc.

Lenore Budd, Associates in Rural Development, Inc.

David Boehm, Engineering Ventures, Inc.

The Management Plan has been reviewed and accepted by the Technical Advisory Committee and accepted by the Lake Champlain Basin Program as a Technical Report.

The Management Plan has not been officially approved by the Town of Colchester at the time of this writing.

Vision Statement for Malletts Bay

The first step in developing a recreation management plan is to define an overall vision to serve as a guide in policy formation and management decisions.

Malletts Bay is envisioned as a high-use area of Lake Champlain which supports a diversity of recreation uses in a manner which is safe and pleasurable. The recreating public will be knowledgeable and respectful of each other's needs and limitations, the "rules of the road," and of the rights of private landowners. The natural resources will be managed to ensure healthy drinking water, safe water-contact activities, and minimized impact on natural habitats for continued social and environmental benefits. The recreating public and the private landowner will enjoy a scenic setting highlighted with facilities that encourage and accommodate their activities. Public and private shoreline facilities will provide adequate access and services for the diversity of year-round uses.

Recreation Management Goal

The goal of the recreation management plan is to provide a tool for managing Malletts Bay and its shorelines for a diversity of recreational uses while conserving its natural and built resources.

Malletts Bay Study Area

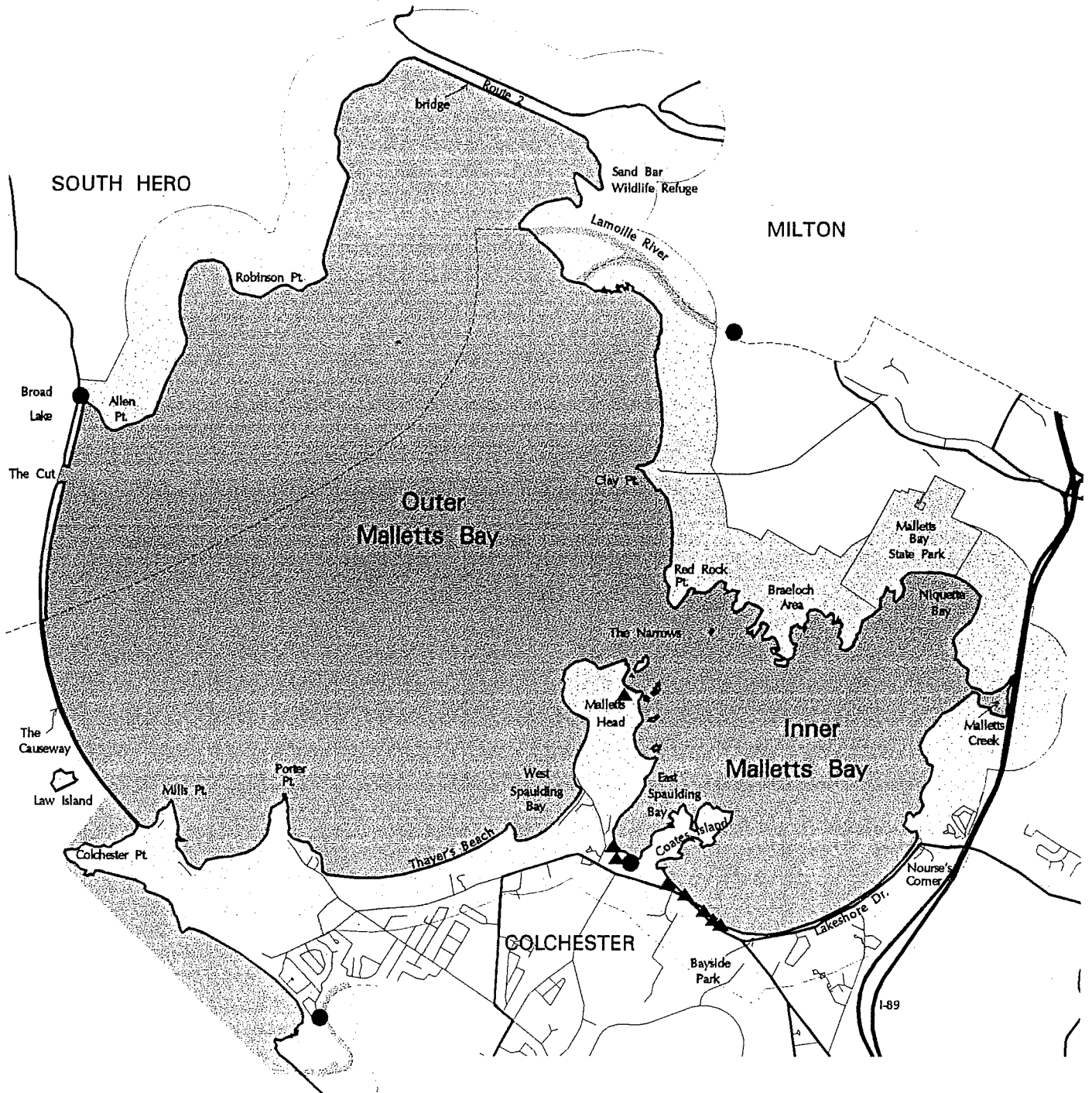


Figure 1

RD/GIS
Associates in Rural Development, Inc.

- ▲ marina
- Fish & Wildlife access

Executive Summary

Project Objective

The objective of the Malletts Bay Recreation Management Plan project is to determine how the public waters of Malletts Bay can be managed in the best interest of the citizens of the State. The resulting recreation plan will be utilized by the Town of Colchester to manage and regulate recreation use of Malletts Bay.

Project Process

The Malletts Bay Recreation Management Plan is to be developed as two phases. This report reflects Phase One which includes three steps: Inventory and Assessment, Analysis and Recommendations, and Policy Formation. Phase II will involve two steps: Decision Making Model Development and Implementation.

Phase One: Inventory, Assessment and Policy Formation

1. **Inventory and Assessment** involved several information gathering studies of Malletts Bay including:
 - **Natural and Built Resource Inventory:** Mapping of resources on Geographic Information System (GIS) from existing databases.
 - **Institutional Review Analysis:** Documenting the federal, state and local laws, policies, rules and authority for Malletts Bay.
 - **Review of Relevant Studies:** Reviewing all relevant federal, state and town plans, studies, reports, and programs to determine the impacts of findings, recommendations and actions on Malletts Bay.
 - **User Survey, Use Counts, Public Attitude Survey, and Key Informant Interviews:** Conducting intensive user survey on six days through the Fish and Wildlife Fishing Access, at Marinas, and from shoreline residents. A total of 552 surveys were completed. Use counts were conducted through fly-overs in morning and afternoon of each survey day. A general attitude survey was conducted by telephone of 83 Chittenden County residents. Eighteen key persons in Malletts Bay representing various recreation groups, local businesses, and grassroots advocacy groups, were interviewed.
 - **Public Informational Meetings:** A series of ten Public/Steering Committee Meetings and Workshops were conducted throughout the planning process.
2. **Analysis and Recommendation** involved developing a **Recreational Use Analysis** summarizing the results of the Inventory and Assessment and forecasting the recreational and facilities needs and potentials.
3. **Policy Formation** involved making recommendations to address the issues and opportunities identified in the Inventory and Recreational Use Analysis, and developing **Management Objectives and Strategies** and an **Economic Analysis** evaluating their economic impacts.

Phase Two: Decision Making and Implementation Techniques

Phase Two is dependent upon future approval and funding and will include two major steps:

1. **Decision Making Model Development:** A computer model to allow analyzing how a change in one variable or strategy could impact others.
2. **Implementation:** The development of a Harbor Improvement Plan and recommended revisions to Town plans, regulations, and programs and Rules adopted by the Water Resources Board.

Framework for the Management Plan

The project development has been closely guided by a **Steering Committee** composed of eight community members and the Town Planner representing a diversity of recreational, commercial, and shoreline resident interests.

The process of developing a recreation management plan for Malletts Plan is based in part upon the Visitor Impact Management planning framework through which we explore recreational carrying capacity, not as a fixed number, but as a correlation of social perceptions and physical constraints, to determine unacceptable impacts.

Study Findings

Typical Mix of Activities and Boats in Use on Malletts Bay

Touring, sailing and fishing make up the majority of boating activity on Malletts Bay. However the Bay accommodates a diversity of other recreation types including water skiing, nature enjoyment, swimming, paddling, personal watercrafting, scuba-diving, windsurfing, and rowing. Motorboats are the leading category of boat type used in the boating activities, accounting for two-thirds of the total, with sailboats making up nearly a quarter. Canoes, kayaks, windsurfers, personal watercraft, and others make up the remaining 10%. Over half of all boats are 21 feet in length or less, while 39% are 22'-32' in length, leaving 8% in the greater than 33' size class.

Typical Number of Boats in Use on Malletts Bay

The data indicates that an average peak hour usage on weekends is two to three times greater than that of weekdays. The data also shows that the busiest boating hour of any given week is likely to be 2:30 p.m. to 3:30 p.m. on a Saturday. On a typical Saturday on Malletts Bay, we would anticipate a maximum number of boats active during any one hour to be around 170, and a cumulative number of 400 boats for the day.

Existing Recreation Use Areas and Mixes

All areas of Malletts Bay are utilized at some point of the day on busy summer weekends. The central part of the Outer Bay is the area where 24% of respondents spent the most time. The central part of the Inner Bay was reported by 16% of respondents as the area where they spent the most time. Nearly 14% of respondents spent most of their time outside of Malletts Bay in the Broad Lake. The north shore of the Inner Bay is popular for a diversity of uses identified by 12% of respondents as the area where most time was spent. In the Outer Bay, Thayers Beach is a common destination for motorboats, both from within Malletts Bay and from the Broad Lake, who will anchor in the shallow waters, swim and picnic on their boats. Existing winter recreational use areas, include the southern shore of the Outer Bay, popular area for ice fishing, as are parts of the Inner Bay. Snowmobilers travel all over the bay mostly accessing from the southern shore and both the Inner and Outer Bays. Ice skating occurs when conditions are suitable, often in East Spaulding Bay.

Existing Access and Navigation Patterns

The number of boaters accessing the Bay is evenly split between the marinas, the Malletts Bay Fish and Wildlife Access, and from private shoreline property. East Spaulding Bay, which includes the Public Fish and Wildlife Access Area and two marinas, was recorded as the most frequent beginning location of trips, followed by the area east of Coates Island where the remaining marinas are located. Seventy-five percent of boat trips begin in the Inner Bay while over 55% of respondents reported areas of the Outer Bay or the Broad Lake as where they spent the most time. Major patterns of navigation are from the East Spaulding Bay and East of Coates Island areas through the Narrows and splitting into three primary direction, straight to the Cut to access the Broad Lake, sweeping south to Thayers Beach (mostly motorboats) and dispersing throughout the Outer Bay. Most winter recreationists gain access via private property in Niquette Bay and off Porters Point. The Fish and Wildlife Access Area does allow winter access, however the general pattern of ice ridges in the Narrows often renders travel to the Outer Bay dangerous or impossible.

Issues, Objectives, and Management Strategies

Boating Conflicts and Safety Concerns

Issue Description: Approximately 20% of survey respondents reported having a conflict with other users of Malletts Bay. The most prevalent conflict reported was between motorboaters in regard to boating courtesy and obeying the "rules of the road". Problems with personal watercraft were the second most reported conflict expressed by all types of boating groups and shoreline residents. The greatest number of conflicts (34%) were reported to occur in the Narrows between the Inner and Outer Bay while the central area of Inner Bay accounted for 17%.

Management Goal: Minimize conflicts among recreationists and maintain the highest degree of safety among bay users.

Key Indicator Standard: Achieve a level of 15% or less of survey respondents reporting a conflict or problem with other users of Malletts Bay.

Monitoring: A standardized user survey and use count should be conducted every year to monitor boating conflicts.

Management Objectives

1. Develop public education on boating safety and courtesy.
2. Provide management strategies that specifically address high conflict locations.
3. Improve consistency and coordination of enforcement.
4. Separate conflicting uses by space and/or time when possible.
5. Increase regulation as a last resort.

Management Strategies

1. **Public Education: Boating Rules and Courtesy**
 - a. Post, distribute, and broadcast public education posters of simplified boating rules and courtesy.
 - b. Annual social events where participants of different recreation activities can meet each other.
 - c. **Public Education: Empowering Citizens to Speak Up**
 - 1) Create a Malletts Bay Watch Program.
 - 2) Encourage direct communications between citizens.
 - 3) Sponsor a letter-writing campaign to personal watercraft manufacturers to improve mufflers.
2. **Conflict Hot Spots: The Narrows and the Central Area of the Inner Bay**
 - a. **The Narrows:** Conduct a well publicized and monitored temporary installation of navigational buoys by the Coast Guard. If effective, consider permanent installation.
 - b. **The Central Area of the Inner Bay:** A combination of management strategies of dispersing access, public education and separating uses by time and space are proposed to address the conflict and safety concerns of the central area of the Inner Bay (discussed in other sections).
3. **Enforcement:** The Coast Guard has initiated a number of meetings with the enforcement entities on Lake Champlain to coordinate efforts.
4. **Separating Conflicting Uses by Space or Time**
 - a. The 200' distance requirement is an existing regulation.
 - b. An area for water skiing has already been designated.
 - c. Identify an area for personal watercraft "stunt riding."
 - d. Improved public education suggesting no anchoring, fishing or water skiing in the Cut during busy weekends.

Perceived Crowding

Issue Description: 62% of survey respondents perceived crowding. A recreation planning standard of 65% perceived crowding or greater is a capacity limit. According to the 65% benchmark, this response of 62% of respondents reporting perceived crowding signifies a problem. The actual locations with high levels of perceived crowding has direct relevancy for managing recreation use. The central area of the Inner Bay, East Spaulding Bay and the Narrows each were the areas most frequently identified as crowded. The issue of perceived crowding should not be viewed in isolation. The implications are that strategies for management should go beyond simply freezing in time the number of boats and activity, but should address the patterns of activity, seeking to disperse access and use to take better advantage of the Outer Bay and reduce the conflicts and perceived crowding in the Inner Bay and the Narrows.

Management Goal: Ensure high quality recreation experience, maintaining a diversity of uses limited only by safety considerations, perceived crowding, and minimized impacts on the natural resources.

Key Indicator Standards: Reduce and maintain a level of 50% or less survey respondents reporting perceived crowding.

Monitoring: A user survey should be conducted every year to monitor perceived crowding on the standard nine point scale.

Management Objectives

1. Public education on methods to reduce perceived crowding in Malletts Bay.
2. Specifically address locations where perceived crowding is the highest.

Management Strategies

1. **Public Education: Crowded Locations and Times**
 - a. Post public education posters alerting boaters of the busiest use times.
 - b. Post schedule of sailing races, fishing derby's, and other special events.
 - c. Provide information on less crowded areas.
2. Strategies to reduce boating conflicts (addressed in other sections).
3. Disperse boating access (addressed in other sections).
4. Limit the amount of surface area devoted to moorings (addressed in other sections).
5. Limit the number of boats and manage the pattern of use (addressed in other sections).
6. Explore the potential of dredging the Sand Bar (addressed in other sections).

Public Access

Issue Description: Inadequate public access to the waters of Malletts Bay including access for small motorized boats, non-motorized boats, pedestrian, swimming, shoreline fishing, and bay viewing is a concern expressed by many. The Malletts Bay Fish and Wildlife Access Area is inadequate to meet demand. The location of the Fish and Wildlife Access Area and all the marinas compounds boating conflicts and perceived crowding.

Public Access to the Water from the Shore is Limited to: The Malletts Bay Fish and Wildlife Access Area is the only free public boat launching site providing direct access to Malletts Bay limited to 184 parking spaces.

Public Access to the Shore from the Waters is Limited to: Marinas provide some dock space for transient tie-up, usually for a small fee. Facilities, once on shore, are very limited.

Public Access from Inland to the Shoreline for Viewing, Fishing, and Swimming is Limited to: Bayside Park experiences extensive use by the Town Recreation programs, but limited public use; the Causeway has limited accessibility, and no parking; Malletts Bay State Park is planned to include a Nature Center, trails, and picnicking but there is no schedule for implementation; Marble Island Resort has plans for a fishing pier as part of their expansion, likely delayed due to fire.

Winter Access to the Ice is Limited to: Malletts Bay Fish and Wildlife Access Area (however ice ridges through the Narrows generally prohibit travel to the Outer Bay from the Inner Bay). Ice fishing vehicles often access across private property by "handshake agreement" off Porter's Point in the Outer Bay and Niquette Bay in the Inner Bay.

If boating access were increased in the Inner Bay without the implementation of management strategies we would expect a compounding of existing conflicts and perceived crowding particularly for the high use areas of the Inner Bay including: East Spaulding Bay, the central area of the Inner Bay, and the Narrows. Additional parking spaces or the development of a new ramp at the Malletts Bay Fish and Wildlife Access Area would have the most direct impact on increasing peak use level and conflicts.

Management Goal: Provide adequate public access for a diversity of water and shoreline uses identifying locations with suitable lake and shoreline conditions and where facilities will improve use patterns, decrease boating conflicts, and perceived crowding.

Monitoring: Questions regarding user satisfaction with access and facilities locations should be included in the user surveys conducted every year.

Management Objectives

1. Reduce pressure on the Malletts Bay Fish and Wildlife Access Area.
2. Reduce the amount of boating conflicts and perceived crowding in the Narrows by providing additional public access to the water from the shore for small motorized boats in the Outer Bay and non-motorized boats on the north shore of the Inner Bay.
3. Enhance the existing and provide additional public access to the shore from the water particularly addressing the transient boaters seeking short-term anchorage or berths, and connections to the shoreline.
4. Enhance the existing and provide additional public access to the shore from inland, particularly for swimming, shoreline fishing, bay viewing, pedestrians, and bicyclists.

Management Strategies

1. Public boat access to the water from the shore.
 - a. Do not increase the capacity of the Malletts Bay Fish and Wildlife Access Area, but provide the following improvements: restrooms, washdown area for control of aquatic nuisances, parking clarification, and the attendants to take more control in directing traffic.
 - b. Install directional signage for all public access points in and around Malletts Bay.
 - c. Post maps of all area access points at each area public access.
 - d. Develop a new small motorized boat access in the Outer Bay. Potential locations: at the southern end of the Causeway OR at Thayers Beach (Rosetti property).
 - e. Develop a car top launch access for non-motorized boats along the northern shore of the Inner Bay. Possible locations: Malletts Bay State Park OR Nourses Corner.
 - f. Encourage public use of commercial lakeshore properties. However, do not substantially increase public boat access to the south shore of Inner Bay.
2. Public access to the shore from the water.
 - a. Develop public anchorage area, dock, public restrooms and pedestrian access between Coates Island and Bayside Park.
 - b. Develop a public dock at the proposed Malletts Bay State Park.

3. **Public access to the shore from inland:** swimming, shoreline fishing, and viewing.
 - a. **Thayers Beach** could provide for an extensive public beach for swimming and viewing.
 - b. **Bayside Park:** Remove the fee and entry booth and determine the potential of developing a small parking area on the bay side of the road, winter access drive, and another dock or pier for shoreline fishing.
 - c. Parking at the southern end of the Causeway would improve accessibility for shoreline fishing.
 - d. Develop a boardwalk, fishing pier and/or public viewing area between Coates Island and Bayside Park.
 - e. A fishing pier is included in the expansion plans for Marble Island.
 - f. Implement the plans for the Malletts Bay State Park, with the potential additions of a dock and car top launch access.
 - g. Encourage commercial lakeshore properties to provide public access to the shore through incentives.
4. Develop a Harbor Improvement Plan as part of Phase Two.

Cultural Heritage Resources and Tourism and Hospitality Facilities

Issue Description: Relative to the high use level in Malletts Bay there are surprisingly few services and facilities, walkways, restaurants, overnight lodging, and shops. Likewise, there are numerous cultural heritage resources that have not been inventoried. Once inventoried themes or historic contexts could be developed that would interpret the historic significance of Malletts Bay. Themes such as maritime history, tourism, or seasonal recreating could be developed into walking tours. The Lakeshore Redevelopment Committee was recently formed to address the question of how to improve the Lakeshore Drive area to bring the quality of tourism facilities up to the level of the scenic setting of Malletts Bay. The vision of the Bay Project will include an improved and revitalized Lakeshore Drive in a village style and a possible "Baywalk" along a new retaining wall in the Bay. The many existing historic buildings and structures (many of the "camps") that exist along the Bay could be the focus of exciting tourism initiatives once the resources have been inventoried and interpreted.

Management Goal: Develop recreation and tourism opportunities improving the local economy and complementing the scenic setting of the bay.

Management Objectives: Support and coordinate with the efforts of the Lakeshore Redevelopment Committee. Promote the identification and designation of historic and cultural features for publicizing and protection.

Management Strategies

1. Concentrate much of the public shoreline facilities for bay viewing, strolling along the water's edge, and shoreline fishing in the area between Coates Island and Bayside Park to coordinate with the Lakeshore Redevelopment.
2. Encourage marina owners to upgrade their facilities.
3. Prepare a Malletts Bay brochure.
4. Schedule summer and winter bayside events and festivals.
5. Encourage Lake Champlain Bikeways Committee to establish a bicycle route through the Malletts Bay area.
6. Encourage Lake Champlain Paddlers Trail Committee to highlight Malletts Bay.
7. Identify key historic themes relating to Malletts Bay such as "Seasonal Tourism" and "Industry," then inventory, evaluate, and interpret.
8. Develop a detailed archaeological sensitivity map.
9. Increase awareness of local heritage through the public schools.
10. Work with Lake Champlain Basin Cultural Heritage Office to coordinate Heritage Tourism Initiatives.

Water Quality and Aquatic Nuisances

Issue Description: Water quality and the presence of aquatic nuisance species have a direct effect on the recreation experience. In the open-ended comments of the user survey, 51 of a total 149 comments included concerns regarding water quality and aquatic nuisance plants. Of greatest concern in Malletts Bay is the level of fecal coliform and E. coli bacteria. Trends in sampling results suggest that several locations within the Inner Bay regularly contain fecal coliform and E. coli bacteria at densities higher than those limits set by the Vermont State Health Department as safe for recreational waters. The presence of aquatic nuisance plants ("weeds and algae") was the second most frequently expressed concern in the open-ended comments of the survey. Eurasian watermilfoil is present in Malletts Bay, but not pervasive. At this point no zebra mussels have been reported in Malletts Bay, however, the Vermont Department of Environmental Conservation (DEC) expects there will be sightings by the summer of 1995. Sea lamprey management control methods are being effective.

Management Goal: Improve and maintain the water quality of Malletts Bay to ensure safe water contact recreation activities. Prevent the introduction/spread of non-native, nuisance aquatic species in Malletts Bay.

Key Indicator Standards: Maintain test results below the State Standards for fecal coliform and E. coli bacteria. Identify standards for aquatic nuisances after one year of monitoring.

Monitoring: Continue the annual Water Quality Monitoring Program. Establish an Aquatic Nuisance Monitoring Program.

Management Objectives

1. Identify and address water quality septic issues.
2. Develop public education on water quality septic issues.
3. Coordinate aquatic nuisance monitoring and control strategies in Malletts Bay.
4. Develop public education on aquatic nuisance species.

Management Strategies

1. Continue the Water Quality Monitoring Program.
2. Increase public education on the regulations against dumping of boat holding tanks.
3. Increase the Coast Guard "Courtesy Inspection" to include checking the closure of the "Y" valve on boat holding tanks.
4. Include public restrooms at the existing Malletts Bay Fish and Wildlife access.
5. Provide cost sharing for marinas to improve their pumpout facilities.
6. Provide public education pamphlets to all shorefront residents on "best management practices" for shoreland improvements and development.
7. Develop a Malletts Bay Aquatic Nuisance Coordinator pilot project.
8. Develop a wash down station at the Malletts Bay Fish and Wildlife Access Area to control the spread of Eurasian watermilfoil and zebra mussels.

Fish, Wildlife, and Wetlands

Issue Description: Shoreline areas identified as Natural Heritage Inventory sites include: the wetlands on the south side of the Lamoyille River, along Malletts Creek, and between Mills and Porters Points, and Clay Point, the entire northern shoreline of the Inner Bay (Braeloch area), the Malletts Bay State Park parcel, the islands off Malletts Head, and the knob on the northwest shore of Malletts Head. There are no specific mapped aquatic habitat or more specific wildlife habitat data.

Management Goal: Manage the ecological communities to provide continuing social and environmental benefits. No decline in abundance of diversity.

Key Indicator Standard: At this point, not enough information is available to set standards.

Monitoring: Establish an Indicator Species Monitoring Program.

Management Objectives

1. Minimize adverse environmental impacts of water based recreation.
2. Promote the identification, designation, and protection of rare, threatened, and endangered species and significant natural communities.
3. Provide public education on best management practices for habitat enhancement and protection.

Management Strategies

1. Identify Conservation Water Management Zones at Malletts Creek and the water surface area abutting the wetlands between Mills and Porter Point and the south bank of Lamoille River.
2. Conduct a comprehensive bay-wide study to determine and refine information regarding critical fish and wildlife habitats and wetlands to be protected.
3. Establish an Indicator Species Monitoring Program.
4. Identify priority parcels for public acquisition, protection and conservation easements.
5. Revise the town regulation of the Shoreland Overlay district to include "best management practices".
6. Coordinate an annual shoreland revegetation event.

Marinas, Moorings, Docks, and Anchorages

Issue Description: The number of moorings associated with marinas and boating associations along the southwest shore of the Inner Bay has been a growing concern, specifically potential conflicts with navigation, increased congestion, reduction in usable space for recreation activity, poorly marked and illegally placed moorings, and visual impact. The only restriction on the number of boats associated with a commercial mooring is the current zoning regulation which requires one off-street parking space per berth. Residential marinas are required to have a minimum of 150' lake frontage for 5 boats and 30' for each additional boat. All the marinas and boating associations of Malletts Bay are located on the south and southwest shores of the Inner Bay, accommodating approximately 800 boats, fairly evenly split between moorings and dock slips.

Once moorings occupy an area, that water surface is no longer available for any recreational use. Likewise the location of dense moorings can have direct impacts on the boating patterns affecting the level of perceived crowding and boating conflicts. Utilizing a regression model correlating perceived crowding and peak usage and calculating the average percent of marina boats in use, we can determine what percentage of an increase in marina berths and private berths would raise perceived crowding to the 65% benchmark. However, the data upon which the regression model is currently based is extremely scant. Further monitoring will build confidence in the model.

According to the pending town mooring regulations, moorings must be accessed within 1000' across private property by the shoreline resident or by others with permission or rights of way from the landowner. Should it be determined that there is a strong correlation between perceived crowding and peak hour boat usage, the number of private berths could be limited by the linear feet of shoreline, with varying ratios to reflect the suitability of the zone to moorings or recreation activities.

Docks at marinas and boat clubs provide efficient accommodations, decreasing the surface area and visual impacts of the volume of boats. Several public meeting attendees and key informants suggested marinas should be encouraged to accommodate all boats in dock slips, excepting those requiring greater depth.

Two Special Anchorage Areas are designated in the Inner Bay: one east of Malletts Head and the other east of Coates Island.

Management Goal: Ensure adequate berthing and anchorage for seasonal and transient boats in appropriate locations where they will not conflict with recreation uses and will not compound boating conflicts, perceived crowding, and visual impacts.

Monitoring: Require every boat berth to be registered annually with the Harbormaster noting boat owner's name and berth location, and means of access. Review monitoring results of survey conducted every year and correlate perceived crowding and peak boat usage, to determine if limits on berth spaces are justified.

Management Objectives

1. Identify area for high density and low density boat berthing and suggest limits to commercial and private boat berthing.
2. Encourage the most efficient layout of boat berths in appropriate locations.
3. Provide adequate boat berthing and anchorage for seasonal and transient boaters.
4. Identify areas where boat berthing should be prohibited.

Management Strategies

1. Establish a means to limit the number of berths at marinas and boating associations, based upon a regression model of peak hour use and perceived crowding if there is a strong correlation after at least two more summers of data collection.
2. Review marina and boating association development plans for expanding existing or proposing new berthing facilities for impact on boating patterns, perceived crowding, and boating conflicts particularly in the Inner Bay.
3. Dense mooring fields with public transient moorings to be identified east of Malletts Head and east of Coates Island.
4. Private berths to be limited to 1 berth per 100' of shoreline frontage along Thayers Beach to minimize impact on this valued recreation area.
5. No berths permitted along the shoreline of Malletts Bay State Park, along the south shore of the Lamaille River, along Malletts Creek, and between Porters and Mills Points to protect critical wetland habitats.
6. Limit all moorings to be within 500' of the mean low water mark.
7. **Mooring Tackle**
 - a. Paint fluorescent orange.
 - b. Enforce regulation requiring I.D. on tackle.
 - c. Encourage manufacturer of permanent moorings to explore breakaway top.

Implementation of the Recreation Management Plan

The following steps are suggested as the means for implementing the Malletts Bay Recreation Management Plan including:

- The identification of the local administration responsible for overseeing the implementation.
- The integration of locational management strategies into one map of Water Management Zones with associated policies for each zone.

Local Administration of the Malletts Bay Recreation Management Plan

Establish The Malletts Bay Harbor Commission with the primary function of overseeing the implementation of the Malletts Bay Recreation Management Plan. The Commission's responsibilities would include:

- Overseeing the implementation of the Recreation Management Plan.
- Prioritizing and initiating the management strategies.
- Research funding opportunities for implementing the management strategies.
- Coordinating the monitoring efforts and comparing the data with the Key Indicator Standards.

- Coordinating the preparation and distribution of educational materials.
- Reviewing all proposed waterfront redevelopment projects in an advisory role reporting to the Planning Commission.
- Update and revise the Malletts Bay Recreation Management Plan every five years.

Water Management Zones

(See attached map of Water Management Zones.)

The purpose of the Water Management Zones is to coordinate the management strategies with locational aspects. The policies associated with the Water Management Zones should ensure a diversity of uses of Malletts Bay, while:

- Minimizing boating conflicts and perceived crowding.
- Providing adequate access.
- Identifying areas for enhancing cultural heritage resources and tourism opportunities.
- Improving and maintaining water quality and addressing aquatic nuisances.
- Protecting critical habitats.
- Managing marinas, moorings, docks, and anchorages.

Conservation Water Management Zone:

Purpose: To protect areas with scenic values, plant and wildlife habitat, and wetlands, maintaining high water quality and natural shoreline conditions.

Location: Four separate areas are identified as Conservation Zones: Malletts Creek, Lamoille River and Sand Bar Wildlife Refuge, waters off of the Malletts Bay State Park, the area between Mills and Porters Points.

Policies:

- No additional mooring or anchoring of boats permitted beyond those that were existing at the time of acceptance of the plan.
- No additional docks, floats, or boat lifts beyond those that were existing at the time of acceptance of the plan.
- Can develop public facilities, providing for the appropriate uses of nature enjoyment: i.e., dock for tie-up at Malletts Bay State Park.
- Acquisition of land and permanent conservation restriction on abutting land is encouraged.
- In order to preserve the natural shoreline and wetland functions, activities and alterations such as structural shoreline protection should not be allowed.
- A potential car top launch site at the Malletts Bay State Park.

Low Intensity Use:

Purpose: To maintain areas with scenic and natural habitat values, maintaining water quality while providing for low intensity uses that will not detract from these values.

Location: These areas are the water area extending 500' into the bay from the mean low water mark of predominantly residential shorelines. The entire shoreline of the Outer Bay and the northern shoreline of the Inner Bay, with the exclusion of the areas identified as Conservation Zones.

Policies:

- Moorings to be within 500' of the mean low water mark.
- Encourage the use of community docks, piers and floats.
- Encourage shorefront property owners to use native species revegetation and non-structural shoreline protections as preferred methods.

- Configuration of moorings and location of activities and alterations shall not significantly interfere with public use and enjoyment of the public waters.
- Potential public boat accesses are identified in the Low Intensity Use Zones: small motorized and non-motorized boat accesses at the base of the Causeway by Mills Point, OR along Thayers Beach at Rosetti's property.

High Intensity Recreational Use:

Purpose: To provide, maintain, and enhance areas for high intensity boating and services that support that activity.

Location: The southwest area of the Inner Bay from Nourse's Corner to the top of Malletts Head including the special anchorage areas and high traffic areas of the Inner Bay, with the exception of the water along shoreline from Bayside Park to the base of Coates Island, and the innermost water surface of East Spaulding Bay which is proposed as Village/Commercial Use.

Policies:

- Proposed activities or alterations will be permitted that enhance the quality and safety of recreation boating activities.
- Planning and management decisions regarding this area will prioritize mooring fields, public shoreline access such as waterfront parks, beaches, and other water-dependent facilities that support recreational boating and enhance public access.
- Planning and management decisions regarding this area should focus on reducing boating conflicts and perceived crowding.
- Manage moorings densities along the shorefront from Nourse's Corner to Bayside Park to minimize impacts on navigation and recreation use particularly swimming.
- Improve and maintain water quality of levels suitable for water-contact recreational activities.
- Potential public access is identified at Nourse's Corner for car top launch sites.

Multi-Purpose Use:

Purpose: To accommodate a diversity of water-based recreational activities on the large expanses of unobstructed water.

Location: The large expanses of unobstructed waters in Inner and Outer Malletts Bay.

Policies:

- Safely accommodate the diversity of water-based activities, including new sports.
- Establish areas and times for races, tournaments and special uses to avoid conflicts: i.e., sailing races, fishing tournaments, water skiing events, and personal watercraft "stunt riding."
- Maintain the area free of moorings and other obstructions to water-based recreationists.
- Planning and management decisions for this area will prioritize unobstructed water for multiple water-dependent recreational activities from alterations and activities that threaten boat safety, and increase boating conflicts or perceived crowding.

Commercial Use:

Purpose: Maintain and enhance bayside commercial facilities to efficiently accommodate the diversity of water-based recreationists in a scenic, well-maintained setting, while promoting the local community economy.

Location: The southwest shoreline of the Inner Bay extending into the bay 500' from the mean low water mark from Coates Island to Bayside Park, and the innermost area of East Spaulding Bay.

Policies:

- Coordinate with the Lakeshore Redevelopment efforts.
- Encourage and upgrade the provision of support facilities for water-based recreationists.
- Upgrade and maintain boat storage areas, loading and unloading, and servicing of recreational craft.
- Encourage facilities for public access to the shoreline (including visual and pedestrian access).
- Enhance and maintain high water quality.
- Plan for installation of a sewer system.
- Strict controls on fuel handling facilities.
- Do not increase capacity of the Fish and Wildlife Access Area.
- Continue to monitor peak boat usage and perceived crowding. If strong correlation, consider placing limits on the number of berths.
- Utilize Fish and Wildlife Access Area and marinas as education outlets.

Navigational Routes, Channels, and Fairways:

Purpose: Maintain safe water passage from high density moorings in the Inner Bay, through the Narrows and on to the Cut, or to Thayers Beach.

Policies:

- Educate about high-use periods or summer weekend days from 11 a.m. - 3:30 p.m. when the uses within the Narrows should be navigation only: enforcement to discourage fishing, water skiing, or anchoring. Educate on these activities being illegal in the Cut at anytime.
- Enforce no-wake zone.
- Keep free of any obstructions other than navigation aids.
- Install and monitor temporary navigation markers in the Narrows as suggested in the Management Strategies under Boating Conflicts.

Proposed Water Management Zones

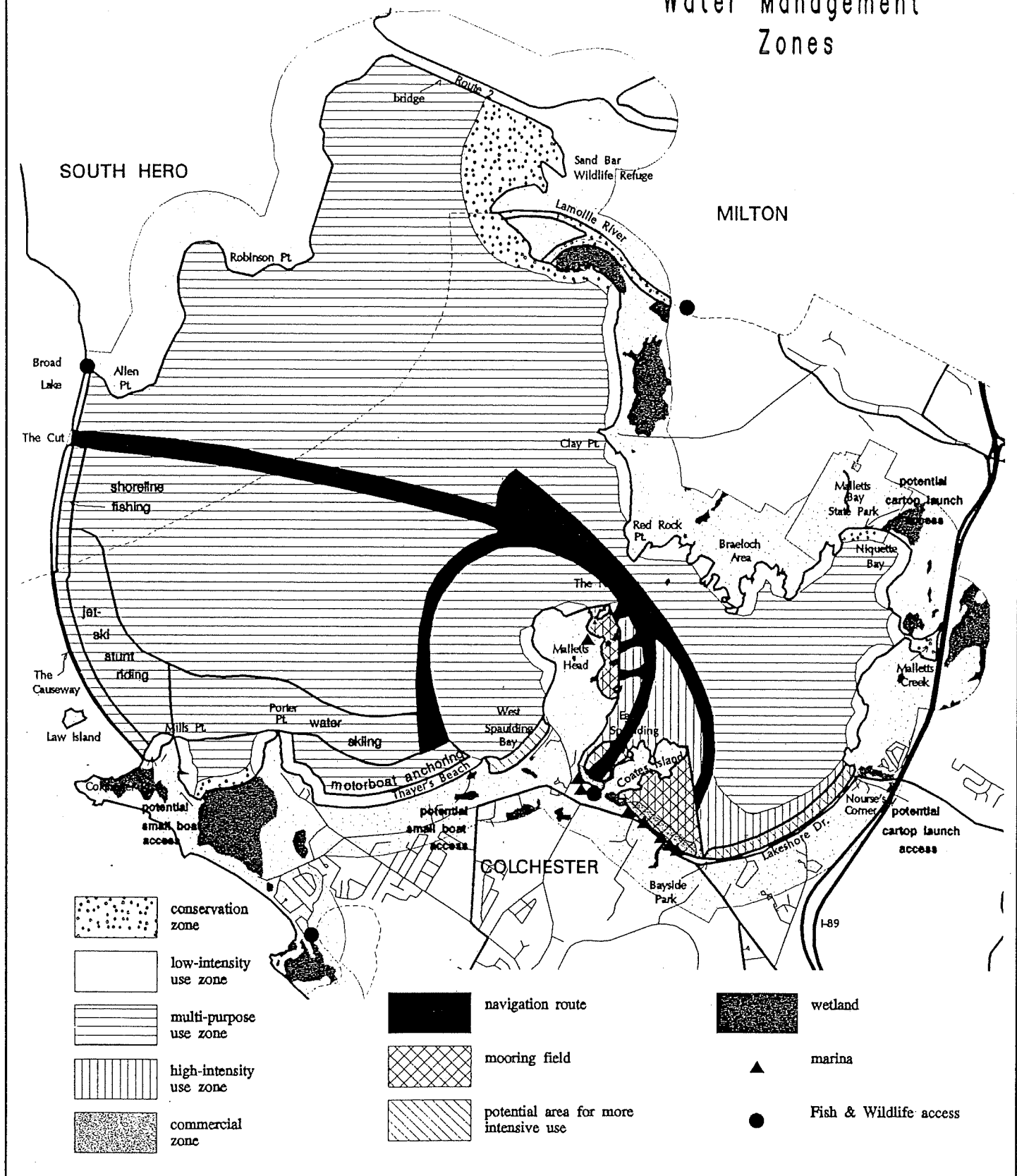


Figure 18

Chapter One: Overview

Introduction

Malletts Bay is a scenic bay of Lake Champlain located near the most populated area of Vermont, bordered by the towns of Colchester, Milton, and South Hero. Malletts Bay is composed of two bays: the larger Outer Bay contained by the abandoned railroad causeway to the west and the Route 2 causeway to the north and the smaller Inner Bay, which is located entirely in the Town of Colchester. A constricted stretch of water known locally as the Narrows connects the two Bays. The southern shores of both the Inner and Outer Bays are populated with year-round and seasonal homes, quite dense in some areas, while the north shores tend to be more sparsely developed. The southwest shore of the Inner Bay supports several marinas and the Fish and Wildlife Access Area (see Figure 1, page 1 of the Executive Summary). The natural features of Malletts Bay offers conditions suitable for a wide diversity of water-based summer and winter recreational uses. Over the years, recreationists and officials with jurisdiction in Malletts Bay have expressed concerns about crowding and conflicts between boaters, the need for more public access, and the extent of moorings. These issues have been discussed at length by various commissions, agencies, and officials in the Town of Colchester, at the state level, and through the processes of the Lake Champlain Basin Program. It is hoped that the Malletts Bay Recreation Management Plan will provide an evolving tool to address these and other issues as the concerns and recreation patterns change through the coming years.

Project Objective

The objective of the Malletts Bay Recreation Management Plan project is to determine how the public waters of Malletts Bay can be managed in the best interest of the citizens of the State. The resulting recreation plan will be utilized by the Town of Colchester to manage recreation use of Malletts Bay.

Project Background

In 1990, the Vermont Legislature passed Act 265 mandating the Secretary of Natural Resources to develop recreation management plans for all lake and ponds greater than 20 acres, including Lake Champlain. Act 265 has been sunsetted, but the authority to create management plans for lakes and ponds is still covered under §1423. Several state agencies have been developing the framework for these management plans including identifying priority lakes, documenting uses, crowding measures, and use capacity guidelines.

Town of Colchester filed a petition with the Water Resource Board in July 1991 seeking authority to regulate boat moorings and other uses of public waters of Malletts Bay. The delegation was granted for a trial period of 5 years with the understanding the town may seek an extension and expansion of the powers should it complete a comprehensive recreation management plan for Malletts Bay.

The Lake Champlain Basin Program under the Lake Champlain Basin Program, identified Malletts Bay as a high use area in need of a recreation management plan. This study could serve as a pilot study for other high use areas of Lake Champlain.

Funding

Lake Champlain Basin Program under the Lake Champlain Basin Program approved funding for the Malletts Bay Recreation Management Plan during federal FY93. Sources of funds are from the U.S. Environmental Protection Agency and the National Park Service. The Town of Colchester and the Vermont Department of Forests, Parks and Recreation contributed the required matching funds through in-kind services and cash.

Study Area

The study area for the Malletts Bay Recreation Management Plan includes both the Inner and Outer Bays to the causeways and 2000' inland (see Figure 1, page 1 of the Executive Summary). Any reference to "Malletts Bay" or the "Bay" in this report refers to both the Inner and Outer Bays.

Planning Process

The Malletts Bay Recreation Management Plan is to be developed as two phases. This report reflects Phase One, which includes three steps: Inventory and Assessment, Analysis and Recommendations, and Policy Formation. Phase II will involve two steps: Decision Making Model Development and Implementation.

Phase One: Inventory, Assessment and Policy Formation

1. **Inventory and Assessment** involved several information gathering studies of Malletts Bay including:
 - **Natural and Built Resource Inventory:** Mapping of resources on Geographic Information System (GIS) from existing databases.
 - **Institutional Review Analysis:** Documenting the federal, state and local laws, policies, rules and authority for Malletts Bay.
 - **Review of Relevant Studies:** Reviewing all relevant federal, state and town plans, studies, reports, and programs to determine the impacts of findings, recommendations, and actions on Malletts Bay.
 - **User Survey, Use Counts, Public Attitude Survey, and Key Informant Interviews:** Conducting intensive user survey on six days through the Fish and Wildlife Access Area, at marinas, and from shoreline residents. Use counts were conducted through fly-overs in morning and afternoon of each survey day. A general attitude survey was conducted by telephone of Chittenden County residents. Key persons in Malletts Bay, representing various recreation groups, local businesses, and grassroots advocacy groups, were also interviewed.
 - **Public Informational Meetings:** A series of eleven Public/Steering Committee Meetings and Workshops were conducted throughout the planning process.
2. **Analysis and Recommendation** involved developing a **Recreational Use Analysis** summarizing the results of the Inventory and Assessment and forecasting the recreational and facilities needs and potentials.
3. **Policy Formation** involved making recommendations to address the issues and opportunities identified in the Inventory and Recreational Use Analysis, and developing **Management Objectives and Strategies** and an **Economic Analysis** evaluating their economic impacts.

This report includes summaries of the Inventory and Assessment and the Recreation Use Analysis tasks (Chapters 2 and 3), and full documentation of the Policy Formation, Chapter 4. Separate reports are available for the Natural and Built Resource Inventory Data Documentation, Institutional Review Analysis, Review of Relevant Studies, and Survey.

Phase Two: Decision Making and Implementation Techniques

Phase Two is dependent upon future approval and funding will include two major steps:

1. **Decision Making Model Development:** A computer model to allow analyzing how a change in one variable or strategy could impact others.
2. **Implementation:** The development of a Harbor Improvement Plan and recommended revisions to Town plans, regulations, and programs and rules adopted by the Water Resources Board.

Framework for Developing the Management Plan

The process of developing a recreation management plan for Malletts Bay is based in part upon the Visitor Impact Management (VIM) planning framework. This is a relatively new process for accessing the impacts of recreational use on a resource.

This VIM process consists of the following steps: 1) a review of relevant studies and recommendations concerning visitor impact on a resource; 2) the identification of management objectives for the resource and for the visitor experience; 3) the selection of social and ecological indicators, or key indicator standards, that will measure the success/failure of management objectives; 4) the development of management strategies to reduce visitor impact on a resource if it is determined that objectives are not being met; and 5) implementation of a management strategy(s), and continued monitoring of its success against the identified objectives. The VIM process provides managers with information about making rational decisions to manage for unacceptable user impacts (Zwick Associates, et al., 1990).

Through the VIM process, we explored recreational carrying capacity for the Bay, not as a fixed number, which research has shown to be ineffective, but as a correlation of social perceptions and physical constraints, and developed management strategies to reduce unacceptable impacts. This is likely to be more effective in addressing the specific concerns for Malletts Bay.

Malletts Bay Steering Committee

The project development has been closely guided by a Steering Committee composed of eight community members and the Town Planner, representing a diversity of recreational, commercial, and shoreline resident interests.

The Town of Colchester solicited applications for positions on the Steering Committee at the start of the project. The Selectboard approved the final list of Steering Committee members, which included:

- A member of the Malletts Bay Advisory Commission, also a shorefront resident.
- A member of the Lakeshore Redevelopment Committee.
- An owner of a marina and active sailor.
- A public access advocate and avid angler (summer and winter).
- A Selectboard member, marina manager, and avid waterskier and powerboater.
- A town resident, retired teacher, and building designer.
- An avid powerboater and manager of charter boat company.
- The Town Planner, also an avid swimmer and canoeist.

The majority of the Steering Committee Members attended all the meetings and participated actively. Halfway through the project, the initial member representing the Selectboard was replaced through Town election of a new Selectboard member, who likewise was an active Bay user. The eight-member Steering Committee was key to the development of appropriate management strategies, and will be instrumental to the implementation of the plan.

Chapter Two: Inventory and Assessment

Inventory of Natural and Built Resources

A full report of the inventory, data layers, and data sources is available for review under separate cover of the Colchester Town offices.

An important step in developing a Recreation Management Plan for Malletts Bay is inventorying existing resources, conditions, and activities in, on, and near the water. The use of geographic information systems (GIS) technology was specified for this project because of a GIS's ability to store, analyze, and display mapped information. The mapped information can be thought of as being stored in "layers" in the computer with each theme or type of information usually corresponding to an individual data layer. For example, information about roads is stored in one layer, information about moorings in another.

What follows is a description of natural and cultural resources of Malletts Bay and the data layers compiled in the GIS. Some digital data layers were simply copied from available sources and used as is (i.e., soils data). Others were compiled from scratch (i.e., private moorings data). Other digital layers were modified or updated from existing data sets (i.e., roads, land use).

Natural Resources Inventory: Summary (see Figure 2)

Geography and Shoreline Configuration

Malletts Bay is located on the eastern shores of Lake Champlain along the Colchester shoreline and to the southeast of the Town of South Hero on Grand Isle. Malletts Bay is actually composed of two bays: the Outer Bay and the Inner Bay, connected by a constricted stretch of water known locally as the Narrows. Two points of land, Malletts Head jutting into the water from the south shore, and Red Rock Point from the north, define the Narrows. The abandoned railroad causeway along the west, known locally as "the Causeway," and the Route 2/Sand Bar causeway to the north define the Outer Bay, nearly separating it from the Broad Lake to the west and the Inland Sea to the north. The approximately 200' wide opening in the "cut" in the Causeway is the major connection between Malletts Bay and the Broad Lake. A bridge in the Sand Bar causeway allows limited connection to the Inland Sea due to very shallow depths. The Lamoille River flows directly into the northern area of the Outer Bay.

The shoreline of Malletts Bay was digitized from 1988 orthophotographs, at 1:5000 scale by the Chittenden County Regional Planning Commission (CCRPC).

Soils

Soils data were clipped from the digital soil set for Chittenden County. The University of Vermont created this GIS data set in 1985 digitizing corrected 1:20,000 scale maps from the USDA Soil Conservation Service's, *Soils of Chittenden County, Vermont*, 1974. The predominant soils are: Adams loamy sand, along most of the south and east shores of both Inner and Outer Bays, stretches of Farmington loam with very shallow depth to bedrock along the northern shore of the Inner Bay, locally known as the Braeloch area, and Malletts Head, and Covington clay soils in areas of wetlands in Niquette Bay, around Malletts Creek, along the Lamoille River and between Mills and Porters Points.

Topography

Land contours were generated at 20' intervals from digital elevation data provided by Vermont Center for Geographic Information (VCGI). The shores of most of the Outer Bay are relatively flat, with the exception of the eastern shores. The Inner Bay shores are composed of many small hills, with some exposed ledges and steep shorelines along the northern, eastern, and western shores. A group of small rocky islands are located to the east of Malletts Head. The southern shore rises gently accommodating the highest density of shoreline residents and commercial enterprises.

Bathymetry

Bathymetry contours at 10' intervals were generated from the 1:40,000 scale NOAA navigational charts previously digitized by the CCRPC. Water depths of the Inner Bay range from 0' to 75' sloping fairly consistently toward the center of the Bay, providing minimal underwater hazards. Water depths of the Outer Bay range from 0' to 105' sloping gently for the first 3500' from the south shore and 2500' from the Causeway to the west and the eastern shores. The northeast area of the Outer Bay is quite shallow maintaining under 5' depth up to 3000' from the shoreline and 15' depth up to a mile from shoreline. This area tends to be quite weedy and avoided by most recreationists, other than windsurfers and some anglers.

Natural Heritage Inventory Sites

The Natural Heritage Inventory includes rare, threatened, and endangered species sites and significant natural communities identified by the State of Vermont, Agency of Natural Resources (ANR), Fish and Wildlife Department's Natural Heritage Program (NHP). Not all site locations have been field verified. In order to protect the species and communities involved, their locations are represented by an area (300 meter radius) around the sites rather than a specific point location. The data used here were provided by CCRPC based on a 1990-91 update of the county inventory previously done by the NHP. The polygons represent significant terrestrial communities rather than ranges or nesting sites of particular species. No mapping of aquatic habitats was available.

Natural Inventory sites identified in the Outer Bay include: the south shore of the Lamoille River, Clay Point, two hilltops of Malletts Head, and the large wetlands between Mills and Porters Points. Sites identified in the Inner Bay include: the shores of the Braeloch area (north shore of the Inner Bay), the entire Malletts Bay State Park site, and the Malletts Creek area.

Fish and Wildlife

More specific information on fish and wildlife habitat within the study area was sought from Tom Myers of Vermont ANR Fish and Wildlife Department's Essex Junction office. While there is no specific mapped wildlife habitat data, according to him "the whole Bay is extremely important for waterfowl and furbearers." Diving and dabbling ducks rely on underwater aquatics; shallow areas are important for waterfowl feeding and brood rearing. Within the study area, the Malletts Creek wetlands complex has been identified as particularly significant for wildlife and was included in the 1977 study *The Productivity of Lake Champlain with regard to Waterfowl, Furbearers, and other Wildlife* prepared for the International Joint Commission by T. R. Myers and D. D. Foley of the Vermont Department of Fish and Game. Malletts Creek provides breeding habitat for such species as black ducks, mallards, wood ducks, blue winged teal, muskrat, and beaver, among others.

Malletts Bay is comprised of a wide variety of fishery habitat that results in a very diversified fishery. The Lamoille River flows into Malletts Bay and offers excellent walleye spawning habitat and attracts salmon, and brown and rainbow trout in the fall. The mouths of Malletts Creek and the Lamoille River provide vast amounts of prime wetlands that are utilized by bass, northern pike,

bullhead, and other species. This variety of habitat and excellent water quality provides an excellent fishery for many species of fish and for all seasons. Malletts Bay is most noted for its walleye, black bass, northern pike, and salmon fishing during the open water season, and for yellow perch and northern pike during the winter. One of the most common areas to fish for salmon from the shore is at the Sandbar Bridge. During a spring weekend it is not uncommon to have 100 or more angler's cars and trailers parked at the Lamoille River access area. Malletts Bay probably receives more fishing pressure per acre than any of the other areas in Lake Champlain.

Deeryards

Deeryards within the study area were extracted from a statewide data set that was prepared by Vermont ANR in the 1980's at various scales and compiled into a digital data set at 1:24,000 scale. One approximate 90-acre area identified as a deeryard is located in the Malletts Bay State Park.

Wetlands

Wetlands were mapped by the U. S. Fish and Wildlife Service's National Wetlands Inventory (NWI) in the late 1970's at a scale of 1:80,000 from color infrared airphotos. The version of the data set used here originated from the Vermont Center for Geographic Information (VCGI). Throughout the state it has been found that many small wetlands were omitted by the NWI inventory and some non-wetland areas were incorrectly labeled as wetlands. However, the NWI inventory remains the standard in the state and no systematic detailed mapping of wetlands has occurred to replace or correct the NWI inventory. Wetlands, identified around Malletts Bay on the NWI, include the south side of the Lamoille River where the river meets the Outer Bay, an inland wetland north of Clay Point, in Niquette Bay, Malletts Creek, the base of Coates Island, two inland wetlands on the Rosetti Property at Thayers Beach, a large wetland between Porters and Mills Points, and several small scattered wetlands along creeks draining into the Inner Bay.

Surface Water

Surface water was extracted from rivers and streams digitized by 1:24,000 scale topographic maps by USGS, Albany in 1993 and provided by CCRPC. The Lamoille River flows into the northern area of the Outer Bay. Several creeks drain into the Inner Bay including Malletts Creek, Crooked Creek, and Smith Hollow Stream.

Water Quality Sampling Locations

The Town of Colchester has been performing water quality sampling at several locations along the southern shore of the Inner Bay several times a summer since 1989. The approximate location of the thirteen sampling sites were indicated by the Water Quality Coordinator on 1:24,000 scale and 1:15,000 scale maps.

Natural Resources of the Malletts Bay Study Area (draft map)

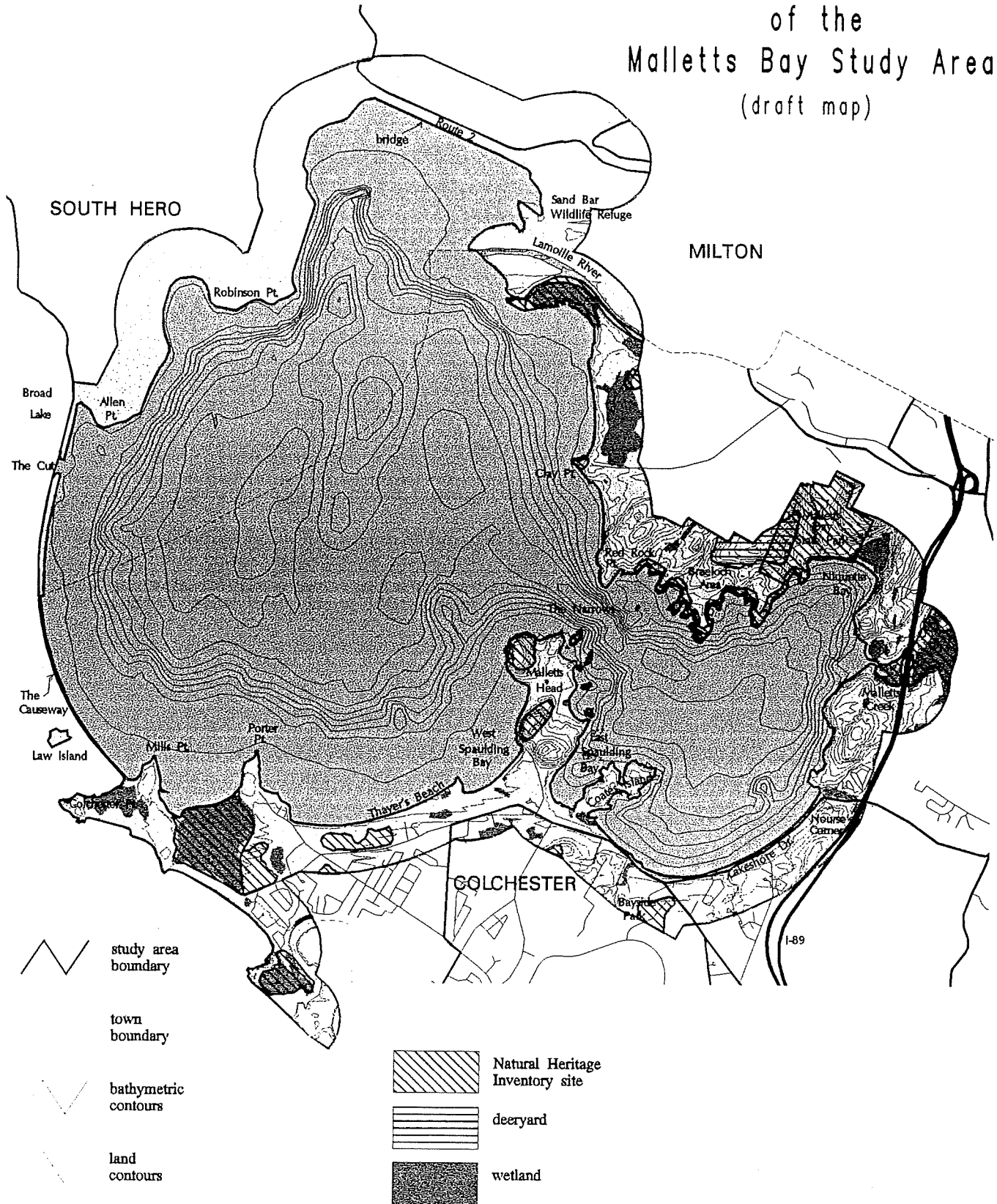


Figure 2

Built Resources Inventory: Summary (see Figure 3)

(The following data layers are not included on the reduced map, Figure 3, but can be viewed on full-scale maps at the Colchester Town office: Parcel Boundaries, Land Use, Zoning Utilities, Private Moorings, Archaeologically Sensitive Areas, Historic Structures, and Views.)

Study Area Boundary

The Study Area Boundary is generally 2000' inland from the shoreline generated from by the GIS software and modified to include significant larger parcels including the Malletts Bay State Park on the north shore of the Inner Bay.

Town Boundary

The town boundary was extracted from the 1:24,000 scale Vermont town boundaries data set developed by the VCGI. The Colchester town line follows the center of the Lamoille River and passes through the Outer Bay to the Causeway. Though the Outer Bay is bisected by the town line, the Harbormaster of the Colchester Town Police has jurisdiction over the entire water surface of Malletts Bay.

Roads

The roads within the study area were extracted from updated digital roads data for Chittenden County provided by CCRPC, prepared by VCGI as part of the statewide road centerline data set digitized from the 1988 1:5,000 scale orthophotos in 1991-92. The heavily traveled Lakeshore Drive passes along the south shore of the Inner Bay where all the marinas are located. Interstate 89 passes through the eastern edge of the study area, providing a glimpse of Malletts Bay where it crosses Malletts Creek.

Parcel Boundaries

The parcel boundaries data set was received from CCRPC. There are no parcel identification numbers associated with the parcels. The digital data set was originally developed by Wiemann-Lamphere in a CAD format from the town's paper tax maps. Lines appearing on those tax maps have been provided by surveyors over the years and (usually) show only the position of one parcel relative to others, rather than absolute position (latitude/longitude). Considerable effort has been expended by Wiemann-Lamphere, UVM, and CCRPC to convert these data to a useful GIS format (that is with absolute rather than relative positioning) so that the parcel data can be used in conjunction with other spatial data (soils, zoning, etc.). However, many discrepancies can be observed between the parcel lines and roads, surface water, and other features. In most cases these other features are considered more positionally accurate than the parcel boundary information.

Parcels tend to be 10 acres or larger, along the east shore of the Outer Bay and the north shore of the Inner Bay. These parcels are accessed off town roads connecting to Route 2. Properties of the eastern and southern shores of the Inner Bay tend to be smaller and vary significantly in size. Several camp parcels under a quarter acre, are located along the southeast shore of the Inner Bay where the Lakeshore Drive passes closer to the shoreline. Property sizes along the sandy southern shore of the Outer Bay also vary significantly with dense areas of small lots at the base of Malletts Head and on Porters Point, and several large parcels located along Thayers Beach.

Land Use

Land use/cover data layer is a modified version of what the town developed with CCRPC in July 1994 at 1:18,000 scale. The coding scheme was modified slightly from the land use/cover coding scheme proposed for use in Vermont by VCGI. In this data set, numerous land uses have been updated or

corrected, based on information provided by the town building inspector in November 1994. Land uses have been aggregated into a relatively small number of categories for the purposes of this study.

Nearly the entire shoreline of Malletts Bay is residential with the exception of scattered recreational parcels in both Inner and Outer Bays and Malletts Head, and commercial properties along the southwest shore of the Inner Bay.

Zoning

Zoning districts were originally mapped by Wiemann-Lamphere Architects and converted to Arc/INFO format by CCRPC. Some linework has been modified for this study based on corrections provided by the town building inspector. In general, the town zoning reflects the existing land use patterns. Lower density residential zones are identified along the east shore of the Outer Bay and north shores of the Inner Bay, and Coates Island and Malletts Head. Medium density residential zones are located along the south shores of both Inner and Outer Bays. Commercial zones are largely located along the southwest shore of the Inner Bay with a few commercial parcels on the southeast shore of Inner Bay, and the large Marble Island Resort parcel on Malletts Head. Wetland/floodplain zones are identified at Niquette's Creek, between Porter and Mills Points and along the entire shore of Mills Point.

Utilities

Water lines and electrical transmission and distribution lines were digitized by UVM in 1987 from 1:20,000 1978 orthophotos. No sewer lines are located within the study area. Town waterlines service the southern shore properties of both the Inner and Outer Bays. Electric distribution lines service all residential areas of Inner and Outer Bays.

Recreation Facilities

Point data was developed by the Vermont Department of Forests, Parks and Recreation in 1993 as part of its Vermont Outdoor Recreation Resources Inventory. Each point location has associated with it extensive attribute information such as the site operator's name and address, the types of activities that occur at the site, presence/absence of pump out facilities, availability of boat rentals, etc.

All of the marinas and their associated moorings and docks are located along the southwest shore of the Inner Bay, particularly east of Coates Island and in East Spaulding Bay. Malletts Bay State Park is on the north shore of the Inner Bay, Kamp Kiniaya is located on the northeast shore of the Outer Bay, and Camp Holy Cross, Camp Tara, Colchester Bay, and Airport Park are on the south side of the Outer Bay. See Table 1.

The "Phoenix" Underwater Historic Preserve is located just outside the causeway. Divers frequently use the Fish and Wildlife Access Area to access this and popular diving areas in the Inner Bay.

Private Moorings

Point data is based on field mapping of moorings carried out by the Colchester Police Department during several recent summers to correspond with its mooring permit application program. At this point, field mapping is not complete, with extensive sections of the Lakeshore Drive and Malletts Head shoreline remaining to be mapped. The mapped data represent the 656 private moorings, boat lifts, docks, and swim floats field mapped to date. Commercial mooring and docking facilities are not included in this inventory.

The field maps often contain a wealth of data in addition to the approximate location of the moorings. For many of the moorings some or all of the following information was recorded: owner, mooring type,

boat type, boat name, length, registration number. This same information is usually recorded on the mooring permit application and resides in the Police Department's Paradox database, providing a potential means of validating the information provided on permit applications once the permit number for each mapped mooring is determined.

Private moorings are relatively sparse along most of the Outer Bay and northshore of the Inner Bay, with the exception of a high density of private moorings in Niquette Bay, West Spaulding Bay, and along the eastern shores of Mills and Porter Points. The southwest, south, and eastern shores of the Inner Bay tend to have a higher density of private moorings.

Mooring Management Zones

The geographic coordinates for the town's mooring management zones that had been recorded by Wiemann-Lamphere were entered directly into the GIS. The Mooring Management Zones include the entire town shoreline of Inner and Outer Bays with the exceptions of the mouth of the Lamoille River and the Causeway. The boundaries of the six zones within the Inner and Outer Bays are largely created by drawing lines between points into the Bay. Zone 7 is located outside of Malletts Bay between Colchester Point and the Winooski River.

Special Anchorage Areas

Two Special Anchorage Areas are located in the Inner Bay. One on the east side of Malletts Head within Mooring Management Zone 5, and all of Zone 4 located east of Coates Islands. The delineation of the two special anchorages is based on navigation regulations in Volume 6 of the *U. S. Coast Pilot*.

Navigational Aids

The precise geographic coordinates of the five aids to navigation (three buoys, two lights) that are located in the bay were provided by the U.S. Coast Guard's *Light List*, Volume 1, 1994. The buoys are located in East Spaulding Bay, in a bay of the Braeloch area, and at the Cut. The navigational lights are located on either side of the Cut.

Regulatory Summer/Winter Use Areas

As far as could be determined, there are no areas officially established for, or precluded from, particular uses except for the 200' no wake zone and the two special anchorage areas permitted by the U. S. Coast Guard. The GIS software generated the limit of the no wake zone 200' from the shoreline. The Vermont State Police has waived the 200' no wake zone in an area adjacent to Brown Ledge Camp for the purpose of camp waterskiers.

Archaeologically Sensitive Areas

The Vermont Division for Historical Preservation (DHP) has identified approximately 30 prehistoric sites within the study area and has reason to believe that there are many others. Because adequate field surveys have not been possible to date, DHP experts feel it is misleading to indicate the locations of the few confirmed sites because this would imply that other sites do not harbor significant material, when in reality these other sites have simply not been examined. Because of the archaeological significance of this sheltered and biologically productive segment of Lake Champlain, DHP recommends that the Town of Colchester should do a thorough inventory of its prehistoric sites.

The approach DHP has taken for this study is to indicate two levels of archaeological sensitivity: sensitive and high sensitive areas, referring to the likelihood of finding significant archaeological deposits and/or evidence of intensive human occupation. Sensitivity is based on an environmental predictive model that takes into consideration slope, type of bedrock, and proximity to water, among

other factors. These areas were drafted onto 1:5000 scale orthophotos and then digitized into the GIS. DHP recognizes that this is a very broad-brushed approach to mapping archeological sensitivity and has expressed willingness to work with the Town to develop more detailed site-specific information.

One aquatic area of high archaeological sensitivity is located outside of Malletts Bay Causeway and designated as an Underwater Historic Preserve. This is the site of the "Phoenix" I, a 146 foot long steamboat, frequently accessed by divers from the Fish and Wildlife Access Area. Given the sheltered characteristics of the Bay, and the fact that over water (or ice) was a primary choice of transportation throughout most of the historic period, it is certain that significant underwater historic resources are present along the lakeshore or in the wider body of the Bay.

Historical Structures

Colchester was last inventoried by Vermont Division of Historic Preservation in 1976. There are a number of historic structures, including several camps, however there are only two listings in the Vermont Historic Sites and Structures Survey within the study area. These are Woehr House located on Lakeshore Drive and Braeloch Camp located on the north side of the Inner Bay. The locations of these sites were digitized from 1:5000 scale orthophotos because the UTM coordinates by DHP were found to be off by 200 - 500 meters. Neither structure is open to the public.

Views

An inventory of scenic resources is important because it can indicate areas to be protected or avoided, areas to become a focus of recreational and other types of development, and areas where a view could be improved in compliance with a particular management or development goal.

Two general classes of views can be distinguished in the study area: 1) views from the land toward the water, and 2) views from the water toward the land. The reason for the distinction is that all parts of the bay are public waters and, as such, can be a potential viewpoint. On the land, however, access to viewpoints is more limited because of private property and topographic and other obstructions. Therefore, inventorying scenic resources viewed from the land is largely a matter of identifying viewpoints whereas inventorying scenic resources viewed from the water is more a matter of ranking the scenery in the various segments of a 360 degree panorama. The consultant worked with the town planner and building inspector on a preliminary classification of views from the land.

The GIS views data layer includes a site number, an aesthetics rating, an accessibility rating, and a brief description of the site location. Aesthetics were subjectively ranked on a 1 - 5 scale, with 5 being the most outstanding view and 1 the least significant view worth noting. Accessibility was also ranked on a scale of 1 - 5, with 5 being the most accessible and 1 the least accessible. The accessibility rating takes into consideration whether the viewpoint is on public land (i.e., a road right of way) or on private land, how difficult it is to get to the viewpoint (i.e., must hike a steep path to reach viewpoint versus can enjoy view from car), and how dangerous the viewpoint is. For example, a public road could provide easy access to a particular viewpoint but, if the shoulder does not provide a safe place to pull off, it would be a dangerous spot from which to enjoy the view.

The majority of the viewpoints are along the south shore of the Inner Bay and Malletts Head. The shore of the Malletts Bay State Park was also identified as a significant viewpoint.

Built Resources of the Malletts Bay Study Area

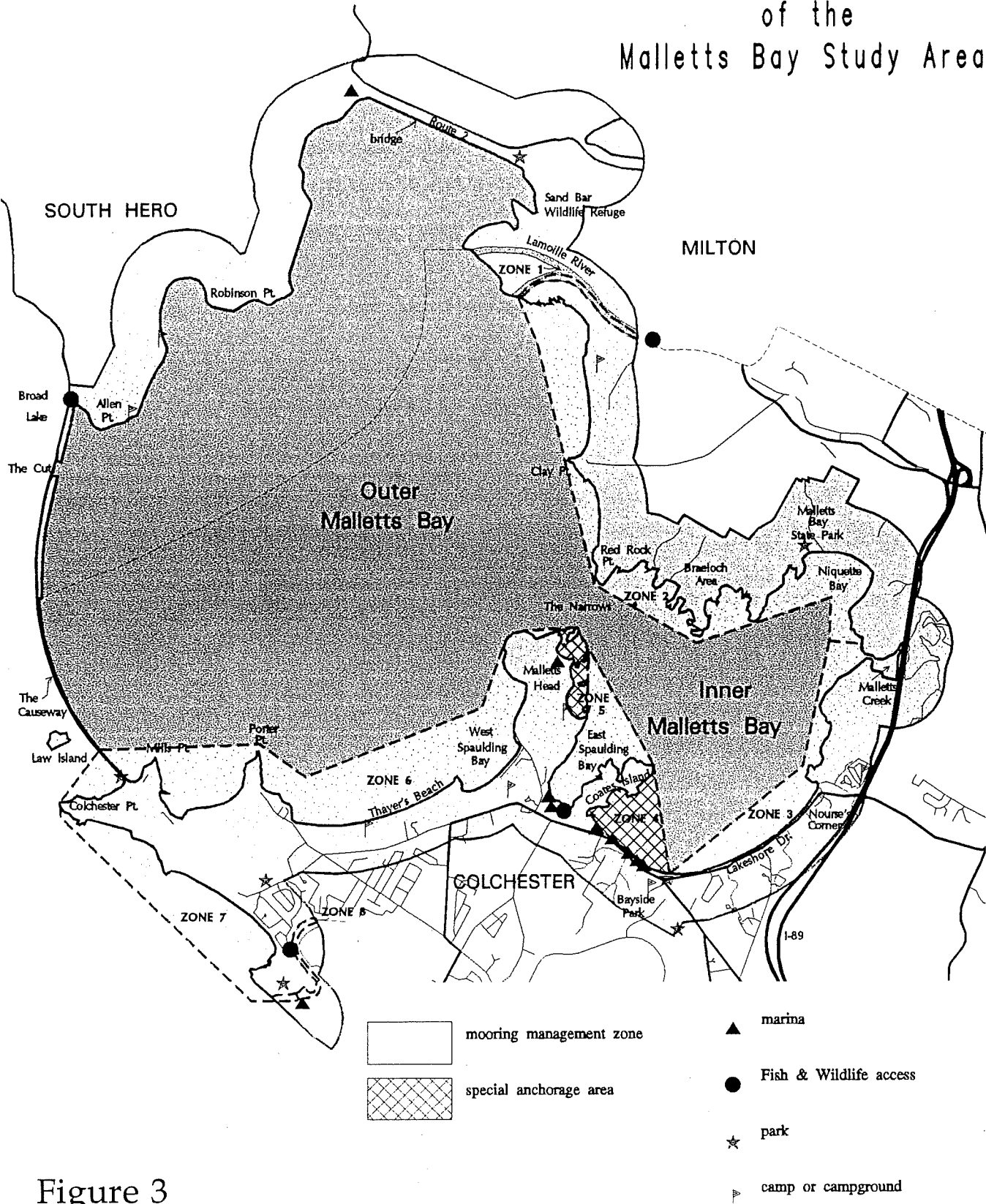


Figure 3

Table 1: Existing Recreation Facilities in and around Mallets Bay

The following is an extraction from the Lake Champlain Recreation Resources Inventory of those facilities located in or near Mallets Bay; revised by a Steering Committee member, 1995. Operator code: 1 State, 2 County, 3 City or Village, 4 Town, 5 Federal, 6 School Districts, 7 Quasi Public, 8, Private, 9 Commercial

VERMONT BOAT LAUNCHES

<u>Site Name</u>	<u>Operator</u>	# of <u>Cartop Launch</u>	# of <u>Paved Ramps</u>	# of <u>Gravel Ramps</u>	# of <u>Slips</u>	# of <u>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	
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>	# of <u>Cartop Launch</u>	# of <u>Paved Ramps</u>	# of <u>Gravel Ramps</u>	# of <u>Slips</u>	# of <u>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>	# of <u>Tent Sites</u>	# of <u>Vehicle Sites</u>	# of <u>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

Institutional Review and Analysis: Summary

A full report of the Institutional Review and Analysis is available for review under separate cover at the Colchester Town Office.

The following is a summary of the research documenting the federal, state and local laws, policies, rules, authority, etc. for:

- Authority to Create Plan.
- Overlapping Jurisdictions for Recreation Management.
- Recommendations to Resolve Overlapping Jurisdictions.
- Authority to Implement the Plan.
- Authority to Enforce the Plan.

Authority To Create Plan

As reviewed in the Lake Champlain Management Conference Annual Report, the development of planning and implementation authority on Lake Champlain has had a long evolution. Forty-five years ago, the issues surrounding Lake Champlain as a valuable regional resource were recognized and a joint Vermont - New York State Commission was set up to address regional planning issues for the Lake Champlain basin. By the 1970's a study of lake issues was undertaken by the New England River Basin Commission and led to a five year management plan in 1979. In 1988, Quebec joined Vermont and New York in a cooperative pledge to address the issues in the larger region. While the efforts to date were meaningful in recognizing the issues, they lacked the clout and funding to make real changes.

Finally in 1990, Congress passed the Lake Champlain Special Designation Act, which authorized the EPA to establish and fund a Lake Champlain Management Conference representing New York State and Vermont. Among other responsibilities, this Conference was authorized to prepare plans for the Lake, including demonstration projects. In the same year, the Vermont legislature, through its Act 265 authorized and mandated the Secretary of Natural Resources to develop surface use management plans for lakes and ponds 20 acres and larger in Vermont. This Malletts Bay Recreation Management Plan is a step to develop a localized high use area demonstration Plan that can become a learning experience and model for the development of other high use areas for Lake Champlain. The planning effort was approved for funding through the Management Conference.

Overlapping Jurisdictions for Recreation Management

Management of recreational resources and uses, the development of recreational and related facilities, and the implementation and enforcement of management strategies requires review and approval through an often confusing system of regulatory and enforcement agencies. Planning for such management, and realistically implementing a plan necessarily requires an understanding of this authority that comes from federal, state, and local levels.

Each of these governmental levels have jurisdiction over at least some of the recreational use activities, development of facilities, water quality issues, and enforcement.

Following is a summary which briefly identifies the overlapping jurisdictions in each these primary planning areas:

Recreational Use Activities: Institutions and Agencies

Federal

United States U.S. Coast Guard

The U.S. Coast Guard has authority to place and maintain navigational aids, and enforce federal boating laws. They may establish special anchorage areas where boats may anchor without night lights. They are also on call for anyone in distress on the waterway. The U.S. Coast Guard is active on Lake Champlain, based on the waterfront in Burlington, and regularly patrols Malletts Bay and assists local and State Police when necessary.

United States Fish and Wildlife Service

This agency provides assistance to fish and wildlife programs managed by the states of Vermont and New York through the Lake Champlain Fish and Wildlife Management Cooperative. The U.S. Fish and Wildlife Service also coordinates migratory bird management programs and enforces federal laws pertaining to fish and wildlife resources.

United States Environmental Protection Agency

The EPA through the Clean Water Act could prohibit activities that would cause undue pollution in the Bay.

State

Vermont Water Resources Board

The Water Resources Board plays an important role in the regulation of recreational uses. While the Agency of Natural Resources, with its professional and technical staff, has responsibility to implement the relevant rules and regulations, the Water Resources Board is a citizen Board which has the quasi-judicial authority to make rules and the authority to hear appeals of the regulatory decisions by the Agency.

Under the Vermont Statutes - Title 10 - 1424, the Board is enabled to manage the use of public waters. The Board may establish rules to regulate the use of the public waters by defining areas for certain uses, regulating the uses, and regulating the times various uses can be conducted. The Board may delegate authority for regulation of public waters to a municipality which is adjacent to or which contains the water.

According to the 1990 Zwick - Vermont Lakes and Ponds Recreation Management Study, "thirty eight water bodies have rules established by the Water Resources Board. Restrictions have included: 1) prohibition of motorboats; 2) prohibition or restrictions on particular recreational activities (i.e., water skiing); 3) prohibition on houseboats; 4) buffer, or protective, zones that limit speeds and distances boats must maintain around special areas or swimmers; 5) speed limits; 6) no wake zones; and 7) restrictions on docks and floats."

Given the nature and extent of this responsibility and authority, no single agency or board has greater potential control of recreational use than the Water Resources Board.

Vermont Department of Fish and Wildlife

This agency manages fish and wildlife resources through habitat management and protection, promotion of fish and wildlife-associated recreation, and public education, as well as establishing and enforcing fishing and hunting regulations. It is responsible for managing the Fish and Wildlife Access Areas and Wildlife Management Areas.

Vermont Department of Forests, Parks and Recreation

This agency is responsible for statewide recreation planning, and development and management of state recreation programs, including the Management Plan for Malletts Bay. The Department of Forests, Parks and Recreation is also responsible for the management of state parks, lands, and forests.

Vermont Department of Environmental Conservation - Wetlands Division

This agency can regulate uses and activity which would be detrimental to wetlands.

Vermont Water Quality Division

This agency permits encroachments such as marinas, docks, and seawalls.

Vermont Department of Motor Vehicles

This agency is responsible for developing and updating boating safety laws, rules, and regulations as well as registering motorboats.

Vermont State Police

This agency is responsible for enforcement of boating safety laws, marine search, and rescue.

Vermont Division for Historic Preservation

This agency is responsible (under 22 VSA 14) for underwater historic properties under all state waters, including Malletts Bay, and is responsible for maintaining the "Phoenix" Underwater Historic Preserve off Colchester Shoals.

Local**Town of Colchester**

The Town has considerable authority to impact the recreational use of the Bay. This authority comes in terms of the ability to police the uses on the Bay which are regulated by any laws. It also has authority from the mooring management responsibility it has accepted from the State, and from the land use control and other development control it can exercise around the Bay.

Harbor Police

The Town has authority to police the laws of the Town, the State, and the Federal government on the Bay. The Town exercises this authority and patrols in accordance with the intensity of activity. The Harbormaster is also responsible for coordinating emergency search and rescue efforts in Malletts Bay.

Mooring Management

The Town has applied for, and received, authority from the State of Vermont to manage moorings on the Bay. The Town may apply for additional control of surface uses in the Bay from the Vermont Water Resources Board. This delegation could transfer broad and significant authority regarding the management of the Bay.

Land Use and Development Controls

Most of the recreational uses on the Bay depend on land access and support facilities. The Town regulates the land uses which provide this support.

Jurisdictional Overlap for Recreational Use Activities

Three tiers of government laws, regulations, rules, and guidelines overlap and affect many recreational uses. A few examples can illustrate the point:

Power Boating - At the Federal level, power boating is regulated by navigational limitations set by the U.S. Coast Guard. Furthermore, operation and economics of these boats is influenced by EPA emissions and discharge standards. At the State, the Water Resources Board can set rules for the size of motors, the hours of use, and the locations where power boating is allowed. Fish and Wildlife fishing rules could also restrict power boat operation near fishing areas. Parks and Recreation through its planning efforts can identify areas of use regarding power boat usage. The Wetlands Division can restrict wakes from these boats. The Vermont State Police through its enforcement of boating safety laws can dramatically affect power boat use and operation. Finally, the Town police can set policies regarding this use and can influence areas of operation through its mooring management program.

Sailing - Sailing in the Bay could be very restricted by navigational decisions of the U.S. Coast Guard. For example, restricting the flow and direction of travel through the Narrows could affect general cruising sailing as well as restrict sailing races between the Inner and Outer Bays. The Water Resources Board could limit sailboat racing in very congested areas, such as the Inner Bay, if it determined that such formal uses as defined race courses were not compatible with a broad mix of other uses in confined areas. In addition, the Town could limit sailing activity by restricting the mooring of such boats.

In addition to directly regulating the uses, the multiple tiers of agencies can also affect these uses by controlling the development of the facilities that support these uses. This can be a very powerful tool in managing the recreation use and the degree of conflict and congestion in the Bay.

Development of Facilities: Institutions and Agencies

As opposed to regulating actual active uses, the related facilities to recreational uses can be controlled and influenced by many agencies. This control then impacts the uses which in many cases rely heavily on support facilities. For instance, if no boat ramps were allowed, there would in fact be much less use of the Bay.

Federal

United States Army Corps of Engineers

This is the primary federal agency with authority to regulate any work or structures which encroach in the Bay, as a navigable water, below the ordinary high water elevation of 98 feet. Their jurisdiction and authority is very significant. Rules are covered in detail in the Federal Register. The Corps also publishes a "Guide for Permit Applications" and "Are You Planning Work in a Waterway."

Under Section 10 of the Rivers and Harbors Act, it reviews applications for structures and work in navigable waters of the United States. This would cover piers and docks, wharves, weirs, booms, permanent mooring structures, bank protection, transmission lines, aids to navigation, any permanent or semi-permanent obstacles, dredging, fills, utility lines, reefs, breakwaters, boat ramps, and a broad range of other similar types of projects.

Under Section 404 of the Clean Water Act, it reviews fills, excavations, causeways, artificial islands, beach construction, and mechanized land clearing.

Under these two Acts, a dock would require only a Section 10 review, while a crib fill or wharf would require reviews under both Sections 10 and 404.

The Corps issues General Permits without much review that cover such items as small private docks. They also issue Nationwide Permits, which require more review than General Permits but which are still fairly routine. Some of these are classified as "non-reporting" for such items as a single mooring, certain maintenance, structures in anchorage areas, limited bank stabilization, minor dredging, and

clean up activities. "Reporting" permits are for such items as a sewage outfall structure, large bank stabilization projects, utility lines through wetlands, and certain temporary construction.

The Corps of Engineers is the clearinghouse for these projects and includes the review of any other federal agencies that it deems appropriate. Typically, this will include the EPA, the U.S. Fish and Wildlife Service, and the U.S. Coast Guard.

Corps of Engineers' permit requirements are very specific and detailed even to the extent of requiring odd sized paper for submission. A thorough permit is required to avoid delays.

United States Department of the Interior, National Park Service

This agency approves funding through state granting programs for recreation projects for acquisition and development.

State

Vermont Water Resources Board - Public Trust Doctrine

The Vermont courts have established that "the bed or soil of boatable lakes in this state is held by the people in their character as sovereign in trust for public uses for which they are adapted." Considerable controversy has surrounded these kinds of interpretations of the public trust doctrine. The Water Resources Board has taken a position in one of its recent cases that "the Vermont cases clearly establish the existence of a private right to reasonable use of the public waters." The issue surrounds the concept of use versus control, and the degree to which the use must be for public purposes. The Board has ruled that "most private activity has at least some public benefit" and this is the basis for allowing private activity.

Vermont Department of Environmental Conservation

DEC administers the Lakes and Ponds Shoreline Encroachment Program for the state through its Water Quality Division. It is authorized under Title 29, Chapter 11. The program covers a defined list of encroachments as well as a list of waived items. Waivered items include certain small docks, small water supply pipes, temporary structures required by low water, ordinary repairs and maintenance, duck blinds, floats, rafts and buoys. The agency publishes "Planning a Project on Your Lakeshore - What You Need to Know," and the DEC "Interim Procedures for the Issuance or Denial of Encroachment Permits." It is interesting to note that these procedures include a "Public Trust Determination" section but that this section has been omitted in the current version.

DEC also administers the Act 250 program for review of development projects. As the State clearinghouse for these projects, this review would engage all other appropriate state agencies in the review of a significant shoreland development. With regard to marinas, and other similar recreation oriented facilities, this program could have a strong role to play in recreation development. Criteria generally include consideration of water and air pollution, availability of water, burden on water supply, soil and land erosion, traffic, impact on educational service, municipal services, scenic and natural beauty, and conformity with local and regional plans and capital programs. The process can be very thorough, expensive, and time consuming.

Vermont Division for Historic Preservation

Review Act 250 permit applications under the "historic sites" aspect of Criterion 8. Can provide technical assistance to the town and developers on issues relating to historic and archaeological resources. Custodian for all underwater historic sites.

Vermont Department of Forests, Parks and Recreation

Responsible for the management of state parks and lands, and forestry resources.

Shoreline Zoning Enabling Legislation

This allows Towns like Colchester to adopt special zoning requirements along shorelines in the Town, but does not mandate such provisions.

Vermont Department of Fish and Wildlife

This department manages the fishing access areas and wildlife management areas. Responsible for fish and wildlife habitat protection and management.

Local

Town of Colchester

While the Town cannot regulate the development of facilities beyond the 95.5 ft. contour, except for moorings, it does have considerable authority to impact the development of related on shore facilities. This authority comes from the land use control and other development control it can exercise around the Bay. By controlling land use and development of public facilities, such as sewer, water and roads, the Town takes a strong role in determining the development of facilities that are otherwise regulated by the state and federal agencies.

Jurisdictional Overlap for the Development of Facilities

Again, the tiers of government authority can have a major impact on the reality of constructing or improving facilities. Most facilities at or beyond the water's edge will face a long list of these regulations and review. Virtually every conceivable issue will be addressed by one of the reviewing agencies.

Marinas

For instance a marina could require approvals from almost every agency. The Corps of Engineers would review the docks, the shoreline protection, the moorings, the dredging, etc. The Water Resources Board might consider the Public Trust Doctrine. The use of the water surface and the use of the lake bottoms could be conceivably restricted or rejected under this doctrine. DEC would review and possibly permit all the waterfront related construction under the Lakes and Ponds Encroachment Program, in addition to the requirements of the Corps of Engineers. It would also likely review the project under Act 250 with all ten of its primary criteria and many secondary issues. Depending on the site, other agencies such as Historic Preservation might have a role. Finally, the Town of Colchester would review the project under its zoning and land use rules.

Mooring Areas

The U.S. Coast Guard would review mooring areas as special anchorage areas. The Corps of Engineers would require a permit for public and private mooring fields. While the State doesn't actively utilize its authority to regulate these mooring areas, it could decide to do so, or it could use the Public Trust Doctrine to rule on the regulation of these facilities. The Town of Colchester under its current authority can also regulate, permit, and control these facilities.

Water Quality: Institutions and Agencies

Federal

United States Environmental Protection Agency

The EPA administers the Clean Water Act - Public Law 92-500. This act started the Clean Lakes Program, which includes authority from investigative studies to implementation and funding of restoration programs.

United States Soil Conservation Service (SCS)

The SCS addresses and assists in managing agricultural projects to prevent or reduce impacts on water quality from agricultural activities.

State

Department of Environmental Conservation

DEC administers the EPA Clean Water Program under the Clean Water Act. They set water quality standards, engage in water quality studies, deal with marine nuisance control, monitor water quality, provide financial assistance, and manage the sewage treatment program.

Local

Town of Colchester

The Town administers a health and safety ordinance to regulate water supply and sewage disposal. The Bay is used for private water supply. Without public sewers in the Town, management of this program is critical to the water quality of the Bay.

Jurisdictional Overlap for Water Quality

The overlap of jurisdictions for water quality is not much of an issue except as relates to the input to the permit review process for each of the agencies.

Enforcement: Institutions and Agencies

Federal

United States Coast Guard

As noted above, the U.S. Coast Guard has federal police power to enforce federal boating and navigational rules and regulations.

State

Vermont Department of Public Safety - Marine Division of State Police

The State Police patrol the Bay and enforce boating safety laws.

Vermont Department of Fish and Wildlife

This Department enforces fishing and hunting laws and regulations.

Local

Colchester Police

The Harbormaster, as a member of the town police force, is authorized to enforce all applicable laws on the Bay, and is responsible for coordinating emergency and search and rescue efforts.

Jurisdictional Overlap for Enforcement

The overlap for enforcement is not a problem and probably helps to provide a basic means of coverage which otherwise might not be able to be provided by any one jurisdiction itself.

Other Organizations

The Lake Champlain Management Conference/Lake Champlain Basin Program - As noted in Section A, above, this group was charged with developing a pollution prevention, control, and restoration plan for Lake Champlain. The work has been and continues to be funded to cover research and monitoring, project administration, and project planning and demonstration. Additional requirements for recreation use and facilities will probably evolve from this process.

Recommendations To Resolve Overlapping Jurisdictions

There are several concepts that can be foreseen as potentially useful in cutting through the problems associated with overlapping jurisdictions. However, an important issue is that the governmental levels at work here each represent a different level of constituency, perspective, and responsibility, and while the criteria may be similar, there may not be a willingness or an appropriateness to give up that representation. For example, the federal government agencies take a broad regional and national perspective based on national issues. Although the Town may support some of the national ideals, it also may not choose or be able to relate effectively to such broad concerns, and vice versa. The crowding at a local launch site is not appropriately a national issue. It may be short sighted to limit or combine any of these regulatory programs.

First, since the recommendations of the Plan are to limit some uses, development, or activities, the overlapping jurisdictions may help to do just that. The problems with facing the confusion and detailed requirements of the overlapping processes may serve as a deterrent to over developing the Bay. However, since the Plan does propose to provide for certain use, development, or activities, then a method to ease the way through the bureaucracy may be necessary for orderly and timely implementation. An achievable scheme would be to leave the official overlap in place, but provide a single comprehensive map through the system. Rather than have each agency or authority simply refer participants to the various other known parties in some random order, one entity would prepare, maintain, and explain the complete list of requirements from the multiple jurisdictions. An applicant would start and end with this entity. This entity wouldn't be expected to provide all the review but would put all the rules and procedures in one document as a guide. An applicant or participant in the process would then be able to prepare everything likely to be needed and follow through with less confusion. For example, list the federal and state boating requirements in one document so a boater will know that he/she will meet a U.S. Coast Guard inspection as well as a State Police inspection.

Further resolution of the overlap may be found in transferring responsibility. As the Water Resources Board may transfer authority and jurisdiction, so may other agencies be able to transfer authority when it can be shown that one jurisdiction can and will handle the additional responsibility in the interest of the transferring agency.

Authority to Implement the Plan

Generally, implementation will come through: 1) voluntary measures encouraged by natural forces or new rules or incentives, and 2) through the regulatory enabling legislation affecting the various agencies involved.

For example, if a new marina is planned, the natural economic forces may encourage the implementation of such a marina and may define its facilities, and given some encouragement or actual rule changes by the public agencies involved, the marina project may develop without an outside mandate.

In other cases, such as if an actively existing use is to be prohibited, the police powers of enforcement may be required to implement the plan.

Authority to Enforce the Plan

Where the authority exists to require implementation, the police powers generally exist to enforce implementation. This may include U.S. Coast Guard, State Police, Harbor and Town Police, enforcement staff, agents, wardens, and all with the back up of the agencies to file formal legal steps toward implementation through the courts, if necessary.

Review of Relevant Studies and Programs: Summary

Introduction

This report is a summary of the review of plans and studies relevant to the development of the Malletts Bay Recreation Management Plan. A full report is available for review under separate cover at the Colchester Town offices. This summary is formatted by the issues that appeared repeatedly in the documents. The documents reviewed are all listed in the Reference.

The issues are:

- Boating Safety and Enforcement, Crowding, Congestion and Conflicts.
- Public Access.
- Cultural Heritage Resources/Tourism.
- Natural Resources Protection: Water Quality.
- Nuisance Aquatic Plants and Animals
- Natural Resources Protection: Fish, Wildlife, and Wetlands.
- Marinas, Moorings and Docks.
- Shoreland Development/Land Use.
- Comprehensive Water Management and Funding.

Information regarding each issue is further formatted as below:

Existing Programs

Recommendations from Vermont Studies

Recommendations from Other Studies:

A separate category is included at the end which summarizes information about Malletts Bay as gathered from relevant documents.

Issue: Boating Safety and Enforcement, Crowding, Congestion and Conflict.

Existing Programs:

- Courtesy Boat Inspections: U. S. Coast Guard and State Police for compliance with boat safety equipment and maintenance.
- Boater Safety Education Program: offering Boater Safety Course (required for anyone born after 1 Jan. 74 to operate a boat with a motor over 6 h.p.).
- Harbormaster Program through Town of Colchester: educate and enforce on safety and health hazards, and to coordinate emergency response.

Recommendations

from Vermont Studies:

Source:

Education

- Boating safety course.
- Education programs for small boat operators.
- Boat safety booklets and bulletin boards.

Allocation and Management of Vermont Lakes, 1982
Opportunities for Action, 1994
Vermont Boating Study, 1979

Allocation and Management of Vermont Lakes, 1982

- Education on appropriate near shore behavior, respect private property.
- Identify navigational hazards, channels, fairways, update charts.
- Comprehensive boating education.

Allocation and Management of Vermont Lakes, 1982
State of the Lake , 1990
1993 Vermont Recreation Plan

The Lake Champlain Rec. Public Involvement, 1994

Regulations

- All boats using water 30 days or more be required to be registered on a progressive fee schedule; include canoes and kayaks.
- Mandatory license and boating safety course.
- Children under 16 should not be allowed to operate a power boat without a licensed operator aboard.
- Clarify jurisdictions.

Harbors, Marinas, and Mooring Report, 1989
1993 Vermont Recreation Plan

1993 Vermont Recreation Plan
Lakes and Ponds Task Group, 1980
Lakes and Ponds Task Group, 1980

Lakes and Ponds Task Group, 1980

Enforcement

- Expand "courtesy patrols."
- Increase enforcement to match increased activity.
- Department of Public Safety delegate enforcement to local enforcement on small lakes and ponds.
- Increase enforcement in high use areas.
- Evaluate consistency of enforcement.

Allocation and Management of Vermont Lakes, 1982
1993 Vermont Recreation Plan
Lakes and Ponds Task Group, 1980
Allocation and Management of Vermont Lakes, 198
Lakes and Ponds Task Group, 1980

The Lake Champlain Recreation User Survey, 1994
Opportunities for Action, 1994

Planning

- Recreational utilization plans for heavy use areas, surface use zoning, monitoring.
- Coordinate lake and shoreline management.
- Town of Colchester should reestablish the Harbor Commission.

Vermont Boating Study, 1979
Allocation and Management of Vermont Lakes, 1982

Allocation and Management of Vermont Lakes, 1982

Bayshore Committee, 1987

Recommendations from Other States:

New Hampshire - Office of State Planning.

- Adopt a three zone plan.
 - Near shore "quiet zone" 250' out from shoreline.
 - Wildlife protection zone - additional 250' (total 500' from shore) where known critical habitat.
 - General activity zone - with speed limits and types of use specified.
 - Consider time-use zones.
 - Develop boater-licensing system.
 - Long range plan to reduce size, speed, and power of boats.

Massachusetts - Nantucket

- Develop harbor chart.
- Enforce Harbor safety laws.
- Prohibit commercial rentals of personal watercrafts.

- Water Use Zoning/Classifications:
 - conservation use
 - low intensity use
 - high intensity use
 - multipurpose use
 - commercial use
 - navigational channels use

New York - Lake George

- Delegate enforcement to Park Commission.
- Establish lake's boating capacity relative to facilities and resource management.
- Enforce State's drunken boat driving law.
- "No-wake" zones in bays and narrow channels.
- Lakewide speed limit: 45 mph day time, 25 mph nighttime.

Delaware - Inner Bays

- Monitor "hot spots" for future safety concerns.
- Water surface zoning.
- Increased enforcement at "hot spots."
- Strengthen boater safety education efforts.
- Education and legislation to address personal watercraft use.
- Educational displays at key location.

Arizona/Utah - Lake Powell

- Used 9 acres of open surface water per boat as safe boating guideline.

Issue: Public Access

Existing Programs:

Boat Launches

Vermont Department of Fish and Wildlife does not presently have plans for another boat launch in Malletts Bay.

Existing Fish and Wildlife boat launches directly or indirectly serving Malletts Bay:

Paved Access:

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

Gravel Access:

- Sand Bar State Park

Cartop Launching:

- Marble Island Resort

Boat Accesses at Marinas or Campgrounds:

Paved Access:

- Champlain Club
- Malletts Bay Boat Club

Gravel Access:

- Brown Ledge Camp
- Malletts Bay Campground

Cartop Launch:

- Marble Island Resort

Parks

Airport Park, Bayside Park, Causeway Park, Malletts Bay State Park

Beaches

Public Beaches: Sand Bar State Park, Bayside Park

Commercial Beaches: Brown Ledge Camp, Malletts Bay Campground and Marble Island Resort

Fishing Sites

Public: Lamoille River Fish and Wildlife Access, Sand Bar State Park, Bayside Park, Causeway Park, Windemere Fish and Wildlife Access, Heinenberg Access.

Recommendations

from Vermont Studies:

Source:

Additional Accesses

- General boat access, launching/day user areas, boat parks with extensive facilities on larger lakes, beaches, fishing piers, parks and trails.
- Towns purchase shoreline properties, build lakeside walking and biking paths.

Vermont Boating Study, 1979

The Lake Champlain Recreation User Survey, 1994

The Lake Champlain Rec. Public Involvement, 1994

Opportunities for Action, 1994

The Lake Champlain Recreation User Survey, 1994

Improve Existing Accesses

- Upgrade ramps, sanitary facilities, area lights, trash receptacles, sufficient parking, attendants on busy days.
- Accessible to people with disabilities.
- Improve visibility of sites.
- Fish and Wildlife to explore feasibility of utilizing fishing accesses for recreational access and other recreation uses.

Vermont Boating Study, 1979

Harbors, Marinas, and Mooring Report, 1989

Lakes and Ponds Task Group, 1980

The Lake Champlain Rec. Public Involvement, 1994

Opportunities for Action, 1994

The Lake Champlain Rec. Public Involvement, 1994

Lakes and Ponds Task Group, 1980

Lakes and Ponds Task Group, 1980

Comprehensive Public Access Strategy

- Involving regional partnerships, a dedicated trust fund through fees and fines, and adopt-an-access.
- Identify needs and opportunities prioritize, research funding potentials, implement.

State of the Lake, 1990

1993 Vermont Recreation Plan

Lakes and Ponds Task Group, 1980

Opportunities for Action, 1994

1993 Vermont Recreation Plan

Public Information on Accesses

- Public information about access sites at: tour offices, private business, sent with boat registration.
- Public information on accesses for persons with disabilities.
- Signs at sites informing of appropriate use.
- Redirect boaters from overcrowded sites to under-utilized facilities.

Lakes and Ponds Task Group, 1980

1993 Vermont Recreation Plan

The Lake Champlain Recreation User Survey, 1994

The Lake Champlain Recreation User Survey, 1994

Recommendations from Other States:

New Hampshire - Office of State Planning.

- Expand definition of "public" access to include non-state areas that are available to the general public for access.
- One public access point for each 5 miles of shoreline or for every 1,000 acres of surface waters.

Funding:

- Increased boat registration fees.
- \$10 million bond for a 20 year access program.
- Golden Passport Program - for residents.
- Uniform User Fee Program.
- Decal Program - valid for given time period.
- Operator Licensing.
- Permit Fee for out-of-state boaters.
- Non-boater User Fee.

Massachusetts - Nantucket Plan.

- Require public access on all new and expanding waterfront development.
- Pursue aggressive open space and right-of-way acquisition program.
- Signs at all public access sites.
- Develop coastal access guide and map.
- Standards for Waterfront Overlay District to ensure development will not interfere with public access.

Delaware - Inland Bays.

- Priorities for boating accesses shall be given to launch ramps over marinas due to public preference and concerns regarding environmental impacts of marinas.

Issue: Cultural Heritage Resources/Tourism

Existing Programs:

- Department of Tourism programs, Scenic Byways potential.
- Lake Champlain Paddler's Trail - in planning.
- Lake Champlain Bikeway - in planning.
- Underwater Preserve Systems.
- Colchester Lakeshore Redevelopment Committee.

Recommendations

from Vermont Studies:

Source:

- | | |
|---|---|
| • Develop region-wide GIS data base with uniform guidelines for assessment of cultural resources. | <i>1993 Vermont Recreation Plan</i> |
| • Implement a cultural resources management plan. | <i>1993 Vermont Recreation Plan</i> |
| • Develop guidelines for managing tourism. | |
| • Promote Lake Champlain as a total package. | <i>Opportunities for Action, 1994</i> |
| • Develop public education materials, interpretive information. | <i>1993 Vermont Recreation Plan</i> |
| • Develop a marketing plan | <i>The Lake Champlain Rec. Public Involvement, 1994</i> |

- Encourage eco-tourism
- Expand tourism facilities.
- Develop tourism opportunities: hiking, biking, beach and picnic areas.
- Provide a central tourist information center.
- Emphasize sustainable recreation opportunities: trails, bikeways, paddlers trail.
- Educate tourists of wise use of resources.
- Promote designation of scenic byways in area.
- Develop a comprehensive guide to all public access.
- Expand lakewide historic underwater preserve.

The Lake Champlain Rec. Public Involvement, 1994
Opportunities for Action, 1994
Opportunities for Action, 1994
The Lake Champlain Recreation User Survey, 1994
Opportunities for Action, 1994
The Lake Champlain Rec. Public Involvement, 1994
Opportunities for Action, 1994

The Lake Champlain Rec. Public Involvement, 1994

Opportunities for Action, 1994

Opportunities for Action, 1994

The Lake Champlain Rec. Public Involvement, 1994
Opportunities for Action, 1994

Recommendations from Other States:

Massachusetts - Nantucket

- Downtown Waterfront District
 - Zoning Bylaws - Harbor overlay zones.
 - Design guidelines.
 - Identify scenic views.
 - Provide incentives for water dependent uses.

Issue: Natural Resources Protection Water Quality

Existing Programs:

Federal Water Quality Programs

- Clean Water Act - Section 314 established Clean Lakes Program (CLP). Money is channeled to State through four types of cooperative agreements:
 - Lake Water Quality Assessments - 50% federal funding.
 - Diagnostic/Feasibility Studies - 70% federal funding.
 - Implementation Fund - 50% federal funding, requires match.
 - Monitoring Grants - up to \$125,000/project, requires 30% match.
- Clean Water Act - Section 314(h) provides federal funding for Nonpoint Source Pollution Program.

State Water Quality Programs

- Vermont Lakes and Ponds Program - provides structure and subprogram:
 1. Monitoring and Surveillance: Spring Phosphorous Program, Lay Monitoring Program, Aquatic Plant Survey Program, Cooperative Bacteriologist Sampling Program, Acid Precipitation Program, Long-Term Lake Monitoring Program.
 2. Special Studies: Diagnostic Studies, lake modeling, and planning and management studies.
 3. Management and Restoration.
 4. Protection: monitoring and surveillance, public education, and regulation. Vermont Water Quality Standards are the heart of the regulatory programs.

- Water Pollution Control through 10 VSA Chapter 47 prohibits the discharge of any wastes into Vermont waters without a permit.
- Control of nonpoint source pollution through voluntary federal programs.
 - USDA Agriculture Stabilization and Conservation Service (ASCS).
 - USDA Natural Resources Conservation Service (NRCS).
- Vermont Agricultural Nonpoint Source Program.
- Vermont Department of Agriculture recently revised their Accepted Agricultural Practices (AAP's), will include:
 - income tax credit incentives.
 - State cost sharing for best management practices (BMP's).
- Vermont Department of Environmental Conservation administers the Lake Champlain Monitoring Program.

Town Water Quality Control Programs. (Colchester)

- Water Quality Coordinator monitoring Inner Malletts Bay.

Recommendations

from Vermont Studies:

Source:

Boating Related

Harbors, Marinas, and Mooring Report, 1989

- Study water quality impact of marinas.
- Educate on fish consumption advisory programs, conduct fish sampling.
- Prohibit residential use of boats on waterbodies without pumpout facilities.
- Enforce holding tank laws.
- Enforce greywater discharge laws.
- Ban boat paints with tributyl tin (TBT).
- Make severe penalties for polluting and vigorously enforce.
- Grant program through Clean Vessel Act for pumpout facilities.

1993 Vermont Recreation Plan

Land Related

- Towns conduct sanitary surveys of septic systems failures, enforce repairs, pass a sewer disposal ordinance.
- Towns to participate in the On-Site Sewage Program.
- Educate homeowners to maintain septic system, regularly pumpout holding tanks, avoid pesticides, herbicides, and products with phosphorous, properly dispose of household wastes.
- Implement hazardous waste disposal programs.
- Public education on pathogenic contaminants for swimming at non-public beaches.
- Cost-share and tax rebates for vegetative buffer strips.

State of the Lake, 1990

Malletts Bay Water Quality, 1993

Lakes and Ponds Task Group, 1980

State of the Lake, 1990

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

- Develop and implement phosphorous reduction strategy. *1993 Vermont Recreation Plan*
- Require best management practices for road construction and maintenance. *1993 Vermont Recreation Plan*
- Enforce State Water Quality Standards. *State of the Lake, 1990*
- Upgrade monitoring program. *State of the Lake, 1990*
- State to review discharge permits. *State of the Lake, 1990*
- State to aid communities to install and upgrade sewage treatment plants. *State of the Lake, 1990*

Malletts Bay

- Develop protection/preservation plan for Malletts Bay. *Bayshore Committee, 1987*
- Malletts Bay Water Quality Coordinator to work with school curriculum. *Malletts Bay Water Quality, 1993*
- Year-round position for Malletts Bay Water Quality Coordinator. *Malletts Bay Water Quality, 1993*

Recommendations from Other States:

New Hampshire

- Develop long-term monitoring program.
- Identify "hot spots."
- Amend zoning ordinances:
 - Shoreland overlay district requiring vegetative buffers, building setbacks, and discourage use of herbicides, pesticides and fertilizers.
 - Prohibit development on slopes > 25%.
 - One acre minimum lot size with 200' shore frontage.
 - List prohibited land uses that threaten water quality.
 - Require vegetative open swales rather than storm drains.
 - Create uniform rock salt management.
 - Lake ecology education programs.

Massachusetts

- Monitor, identify and resolve water quality problems.
- Public education - distribution, curriculum in schools.
- Boat Pollution Abatement - include no discharge areas; enforce use of pumpout facilities, provide trash and recycling barrels.
- Nonpoint Pollution controls: endorse existing rules, adopt new bylaws to minimize residential uses of herbicide, fertilizer, pesticides, designate critical habitat protection area.

Issue: Nuisance Aquatic Plants and Animals

Existing Programs:

- Aquatic Nuisance Control Program - State program that has focused primarily on Eurasian milfoil and water chestnuts.
- Sea Lamprey Control Program.
- Mussel Watch Program: Two locations being monitored in Outer Malletts Bay and one Preliminary Watch Site in Inner Malletts Bay.

Recommendations

from Vermont Studies:

Source:

- | | |
|---|---|
| • Continue and develop monitoring programs. | <i>1993 Vermont Recreation Plan</i> |
| • Develop comprehensive management programs for each species. | <i>1993 Vermont Recreation Plan</i> |
| • Educate public. | <i>1993 Vermont Recreation Plan</i> |
| • Continue and enhance Aquatic Nuisance Control Program. | <i>1993 Vermont Recreation Plan</i>
<i>Lakes and Ponds Task Group, 1980</i>
<i>The Lake Champlain Rec. Public Involvement, 1994</i> |

Issue: Protection of Natural Resources, Fish and Wildlife, and Wetlands

Existing Programs:

Fish and Wildlife Programs

- Lake Champlain Fish and Wildlife Management Cooperative between New York and Vermont - focus has been primarily on salmonid population.
- Vermont Department of Fish and Wildlife: manages fish hatcheries, manages list of State threatened and endangered species, sets game harvest regulations.
- Natural Heritage Program - surveys, protects, and teaches about endangered species and the State's significant natural areas.
- Land and Water Conservation Fund - financial assistance for acquisition and development projects, including recreation areas, parks, and natural resources, requires 50% match.
- Lake Champlain Wetlands Acquisition Strategies - identifies, prioritizes, and acquires significant wetlands within the Basin.

Recommendations

from Vermont Studies:

Source:

Fish and Wildlife

- | | |
|---|---|
| • Inventory habitats and protect. | <i>State of the Lake, 1990</i> |
| • Place signs at critical habitats and identify in pamphlets. | <i>Lakes and Ponds Task Group, 1980</i> |
| • Use indicator species to monitor ecosystem health. | <i>1993 Vermont Recreation Plan</i> |
| • Coordinate endangered species strategies. | <i>1993 Vermont Recreation Plan</i> |
| • Work with landowners to enhance critical habitats. | <i>1993 Vermont Recreation Plan</i> |
| • Monitor effects of toxic substances. | <i>1993 Vermont Recreation Plan</i> |

- Educate on fish and wildlife resources, use public television.
- Identify loon nesting and fish spawning areas, review small pond rules to ensure protection.
- Continue Lamprey Control Program.

Lakes and Ponds Task Group, 1980
The Lake Champlain Rec. Public Involvement, 1994
Lakes and Ponds Task Group, 1980

Lakes and Ponds Task Group, 1980

Wetlands

1993 Vermont Recreation Plan

- Coordinate wetlands regulations.
- Establish mitigation banking system.
- Continue funding for Lake Champlain Wetlands Acquisition Strategies.
- Provide financial incentives and technical assistance for landowners to protect wetlands.
- Inventory wetlands.

Recommendations from Other States:

New Hampshire

- Wildlife protection zone extending 500' from shore where there are critical habitats.
- Create and adopt wetland, floodplain and aquifer overlay districts.
- Revise subdivision regulations for protection of wildlife habitat and natural resource areas.
- Encourage "Current Use" applications donating and selling conservation easements.

Massachusetts

- Open Space plan requires development be sited to protect unique and fragile landforms.
- Published materials: environmentally sound, construction, maintenance and storage practice.
- Performance standards for siting and design of docks and piers.

Delaware

- If environmental officers determine larger boats and engines cause greater damage - control boat and engine size.
- Criteria needed for assessing sensitive habitats and establish off-limit zones.
- Create greenways.

Issue: Marinas, Moorings, and Docks

Colchester Zoning By-Laws:

- Residential marina associations, marinas, and yacht clubs:
 - Shoreline frontage - minimum 150'.
 - Marinas and Yacht Clubs - only limitation on # of berths is they must have one parking space per boat berth.
 - Residential marina associations - must have 150' of shoreline frontage for 5 boats, and 30' for every additional boat.
 - Pumpout facilities required if accommodating boats with sleeping facilities.
- Shoreline facilities/structures
 - Piers, docks, and other facilities shall not exceed 800 sq. ft. or extended more than 150' into the lake.
 - Boathouses to be placed at least 2' above the mean water level.

Colchester Regulations: Vessels, Mooring, and Waterways. (awaiting approval of Water Resource Board)

- Every mooring required to have a permit.
- Mooring applications to be processed on first come, first serve basis. (Town voted this down in 1995, unclear plans for regulations at this point.)
- Approved access to a mooring: Direct ownership of land, written approval of property owner, legal access across a parcel, legal municipal and state waterfront.
- Access point must be within 1000' of moorings.
- Moorings prohibited where actual or potential adverse impacts on:
 - Recreational and other uses of the water (including water supply).
 - Class I and II wetlands, endangered plant and animal species, fish or wildlife, public lands and natural scenic areas.
- Harbormaster may prohibit new moorings in MMZ 1, 5 and 6 until May 30 of the year following adoption of the management plan.

Existing Programs: (No known existing programs for marinas, moorings, or docks.)

- Vermont Department of Environmental Conservation - encroachment permits.
- Army Corps of Engineers - marina and encroachment permits.

Recommendations
from Vermont Studies:

Source:

Marinas

- | | |
|---|---|
| • Develop Act 250-like criteria for marina development, specific criteria, guidelines, policies and goals for development of marinas. | <i>Harbors, Marinas, and Mooring Report, 1989</i> |
| • ANR State policy on marina development. | <i>Lakes and Ponds Task Group, 1980</i> |
| • State should develop a plan identifying suitable areas for new marinas and for expansions. | <i>1993 Vermont Recreation Plan</i> |
| • Recognize service, but put limits on surface use. | <i>Vermont Boating Study, 1979</i> |

Moorings

- | | |
|--|---|
| • State should identify special anchorages and future mooring areas. | <i>Harbors, Marinas, and Mooring Report, 1989</i> |
| • Identify environmentally-sensitive areas and prohibit mooring and anchoring. | <i>Harbors, Marinas, and Mooring Report, 1989</i> |
| • Require permits for all moorings in mooring management zones and groupings of three or more. | <i>Vermont Boating Study, 1979</i> |
| • Develop specific plans for mooring facilities. | <i>Vermont Boating Study, 1979</i> |
| • Commercial: require adequate parking, pumpout facilities, traffic channels. | <i>Allocation and Management of Vermont Lakes, 1982</i> |
| • Private: Regulations for 5 or more moorings, limits to extension of property lines. | <i>Allocation and Management of Vermont Lakes, 1982</i> |
| • Fish and Wildlife should identify shoreline fishing areas and prohibit mooring in these areas before May 15. | <i>Harbors, Marinas, and Mooring Report, 1989</i> |

- Restrict moorings to within 500' of shoreline. *Harbors, Marinas, and Mooring Report, 1989*
- Create "no-wake" zones in designated mooring areas. *Harbors, Marinas, and Mooring Report, 1989*

Recommendations from Other States:

New Hampshire - High use water bodies.

Special mooring regulations for water bodies with high use.

- Application for mooring permit:
 - Proof of boat registration.
 - Legal access over land to mooring.
 - Proof that mooring will not be sold or leased (except in congregated mooring field).
- Moorings prohibited where:
 - constitutes a hazard to public safety.
 - presents unreasonable adverse environmental effects.
 - unreasonably interferes with other recreational uses.
- Individual moorings no more than one per shorefront property.
- Special exceptions can be granted for 2-4 moorings (small mooring site.)
- Public Mooring Fields.
 - 50% of moorings for short-term use, less than 30 days.
 - Must have public access and operator.
 - No membership fee permitted.
- Congregation Mooring Field:
 - 5 or more moorings dedicated to a homogeneous group.
 - Minimum 100 feet shoreline.
 - May not extend beyond 150' from shore or within 300' of public swimming area.

Massachusetts - Nantucket

- Establish mooring fields and anchorages with:
 - Designate overflow anchorage areas.
 - Larger boats (20'+) to water deeper than 6'.
 - Avoid infringing on federal and local navigation channels and fairways.
- Consider user classifications for moorings and adjust fees to reflect.

New York - Lake George

- Public lands under water are leased to upland owners for development of substantial docks and wharves.
- Lake frontage used to determine allowable number of docks: 100' = 1 dock, 101'-250' = 2 docks, 251'-500' = 3 docks.
- Docks extend no further than 40' offshore and no larger than 200 sq. ft.
- One mooring per upland parcel - mooring to be placed no further than 100' from shoreline.
- Commercial lots allowed four moorings for up to 500' of shoreline plus one mooring for every additional 100'.
- DEC delegates authority to Park Commission.
- Specific restricted use zones established with no or limited mooring or anchoring permitted.

Arizona/Utah - Lake Powell

- Marinas are only source of access.
Determine carrying capacity and control boating activity by putting limits on marinas.

Issue: Shoreland Development/Land Use

Town Regulations:

- Wetland Floodplain District with restrictions on appropriate uses.
- Shoreland Overlay district extends 500' inland with regulations regarding appropriate uses and structures, tree cleaning, and building and septic systems setbacks.

Existing Programs:

State Programs

- Shoreland Zoning Act authorizes towns to implement shoreline zoning.
- Lake Protection Program - distributes "Shoreland Zoning Options for Towns" and "Planning for Lake Water Quality Protection" manuals.

Recommendations

from Vermont Studies:

Source:

Study cumulative impacts.

1993 Vermont Recreation Plan

Educate

- Educate on shoreland values and protection: School curriculum, distribution of educational sheets on shoreland conservation to land trusts and land conservation groups, develop slide shows, videos, speak at civic group meetings, hold events to highlight shoreland issues.
- Conduct demonstration projects.
- Distribute Planning Guide for Lake Champlain.
- Educate on best management practices for shoreland development, shoreland protection structures, restoration and maintenance.
- Develop a model shoreland management plan.

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

Shoreland Zoning

- Develop guidelines for Lakeshore Zoning.
- Revitalize Shoreland Zoning Act.

1993 Vermont Recreation Plan

State of the Lake, 1990

Allocation and Management of Vermont Lakes, 1982

State of the Lake, 199

Planning

- Support local watershed planning efforts.
- Integrate shoreland and water quality protection in transportation planning, engineering and maintenance.
- Continue active protection of shorelines through purchase of land, easements, and development rights.

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

1993 Vermont Recreation Plan

Lakes and Ponds Task Group, 1980

- Provide technical assistance and training for groups working with landowners regarding legal options for protecting shorelands. *1993 Vermont Recreation Plan*
- Develop overlay district of shoreline area to address access, environmental inputs, improved scenic controls, improved transportation coordination of land uses. *Bayshore Committee, 1987*
- Develop standards for shoreline developments. *Bayshore Committee, 1987*
- Develop Act 250 and 200 aesthetic shoreland standards. *Lakes and Ponds Task Group, 1980*
Bayshore Committee, 1987

Funding

- Provide public funding and financial incentives for best management practices. *1993 Vermont Recreation Plan*

Issues: Comprehensive Water Management and Funding

Existing Programs:

State Programs

- Lakes and Ponds Program
- Water Resources Board
- Lake Champlain Basin Committee - participants and the myriad studies, particularly the draft "Opportunities for Action."

Non-Profit

- Lake Champlain Committee - focuses primarily on water quality.

Town Programs

- Malletts Bay Commission
- Town Planner
- This ongoing study: Malletts Bay Recreation Management Plan.

Recommendations

From Vermont Studies:

- Water Resource Board should continue as central to water management.
- Develop a Water Resource Management Fund to receive all boating related fees and taxes to be used for enforcement, education, capacity studies, development of facilities, and water quality/ environmental conservation.

Source:

Allocation and Management of Vermont Lakes, 1982

Harbors, Marinas, and Mooring Report, 1989

- Implement state-wide lake typology, Use of Public Waters. *Statewide Lakes and Ponds Recreation in VT 1994*
- Continue Lakes and Ponds Recreation Management Program. *1993 Vermont Recreation Plan*
- Assist communities to develop management plans for high use bays. *1993 Vermont Recreation Plan*
Lake Champlain Boat Study, 1993
The Lake Champlain Rec. Public Involvement, 1994
Opportunities for Action, 1994
VT Lakes & Ponds Recreation Management Study '90
- Utilize Visitor Impact Management process for determining impacts, identifying resources needing protection, and for prioritizing of management actions. *The Lake Champlain Rec. Public Involvement, 1994*
- Discuss myriad views of different recreation groups. *The Lake Champlain Rec. Public Involvement, 1994*
- Involve local government and grassroots groups in recreation planning. *Bayshore Committee, 1987*
- Establish a Colchester Shoreline Commission.

Information about Malletts Bay Sources

Population

- The population of the Malletts Bay zone has grown significantly faster than the other eight zones of the Lake Champlain Basin totaling 139% increase between 1950 and 1990, compared to 58% for the Lake Champlain Basin area as a whole. *Opportunities for Action, 1994*

Boat Use

- Highest total boat count on Lake Champlain was in Malletts Bay. *Lake Champlain Boat Study, 1993*
- In 1980 there were 1045 boats in Inner and Outer Malletts Bay and 1534 in 1992; a 47% increase. *Lake Champlain Boat Study, 1993*
Of non-moving boats there was an 11% increase in anchored boats, 101% increased in docked boats, and a 194% increase in moored boats.
- In 1989, 75% of boats were moored or docked at marinas or boat clubs. *Malletts Bay Capacity Study, 1989*

Water Quality

- Water circulation of Lake Champlain is most restricted in Malletts Bay due to causeways. Water drains to the west. *Opportunities for Action, 1994*

- Outer Mallets Bay is identified as a site of concern for high levels of arsenic and nickel, moderate phosphorous levels.
- Bayside Park was closed 12 times in 1988 due to high fecal coliform counts, but only 5 times during 1989 to 1993.
- Forty percent (40%) of lakeshore septic systems in Malletts Bay do not have current permits; built before 1970.

Opportunities for Action, 1994

Opportunities for Action, 1994

Opportunities for Action, 1994

Aquatic Nuisance

- Two locations in Outer Mallets Bay are being monitored for zebra mussels; Inner Malletts Bay has a Preliminary 1994 Zebra Mussel Watch Program site.

Opportunities for Action, 1994

Natural Resources

- Malletts Creek is targeted for protection under the Wetlands Acquisition Strategy.

Opportunities for Action, 1994

Malletts Bay Recreation Issues:

- Providing public access.
- Addressing congestion and conflicting uses.
- Safety, navigation, and enforcement.
- Tourism management.z

Opportunities for Action, 1994

Survey Implementation and Analysis: Summary

Recreational User Survey and Use Counts

(A full report of the User Survey and Use Counts is available for review under separate cover at the Colchester Town offices.)

Methodology

As input to recommendations for managing recreational use on Malletts Bay, *Resource Systems Groups, Inc.* designed and implemented a series of surveys and counts during the summer months of 1994. The survey and count program had the following parts:

- distribution of a self-administered questionnaire to users of Malletts Bay (User Surveys) on 6 intensive survey days, targeting boaters who access the Bay in each of 3 ways: via the Fish and Wildlife Access Area; via a marina; or via a shorefront property;
- aerial boat tallies twice per day (11:30 a.m. and 3:30 p.m.) on the 6 intensive survey days (Use Counts);
- boat tallies at the Vermont Fish and Wildlife Access Area on the 6 intensive survey days plus one additional day (Use Counts);
- collection of traffic count data from a pneumatic tube counter placed at the Fish and Wildlife Access Area egress for 6 weeks in the summer (Use Counts);
- collection of continuous traffic recording data for the entire summer from 2 sites in Colchester operated by the Vermont Agency of Transportation; and
- collection of weather data from the Burlington International Airport.

User Survey

The User Survey was conducted as a self-administered questionnaire, which targeted shorefront residents and users of Malletts Bay who access the water via the Vermont Fish and Wildlife Access Area or one of the marinas. Shorefront residents were comprised of those persons dwelling along the North Shore, or Braeloch area, and all the remaining shorefront residents along the southerly and easterly shores of Malletts Bay. The User Surveys were distributed in a variety of ways in order to facilitate the administration process and maximize response rates. All shorefront residents received their surveys at their homes by mail or hand-delivered, while survey stations were established at the Fish and Wildlife Access Area and at each marina. One assistant attended to the Fish and Wildlife Access Area survey station from 9:00 a.m. to 7:00 p.m., while another was assigned to "float" between marinas from 2:00 p.m. to 7:00 p.m.

The User Survey took approximately 3 to 5 minutes to complete. A total of 552 completed surveys for the 6 survey days were received. The survey format is provided in Appendix B. Further information is available in the full survey report.

Use Counts

The Use Counts data were gathered in three forms for cross-comparison: aerial counts of boats being actively used (as opposed to at berth) on Malletts Bay; counts of boats entering Malletts Bay at the Vermont Fish and Wildlife Access Area; and counts of vehicles exiting the Vermont Fish and Wildlife Access Area. Aerial flights were conducted for two separate time periods during each survey date, a morning count at 11:30 a.m. and an afternoon count at 3:30 p.m. The boat numbers were manually recorded as sighted while in the air.

Statistical Validity of Surveys and Counts

Since it is likely that the Recreation Management Plan will be based at least partly on the results of the survey analysis, it is critical to understand the proper uses and potential limitations of the data.

We received 552 completed User Survey questionnaires. For questions for which all of these surveys are relevant, this amount translates into a sampling margin of error of approximately ± 4.2 percentage points at the 95% confidence level. This means, in theory, 19 times out of 20 the results from the 552 surveys will differ by no more than ± 4.2 percentage points from what would be obtained were the full target population be surveyed. Two of the questions and issues can be analyzed under this realm of confidence:

- What is the ZIP CODE of your permanent residence?
- If another boat access were added to the Bay, in which Area would you want it to be located?

Of the 552 completed User Surveys, 384 were from people who actually boated on one of the 6 survey days. The reason for the discrepancy is that we received 168 completed surveys from shorefront residents who did not boat on the specific survey days. The 384 completed surveys from boaters translates into a margin of error of ± 5.0 percentage points at the 95% confidence level. The following survey questions can be analyzed under this realm of confidence.

- What type of boat did you use today?
- How many people were on the boat, including yourself?
- What was the primary activity of your boating trip?
- Please enter the approximate times that your boat trip began and ended today?
- In which Area did your boating trip begin?
- In chronological order, which Areas did you boat to today?
- In which Area did you spend the most time?
- In which Area did you have the best conditions for your primary activity?
- Which Area was the most crowded?
- Did you experience any conflicts or problems with other users of Malletts Bay?
- How crowded did you feel while boating on Malletts Bay today?
- Indicate the amount and location of expenditures made for this boating trip.
- Briefly describe the most and least appealing aspects of your boating trip today.

To help make inferences on days other than the 6 intensive collection days, a set of linear regression models were developed. These models enable the estimation of activity on Malletts Bay from other data, such as automobile traffic counts. The statistical validity of these models averages ± 10 percentage points.

Analysis of Survey Results

A Typical Summer Saturday

On a typical summer Saturday on Malletts Bay, we would anticipate a maximum number of boats active during any one hour to be around 170. On this typical day, a cumulative number of 400 boats would likely have used the Bay actively during some part of that day. Touring, sailing, and fishing would make up the majority of the boating activities while a wide diversity of other recreation types would be present, but not predominant. Fishing trips would start the earliest, followed by fairly consistent boating access from 9:00 a.m. to 2:00 p.m. Peak boating activity would tend to occur between 2:30 and 3:30 p.m.

On this typical summer Saturday, nearly every area of Malletts Bay would be utilized at some point of the day, however, some general patterns would emerge. Three-quarters of boaters would start their trip in the Inner Bay, with a third of all trips starting in the East Spaulding Bay area. The means of access would be split fairly evenly between the Fish and Wildlife Access Area, marinas, and shoreline properties. About one-half of the sailboats would stay in the Inner Bay, while the other half would pass through the Narrows and sail in the Outer Bay, while some would continue through the Cut to the Broad Lake. Motorboaters would disperse throughout both Inner and Outer Bays and many on to the Broad Lake. Many would congregate at Thayers Beach for swimming and picnicking on their boat. Thayers Beach is also a destination for many boaters coming from outside Malletts Bay. Fishing boats would also disperse throughout the Inner and Outer Bays, most often fishing close to the shoreline. If the winds are good, the northern area of the Outer Bay would be occupied by several windsurfers. Waterskiers would be in presence throughout the Bay, particularly in the Outer Bay. Other users would include personal watercrafters, canoers/kayakers, and scuba divers.

The highest incidence of conflicts between users would occur in the Narrows between Inner and Outer Bay, followed by the central area of the Inner Bay. The majority of the conflicts would be due to motorboats passing too closely to other boats and the shoreline and speeding, causing near misses, wakes, and bothersome noise. Personal watercraft would be the next area of conflict with complaints of noise and irresponsible behavior. Nearly two-thirds of recreationists would have "perceived crowding" to some degree, in other words, felt there were simply too many boats for their liking. The following describes the existing use patterns in more detail.

Typical Mix of Activities on Malletts Bay

Touring, sailing, and fishing make up the majority of boating on Malletts Bay. However, the Bay accommodates a diversity of other recreation activities including water skiing, nature enjoyment, swimming, paddling, personal watercrafting, scuba-diving, and windsurfing. Miscellaneous other activities include research and rowing. See Tables 2 and 3 on the following page for a breakdown mix of uses.

Comparing the survey results with boat counts of 1980 and 1992, as represented in the Lake Champlain Boat Study, there does not appear to be an identifiable trend in the changes of mixes of use. In 1980 the percent of motorboating and sailing were fairly equal with a relatively small percent of fishing. In 1992 motorboating had risen significantly to nearly three-quarters of total users and sailing dropped to 17%. According to the survey results of 1994, the percent of motorboating dropped from the 1992 level, but remained above the 1980 levels, sailing rose above the 1992 level, but fell below 1980 levels, and fishing levels were higher than both 1980 and 1992. See Table 2 for the comparative mix of uses between 1980, 1992 and 1994, considering just motorboating, sailing, and fishing. The discrepancy in mix of uses between 1992 and 1994 could be due to the difficulty in distinguishing motorboats that are being used for touring versus fishing from aerial photographs, as was used in 1992, or weather on that particular day.

Table 2: Comparing Mix of Use from 1980, 1992, and 1994.

	<u>1980 %</u>	<u>1992 %</u>	<u>1994 %</u>
Motorboating	40.6	74.6	55.3
Sailing	46.9	17.0	24.4
Fishing	<u>12.5</u>	<u>8.4</u>	<u>20.3</u>
Total	100	100	100

Typical Mix of Boats in Use on Malletts Bay

Motorboats are the leading category of boat used in the boating activities, accounting for two-thirds of the total, with sailboats making up nearly a quarter. Canoes, kayaks, windsurfers, personal watercraft, and others make up the remaining 10%. Marina users are the most likely to use a sailboat, and shorefront residents are the most likely to use a non-motorized craft.

Over half of all boats are 21 feet in length or less, while 39% are 22'-32' in length, leaving 8% in the greater than 33' size class. Again, compared with the previous boat counts there is not an obvious trend in changes of boat sizes. See Table 3: Comparing Boat Sizes from 1980, 1992, and 1994.

Table 3: Comparing Boat Sizes from 1980, 1992, and 1994.

	<u>1980 %</u>	<u>1992 %</u>	<u>1994 %</u>
0' - 21'	65	47	53
22' -32'	27	49	39
> 32'	8	4	8
Total	100	100	100

Typical Number of Boats in Use on Malletts Bay

The data from the use counts, surveys, boat access counts, and highway traffic counts were used to determine average peak hour usage of Malletts Bay. The data indicates that an average peak hour usage on weekends is two to three times greater than that of weekdays. The data also shows that the busiest boating hour of any given week is likely to be 2:30 p.m. to 3:30 p.m. on a Saturday; during this hour there are likely to be approximately 170 boats under active use on the Bay (as opposed to moored or docked.)

The data also indicate that, on average, about one-third of peak hour boat usage is from each means of access: Fish and Wildlife Access Area, marina, and shorefront property. A higher percentage of shorefront resident boat trips start during hours that, accounting for an average trip duration of around three and one half hours, would contribute to the peak usage (47% for shorefront residents, 43% for marinas, and 52% for Fish and Wildlife Access Area). The effect of this is offset by the fact that boaters starting from either marinas or from the Fish and Wildlife Access Area tend to spend a longer period of time out on the water (5.4 and 4.7 hours, respectively). On a typical Saturday on Malletts Bay, we would anticipate a maximum number of boats active during any one hour to be around 170. On this typical day, a cumulative number of 400 boats would likely have actively used the Bay during some part of that day.

From the 1994 boat counts, the average number of boats in use was 98 in the morning count and 139 in the afternoon count. The average split in the number of boats of afternoon use was about 65 in the Inner Bay and 75 in the Outer Bay. See Table 4 for the Boat Tallies.

Table 4: 1994 A.M. and P.M. Boat Tallies, with P.M. Tallies for Inner and Outer Malletts Bay
(Information from *Bulmer, Boat Study, 1994*)

		Total A.M. <u>Boat Count</u>	Total P.M. <u>Boat Count</u>	Inner Bay P.M. <u>Boat Count</u>	Outer Bay P.M. <u>Boat Count</u>
Saturday	7/23	76	109	54	55
Friday	8/19	90	149	61	88
Saturday	8/19	100	152	41	111
Saturday	9/3	94	133	60	73
Sunday	9/4	132	154	108	46
Average		98.4	139.4	64.8	74.6

The average boat counts of 1994 can be compared to the 1980 and 1992 boat counts (See Table 5: Comparison of Counts of Boats in Use...). According to the comparison, there was a slight decrease in the boats counted in use on Malletts Bay in 1980 compared to 1992. The slight decrease could easily be a weather factor of the time of the flights as boat usage tends to increase steadily through the day until reaching the average peak hour 2:30 p.m. to 3:30 p.m. The two counts which are most comparable are the Saturday, July 25, 1992 at 10:30 a.m. and the Saturday, July 23, 1994 morning count showing an increase from 59 to 76 boats in use, or an increase of 29%.

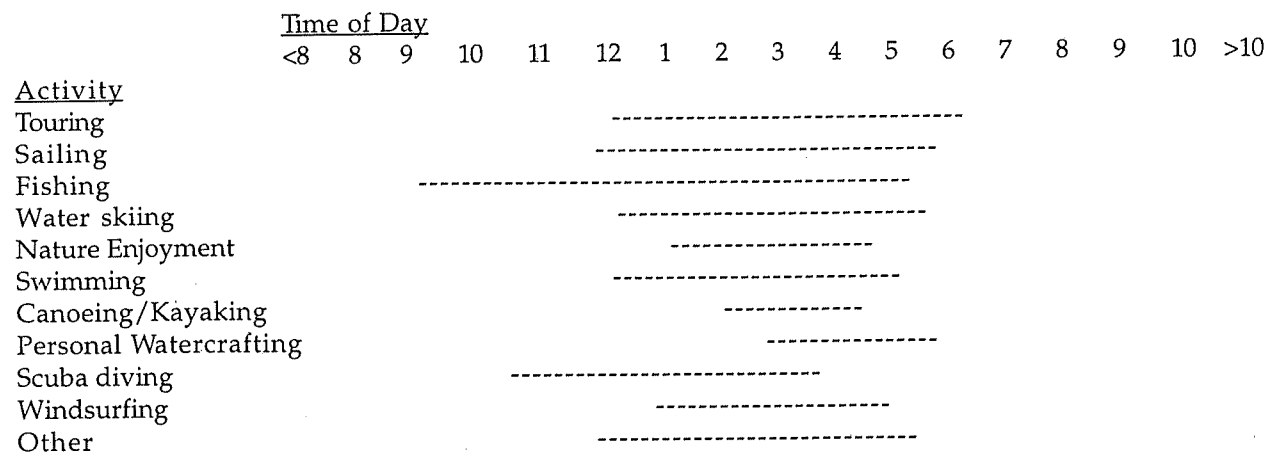
Table 5: Comparison of Counts of Boats in Use on Malletts Bay Between 1980, 1992 and 1994.

July 1980 <u>mid-day</u>	July 25, 1992 <u>10: a.m.</u>	Average 1994 <u>a.m.</u>	Average 1994 <u>p.m.</u>	July 23, 1994 <u>a.m.</u>	<u>p.m.</u>
64	59	98.4	139.4	76	109

Typical Time and Duration of Boat Trips

Based on the survey results, Figure 4 shows the average start and end times of boating activities. On average, fishing trips start at 9:30 a.m. and last nearly 6 hours ending at 3:15 p.m. Approximately 60% of early morning boaters (<8:00 a.m. access time) are anglers. After a lull in the 8:00 - 9:00 a.m. hours, there is a strong and consistent amount of boat ingress per hour from 9:00 a.m. until 2:00 p.m., with the 11:00-12:00 noon slot being the most active accessing time. During the 9:00 a.m. to 2:00 p.m. time period 61% of all boat trips begin. The average time for all activity types overlap during the time period of 1:00 - 2:30 p.m.

Figure 4: Average Start and End Time of Boating Trips by Activity



The average duration of boat trips is between 3.5 and 5.5 hours. Anglers tend to spend the longest average time out on the water at 5.8 hours, followed closely by sailors and cruisers at 4.3 hours each, while those people personal watercrafting or canoeing/kayaking, spend an average 2 to 3 hours out on the water.

Table 6: Average Duration of Boat Trips by Activity

Activity	Average Duration of Boat Trips (Hours)
Fishing	5.8
Sailing	4.3
Touring/Cruising	4.3
Nature Enjoyment	3.8
Personal Watercrafting	3.1
Other	3.0
Canoeing/Kayaking	2.1

Existing Recreation Use Areas and Mixes

As shown on the map of Existing Summer Recreational Use Areas (Figure 5) all areas of Malletts Bay are utilized. The central part of the Outer Bay is the area where 24% of respondents spent the most time; accommodating about a quarter of those who were touring, sailing, fishing, water skiing, and scuba diving, and approximately a third of the personal watercrafters. See Figure 7. The central part of the Inner Bay was reported by 16% of respondents as the area where they spent the most time. This area accommodated nearly a third of the sailing boats and one-fifth of those fishing and sightseeing or enjoying nature. The Inner Bay is also the area for the weekly sailing races every Thursday night and much of the training of students of the International Sailing School. The north shore of the Inner Bay is popular for a diversity of uses identified by 12% of respondents as the area where most time was spent. In the Outer Bay, Thayers Beach is a common destination for motorboats, both from within Malletts Bay and from the Broad Lake, who will anchor in the shallow waters, swim and picnic on their boats. Thayers Beach area is also popular for water skiing.

Nearly 14% of respondents spent most of their time outside of Malletts Bay in the Broad Lake including one seventh of those sailing and touring. The Colchester shoals and the shipwreck "Phoenix" are popular scuba diving areas in the area outside Malletts Bay. Many motorboats will cruise from Malletts Bay to the New York shore of Lake Champlain as a destination, while those sailing will frequently pass through the Cut and around Stave Island and back into Malletts Bay as a day trip.

Figure 6, Existing Winter Recreational Use Areas, identifies the winter use patterns identified by key informants. The southern shore of the Outer Bay is a popular area for ice fishing, as are parts of the Inner Bay. Winter access to the bay is very limited. At this point, most winter recreationists gain access via private property in Niquette Bay and off Porters Point. This is entirely by the generosity of the landowners. The public boat access does allow winter access, however the general pattern of ice ridges in the Narrows often renders travel to the Outer Bay dangerous or impossible.

Existing Access: Beginning Location of Trips

Nearly one-third of all respondents started their trips from the East Spaulding Bay area, which includes the public boat access and Champlain Marina. Anglers are the most prevalent users of the Fish and Wildlife Access Area, with nearly half of all reported fishing trips starting in East Spaulding Bay. Other groups starting in East Spaulding Bay included nearly a third of touring respondents and those boaters who claimed swimming as their primary activity. Half of the personal watercraft, sailboats, and scuba diver respondents, and one-quarter of paddlers, started their trips in East Spaulding Bay.

The area east of Coates Island was the second highest reported beginning location of trips accounting for 18% of total trips. Over one-third of recorded sailing trips started in this area, which includes the highest density of moorings and three marinas. All other areas provided access for a diversity of users, with Thayers Beach accommodating 12%, the north shore of the Inner Bay at 11%, and Bayside area at 10%. See Figure 8.

Existing Conflicts

Approximately 20% of survey respondents reported having a conflict or a problem with other users of Malletts Bay. The most prevalent conflict reported was in regard to boating etiquette: motorboats passing too closely to other boats, swimmers, and shoreline, speeding, and the resulting wakes and noise. Problems with personal watercraft were reported 24 times out of a total of 75 responses, throughout the Inner Bay and at Thayers Beach.

Figure 9 identifies the amount and type of conflict by area. The greatest number of conflicts (34%) were reported to occur in the Narrows between the Inner and Outer Bays with concerns of motorboats passing too closely, speeds, large wakes, and personal watercraft "harassing" canoers/kayakers.

The central area of Inner Bay accounted for 17% of the conflicts, with reports of motorboats speeding and lack of etiquette, and several complaints of personal watercraft. There were a few complaints about waterskiers passing too closely to fishing boats and swimmers, and a sailboat passing too closely to an anchored fishing boat. Three complaints were recorded about poorly marked moorings near Mill Point. One sailor complained of fishing boats anchored in the Cut. This was a concern voiced by other sailors in the key informant interviews. Several fishermen complained of crowding at the fishing access.

If the amount of use was allowed to increase without the implementation of management strategies we would expect a compounding of existing conflicts particularly for the high use areas: East Spaulding Bay, East of Coates Island, the central area of the Inner Bay, and the Narrows.

Perceived Crowding

Survey respondents were also asked to rate their perceptions of crowding using a crowding scale fashioned after a model suggested by Zwick in the Vermont Lakes and Ponds Recreation Management Study. This study suggests that two of the nine scale points indicate an uncrowded situation while the remaining 7 indicate some degree of crowding. Using this as a benchmark, the Malletts Bay survey data indicate that 62% of users perceived crowding on Malletts Bay. Seventeen percent (17%) experienced a severe degree of crowding, while 38% of users experienced no crowding. See Figure 10. According to Zwick, et. al., (1990).

“When over 65% of the visitors feel crowded, there is a definite problem. At this stage, managers and interests groups may wish to take action to reduce use levels without waiting for the time and funds necessary for a complete carrying capacity study. If visitor impacts are an important part of the experience, it makes sense to freeze use levels immediately when crowding reaches 65% of greater.”

Respondents were also asked to identify the area where they perceived crowding. (See Figure 11 for a map of the areas where respondents perceived crowding). The central area of the Inner Bay, East Spaulding Bay, and the Narrows each were reported by nearly a quarter of the respondents as crowded. A relatively high percentage of respondents (11%) perceived crowding along Thayers Beach.

This response of 62% of respondents reporting perceived crowding signifies a definite problem. Management strategies to either reduce or redistribute use should be developed, implemented, and monitored before any proposals for facilities that would increase use be considered.

Existing Summer Recreational Use Areas based on key informant interviews

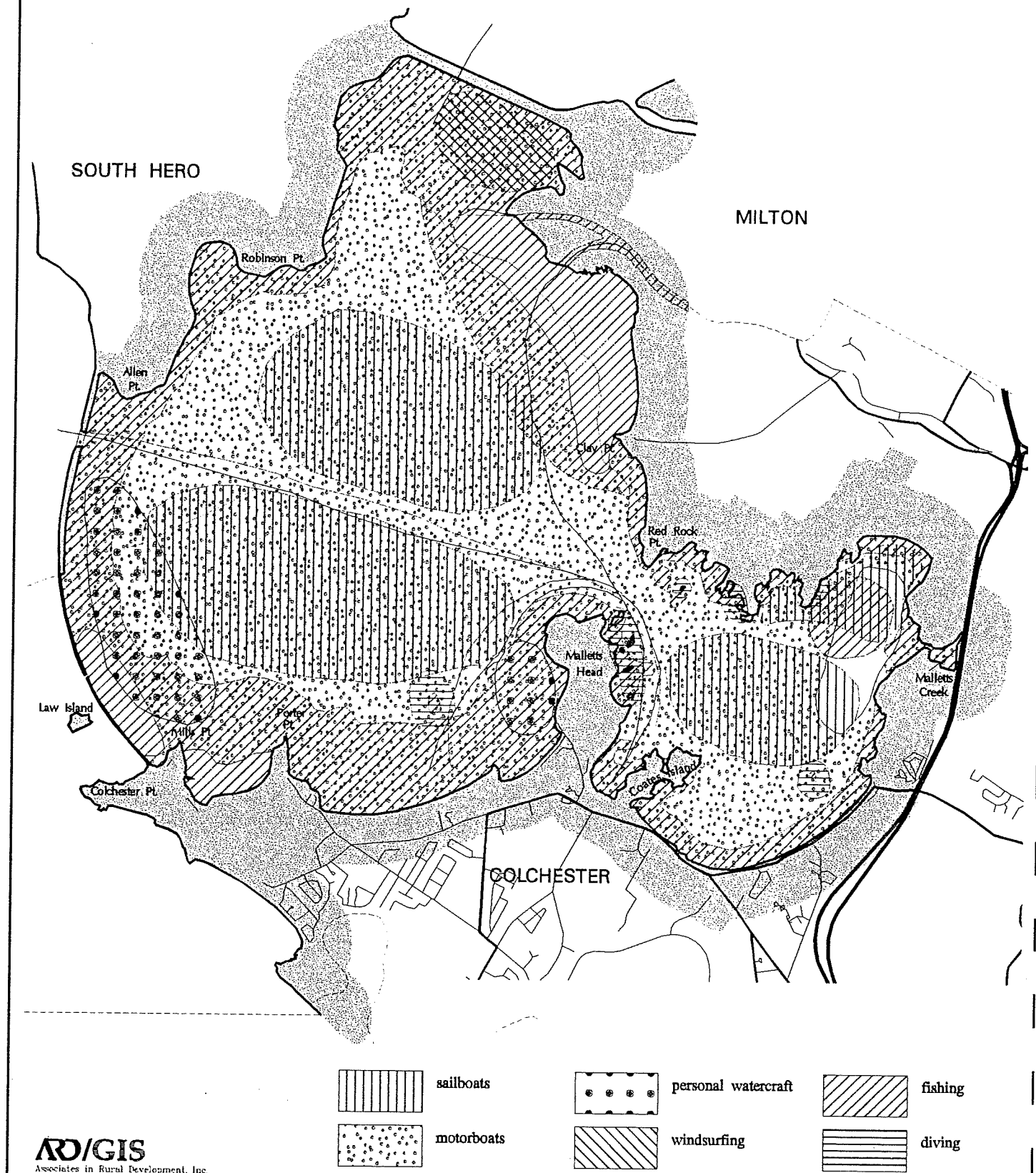


Figure 5

Existing Winter Recreational Use Areas
based on key informant interviews

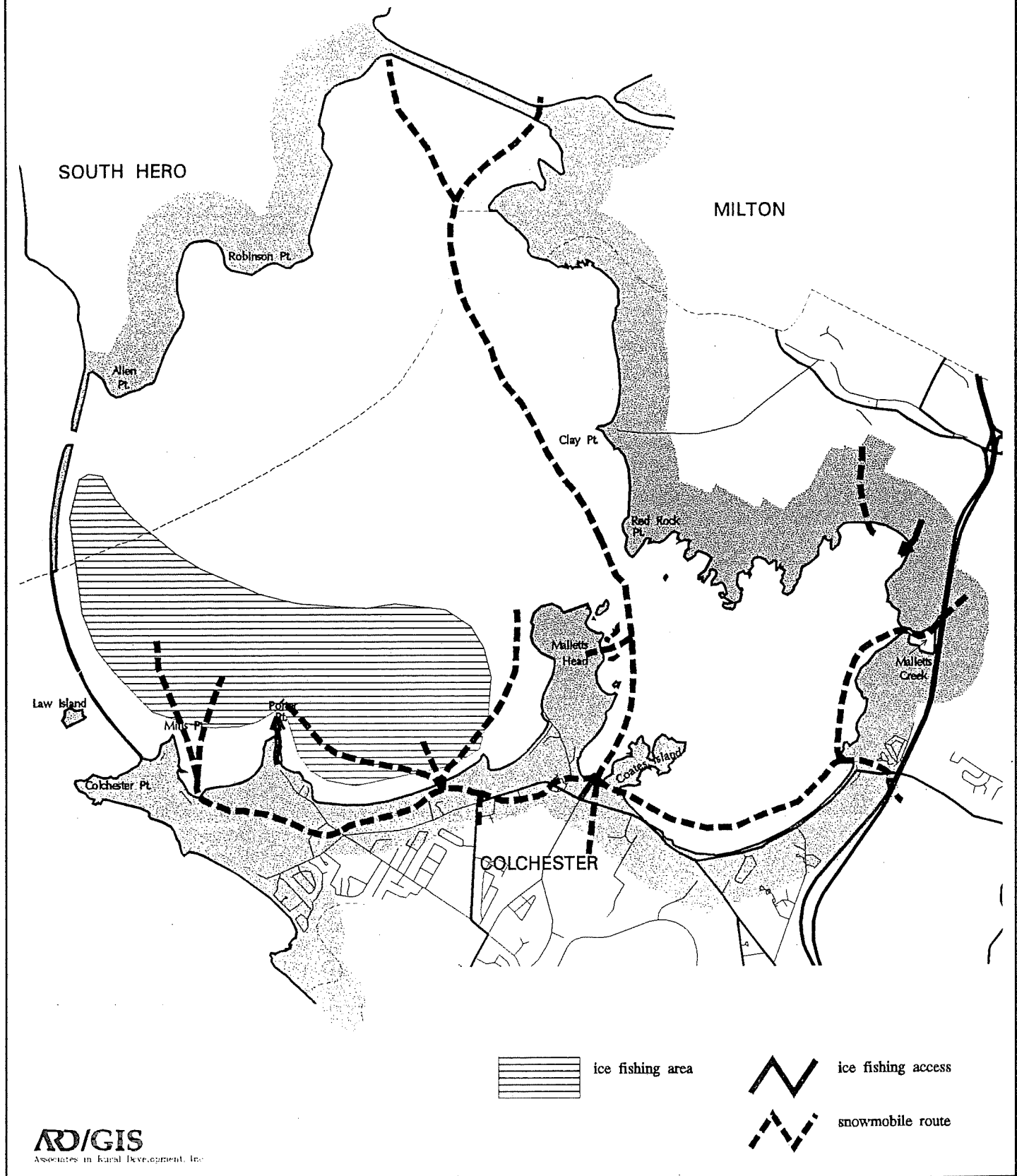
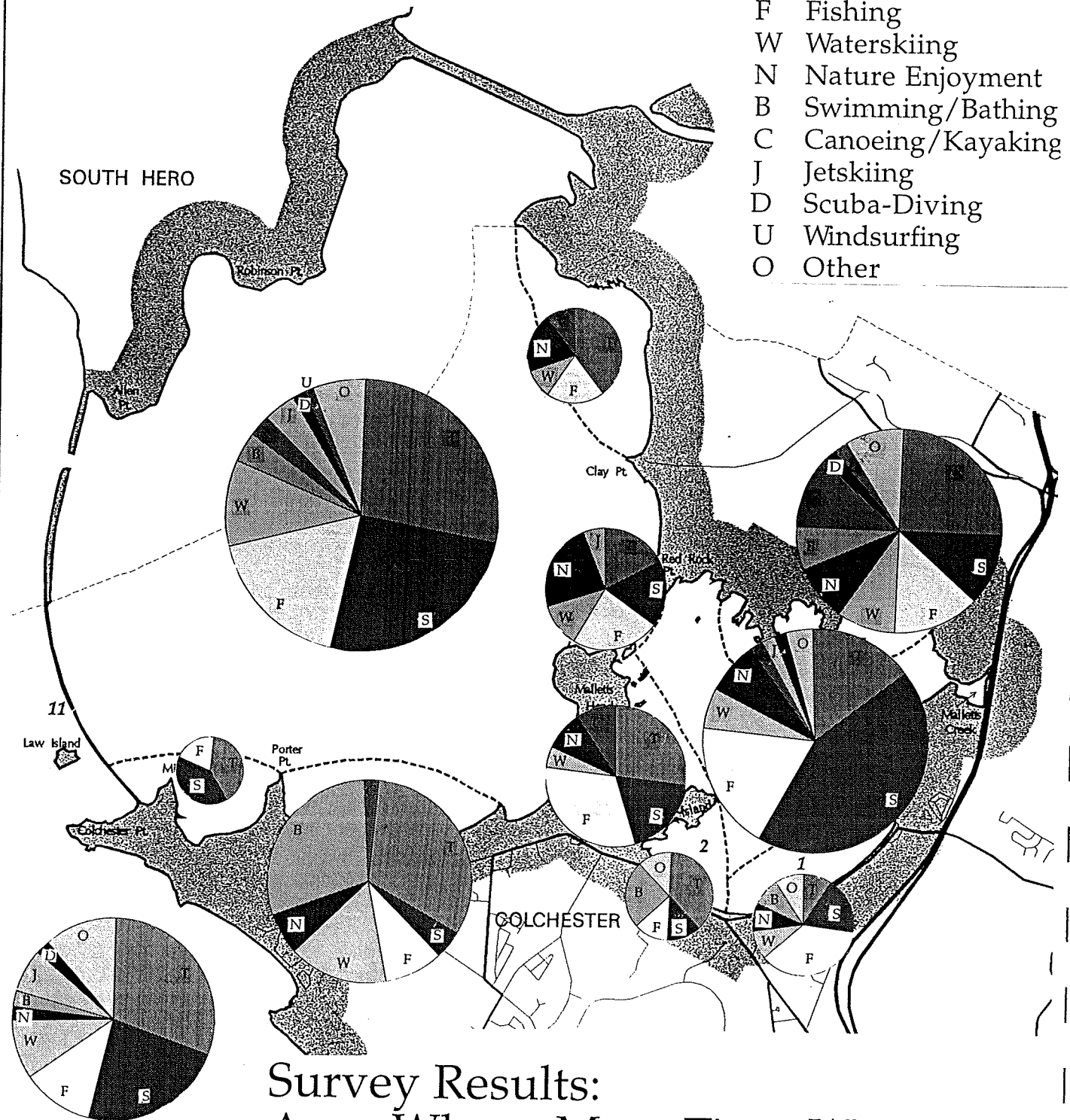


Figure 6

Key

- T Touring
- S Sailing
- F Fishing
- W Waterskiing
- N Nature Enjoyment
- B Swimming/Bathing
- C Canoeing/Kayaking
- J Jetskiing
- D Scuba-Diving
- U Windsurfing
- O Other



Outside Malletts Bay
RO/GIS
 Associates in Rural Development, Inc

Survey Results: Area Where Most Time Was Spent Malletts Bay Recreation Management Plan

Figure 7

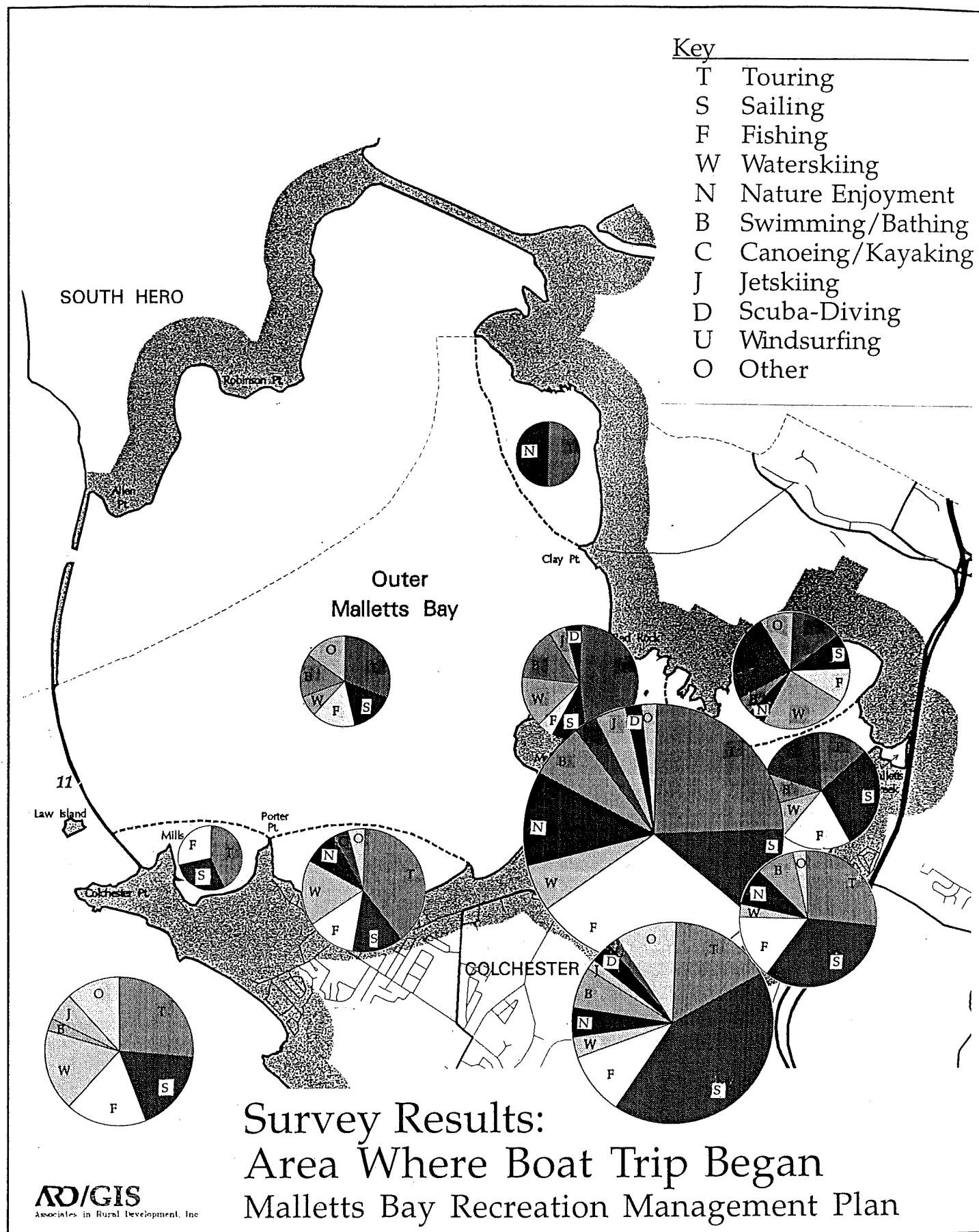
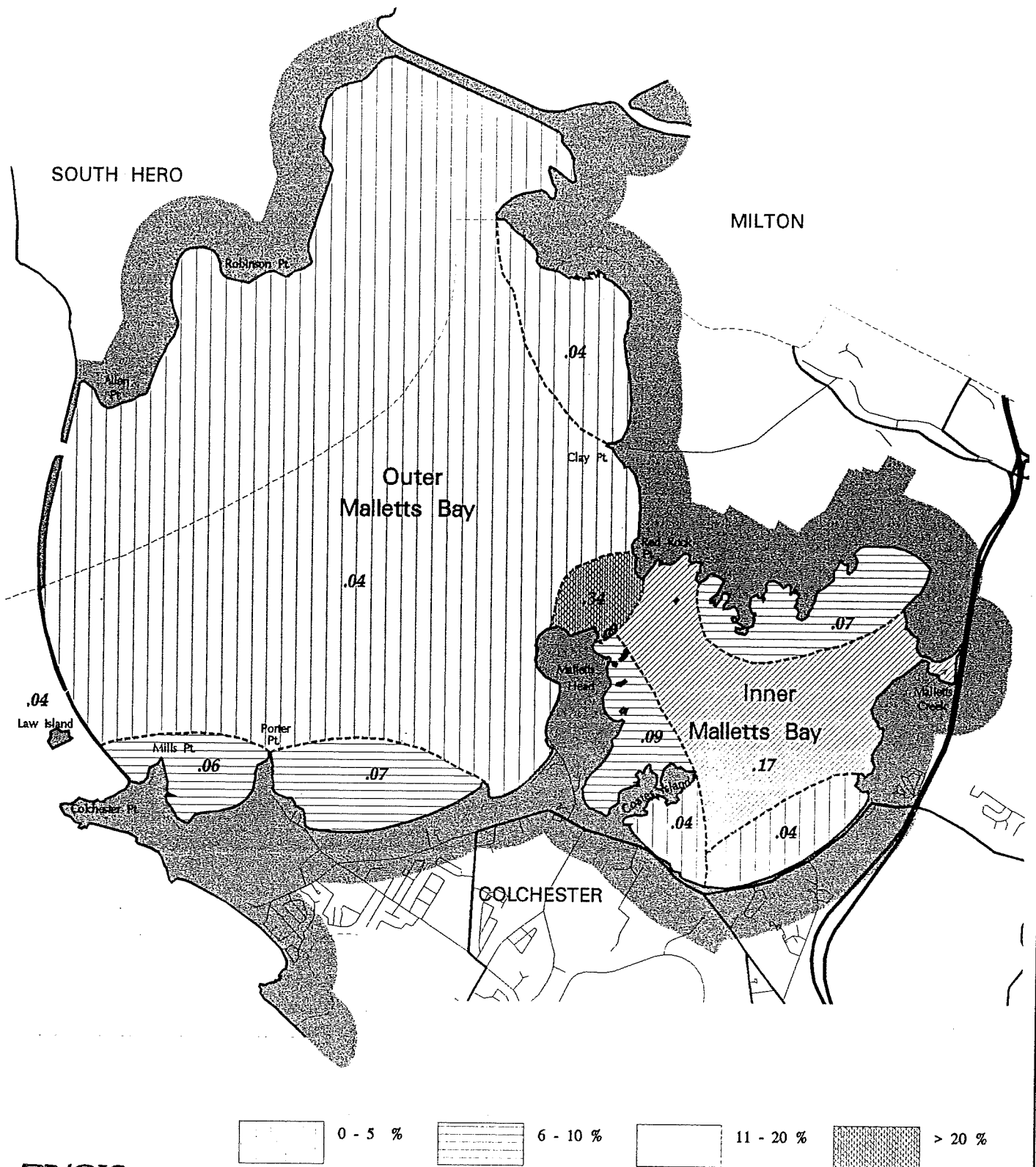


Figure 8

Recreational Conflicts by Area as reported in User Surveys



AD/GIS
Associates in Rural Development, Inc.

Figure 9

Figure 10 *Perceptions of Crowding, Expressed as a Percentage of All Survey Respondents (n=359)*

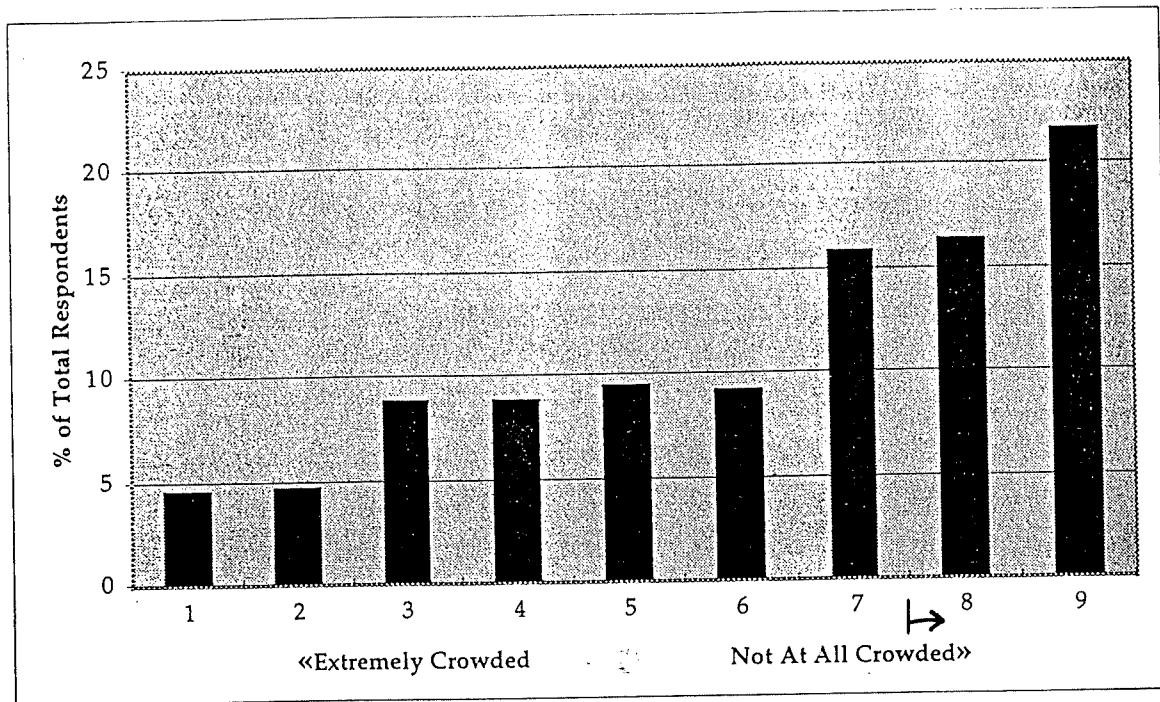
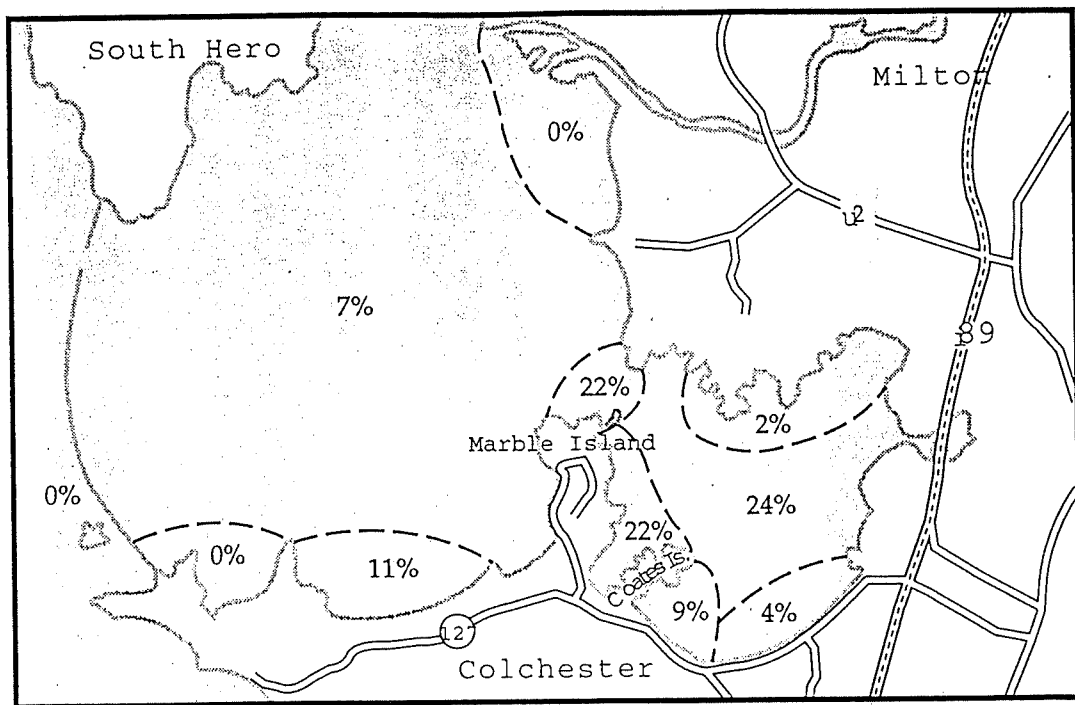


Figure 11 *Areas on Malletts Bay Where Crowding is Perceived by Boaters*



Insights for Recreation Management Planning from the Survey and Use Count Results

A key question which led the design of the survey program is: how many boats can utilize Malletts Bay? This is a key policy issue that requires the judgment of many stakeholders. This survey analysis can inform this decision making process.

A central piece of information relates to the perceptions of crowding as reported by boaters. The relationship between peak usage and perceptions of crowding can yield an estimate of what percentage of the boating population would perceive it to be crowded at what different levels of use.

For the 6 intensive survey days, we have correlated perception of crowding with estimated boating activity on Malletts Bay for those days. Figure 12 correlates the percentage of survey respondents who perceived crowded conditions (Rank<8) with estimates of peak boat usage on Malletts Bay for that day. The data upon which Figure 12 is based are not ample enough to draw solid conclusions from, however, the trends are reasonable, indicating higher perceptions of crowding with heavier peak hour boat use. The August 20 date is a statistical outlier with high boat usage and relatively low perceptions of crowding. There are apparently many more factors that go into a person's perceptions of crowding than just the number of boats.

Figure 13 takes the data used for Figure 12 and adds to them information on high temperature and the percent of possible sunshine for the days on which crowding perceptions were gathered. A regression equation was estimated to mathematically relate the perceptions of crowding to peak hour boat usage, averaging for the whole summer. For the equation, the percent of boaters perceiving crowded conditions (answering 1-7 on the crowding scale provided in the survey) is the dependent variable. There are 3 independent variables: peak hour boat usage of Malletts Bay; daily high temperature; and the percent of possible sunshine. The regression statistics are as follows:

SUMMARY OUTPUT

<u>Regression Statistics</u>			
Multiple R	0.792424257		
R Square	0.627936203		
Adjusted R Square	-0.488255188		
Standard Error	16.07815554		
Observations	5		

	<u>Coefficients</u>	<u>Standard Error</u>	<u>t Stat</u>
Intercept	-113.7164314	356.317663	-0.319143403
% Possible Sunshine	1.174166379	2.180140116	0.538573815
High Temp	0.824644949	3.063432235	0.269189878
Est. Peak Boat Usage	0.188350451	0.314213093	0.599435401

For the 1994 summer on Malletts Bay, the average % of Possible Sunshine was 61% and the average high temperature was 79 degrees. Holding these 2 factors constant and varying the number of boats using Malletts Bay during a peak usage hour yields the relationship shown in Figure 13.

The graph in Figure 13 is an estimate, and the following caveats are necessary:

- The data set is extremely scant with only 5 days of observations upon which to base the mathematical relationship; clearly more days of data would be necessary to build confidence in the estimate.

- It is likely that other relationships are in effect on Malletts Bay that cause a non-linearity in the relationship between peak hour usage and perceived crowding. This means that there could be some inter-relating factors that would lead to a higher perception of crowding with lower peak usage, or vice versa. An example of this would be caused by the exceeding of noise or wake thresholds at some critical density of boats on Malletts Bay; every additional boat on Malletts Bay past this threshold would have a disproportionate impact on crowding. Since there are many important factors that contribute to perceptions of crowding that are not represented in the regression equation, such non-linearities are not represented.

There are long-term consequences of perceived crowding. First, a boater on Malletts Bay who perceives crowding may decide not to boat on Malletts Bay again because of that one experience, particularly if that experience is their first boating trip on Malletts Bay. This is referred to as displacement. Thus, there may be in effect a process that selects boaters with progressively higher tolerances of crowding. Users less tolerant of crowding are displaced to other areas to seek their recreational experience there. As a result of this, the mix of users of Malletts Bay may shift over time to those uses most compatible with crowded conditions.

In summary, correlating peak boat usage and perceived crowding can be a means to determine a desirable limit to the number of boats utilizing Malletts Bay, however, the current level of data is not adequate for establishing limits. We would recommend continued monitoring and building regression models to test the correlation of peak boat usage and perceived crowding. A reasonable target would be a strong correlation coefficient of $r \geq .8$ and at least a doubling of the number of observations from 5 to 10. Over the long term, over 100 observations should be targeted. Our current correlation of .79 is approaching a strong correlation between variables in our model.

Figure 12 *Correlation of Perceptions of Crowding with Estimated Peak Boat Usage on Malletts Bay (n=65)*

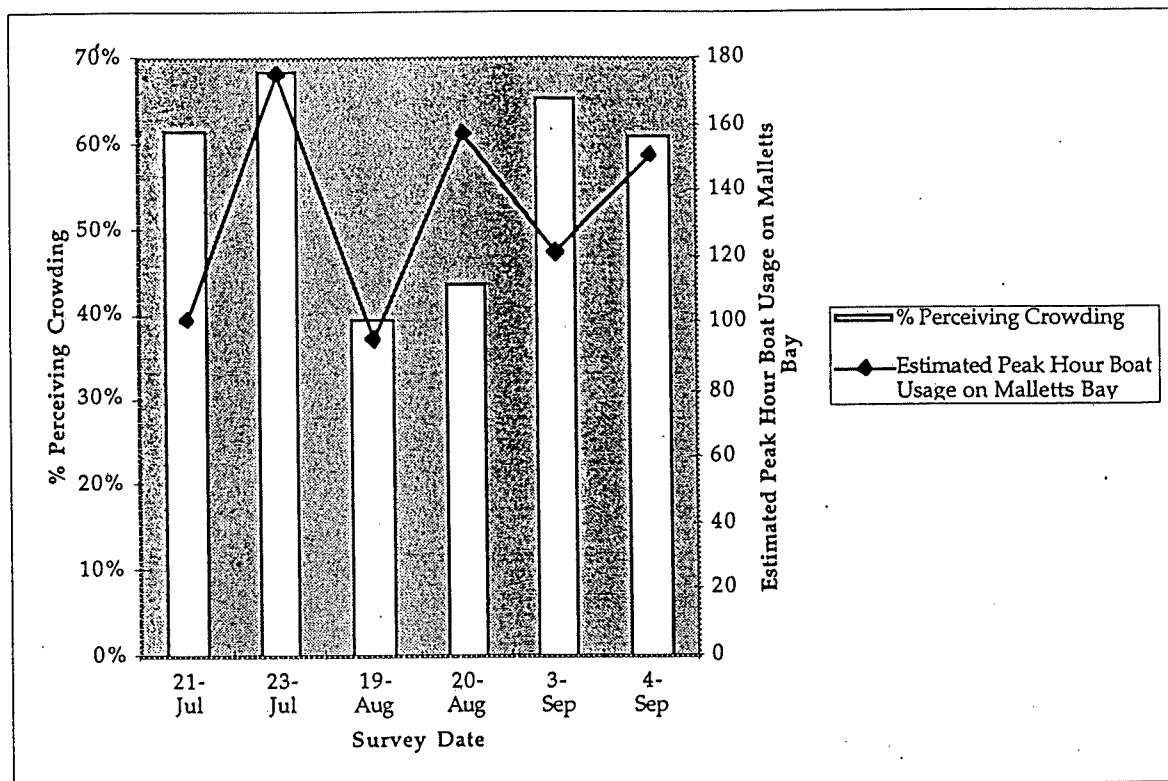
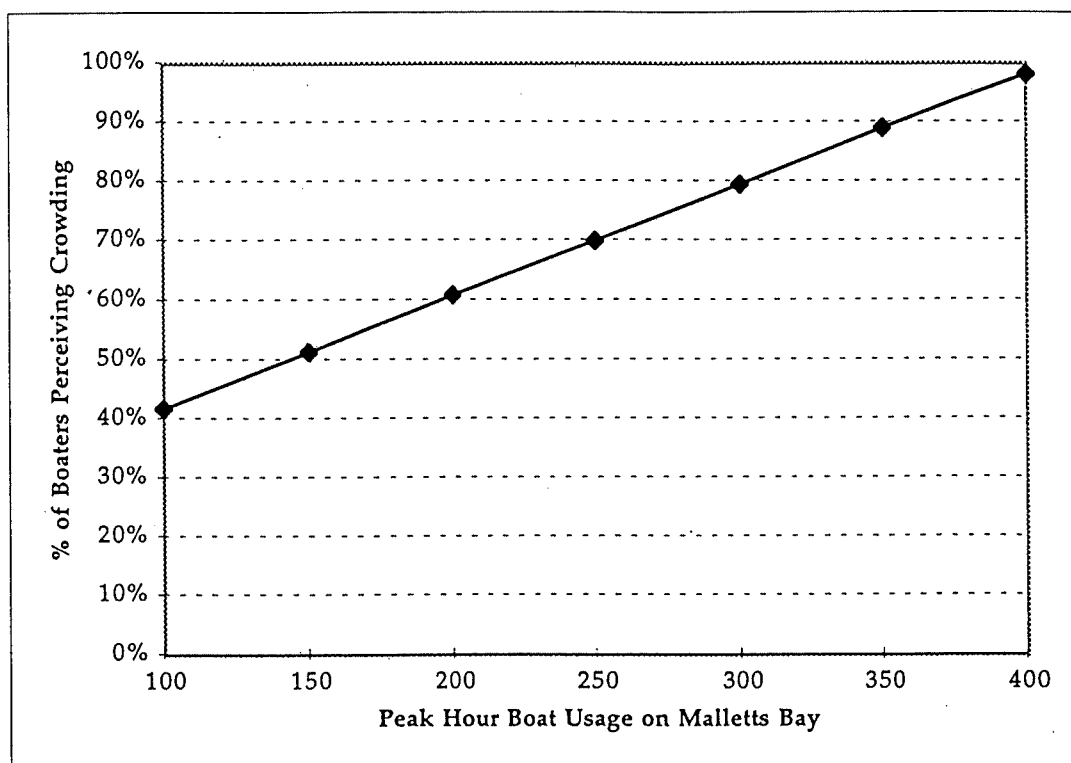


Figure 13 *Estimated Boaters Perceiving Crowded Conditions as a Function of Daily Peak Boat Usage*



General Attitude Survey

Purpose and Administration

A General Attitude Survey was the third component of the survey data collection effort for the Malletts Bay Recreation Management Plan. The target population of the General Attitude Survey were people who are not immediately associated with Malletts Bay as marina-users or shorefront residents. The purpose of the General Attitude Survey was to assess this population's predilection to use or not use Malletts Bay for recreation, and to understand their reasons.

The General Attitude Survey was conducted as a telephone survey which targeted residents of the eight Chittenden County municipalities within ten miles of Malletts Bay (Colchester, Burlington, Milton, Westford, Essex, Winooski, South Burlington, and Williston). The survey sample was drawn in proportion to the town populations, and town-specific telephone numbers were randomly generated by a computer.

The General Attitude Survey was conducted on the evening of Thursday, November 10 from the hours of 5:00 to 9:00 p.m. One hundred and five households in the target area were contacted. Telephone respondents were assured of the fact that their numbers were acquired randomly and that all of their responses would remain confidential. Eighty-three surveys were completed during the course of the evening, a 79% response rate. The sampling rate provides a margin of error of 10.75% at the 95% confidence level. The survey contained seven questions and took approximately 3 minutes to conduct. The survey format is provided in Appendix E.

General Attitude Survey Results

This section describes the frequency with which people responded to the choices for each question. General comments and attitudes voiced by respondents will be described thereafter.

Question 1: What town do you live in?

Table 7. Number of Persons Surveyed for the General Attitude Survey by Municipality.

<u>Municipality</u>	<u>1990 Population</u>	<u>% Total Population</u>	<u>Survey Respondents</u>	<u>% of Total Respondents</u>
Burlington	39,127	37%	33	40%
Colchester	14,731	14%	19	23%
Essex	16,498	16%	7	8%
Milton	8,404	8%	7	8%
So. Burlington	12,809	12%	11	13%
Westford	1,740	2%	0	0%
Williston	4,887	5%	3	4%
Winooski	<u>6,649</u>	<u>6%</u>	<u>3</u>	<u>4%</u>
Total	104,845	100%	83	100%

Question 2: Have you heard of Malletts Bay on Lake Champlain?

When asked whether or not they had ever heard of Malletts Bay before, the overwhelming majority of people responded that they had. 92% of the people surveyed, 76 out of 83, had heard of Malletts Bay before.

Question 3: Have you ever used Malletts Bay for recreation?

Of those surveyed, 59% of respondents (n=49) had used Malletts Bay for recreation.

Question 3a: Which of the following best describes why you have not used Malletts Bay for recreation?

This question was asked of the 25 people who did not choose to go to Malletts Bay. Of the reasons given, 2 people said that Malletts Bay was not convenient, or that the Vermont Fish and Wildlife Access Area was poor, 9 people responded that they preferred to recreate somewhere else; and 13 people mentioned other reasons. Of those who responded with other reasons, 5 people said that they were not aware of what opportunities or facilities were available at Malletts Bay. The other 8 respondents did not go to Malletts Bay for various personal reasons.

Question 4: What is the primary activity you engage in when you go to Malletts Bay?

When asked what activity they primarily engage in when they visit Malletts Bay, many respondents answered that they sometimes visit for multiple reasons. Someone who visits Malletts Bay for the day to sail may also swim, for example. Figure 14 depicts only the primary activity mentioned.

Additionally, people go to Malletts Bay to engage in recreational activities that are not water-oriented. Golf, camping, tennis, cycling, running, picnicking, and softball were other activities mentioned by respondents.

Question 5: How well suited is Malletts Bay for your primary activity?

Most people felt that Malletts Bay was well suited for their primary recreational activity. Thirty-one people (61%) found Malletts Bay well suited, thirteen people found it to be average, and six found it to be not well suited for their activity.

Question 6a: What is the main reason Malletts Bay is well-suited to your primary activity?

Most people cited convenience/good access as the primary reason why Malletts Bay was well suited to their primary activity. Twenty-one people (67%) responded that this was their primary reason. Two people chose scenic beauty/clean water as their reason, while one person cited the area's good services.

Question 6b: Why is Malletts Bay not well suited to your primary recreational activity?

The responses to this question were much more varied than were those by people who found Malletts Bay well-suited to their activities. People who did not find Malletts Bay well suited to their primary recreational activity cited the following reasons, as depicted in Figure 15: inconvenience/poor access, too crowded, too polluted, recreate elsewhere, or others.

Question 7: Do you have any recommendations for improving Malletts Bay for recreation?

Answers to this question were varied as well. People recommended improving the water quality in the Bay, to improving the general look and feel of the area by improving roads and adding more public spaces. Increasing the amount of public land along the waterfront was a common suggestion. Ideas to

that end ranged from: eliminating camps along the water, making the waterfront more like that in Burlington, adding a park near the Vermont Fish and Wildlife Access Area, adding a bike path that would connect with the one in Burlington, and adding/improving Vermont Fish and Wildlife Access Area points for boats.

Impression and Conclusions of General Attitude Survey

Based upon the responses to the preceding questions and the general comments that people have made, people generally know about and like to visit Malletts Bay. However, the general attitude survey did reveal that people felt that there was room for improvement. One important finding of the survey revealed that people would frequent the area more often if they had more knowledge of activities and amenities offered them. The perception that use of the Bay and its facilities is largely private, or limited to residential owners, was common. Recommendations for improving and increasing the amount of Vermont Fish and Wildlife Access area space in the Malletts Bay area only supports this idea. Additionally, people enjoy visiting the area for a variety of reasons, of which convenience and scenic beauty are a part. Furthermore, people who choose to recreate at Malletts Bay often engage in more than one activity, many of which are non-water related.

Figure 14 *Frequency of Responses to General Attitude Survey to Type of Recreational Activity Pursued on Malletts Bay*

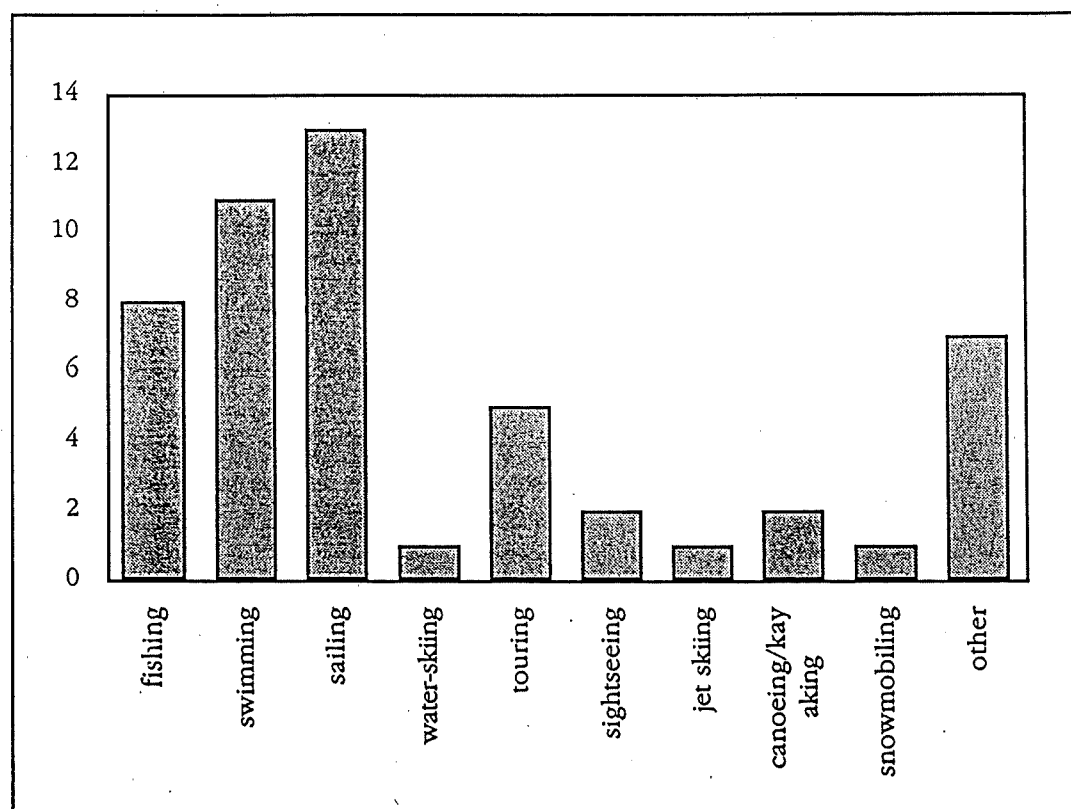
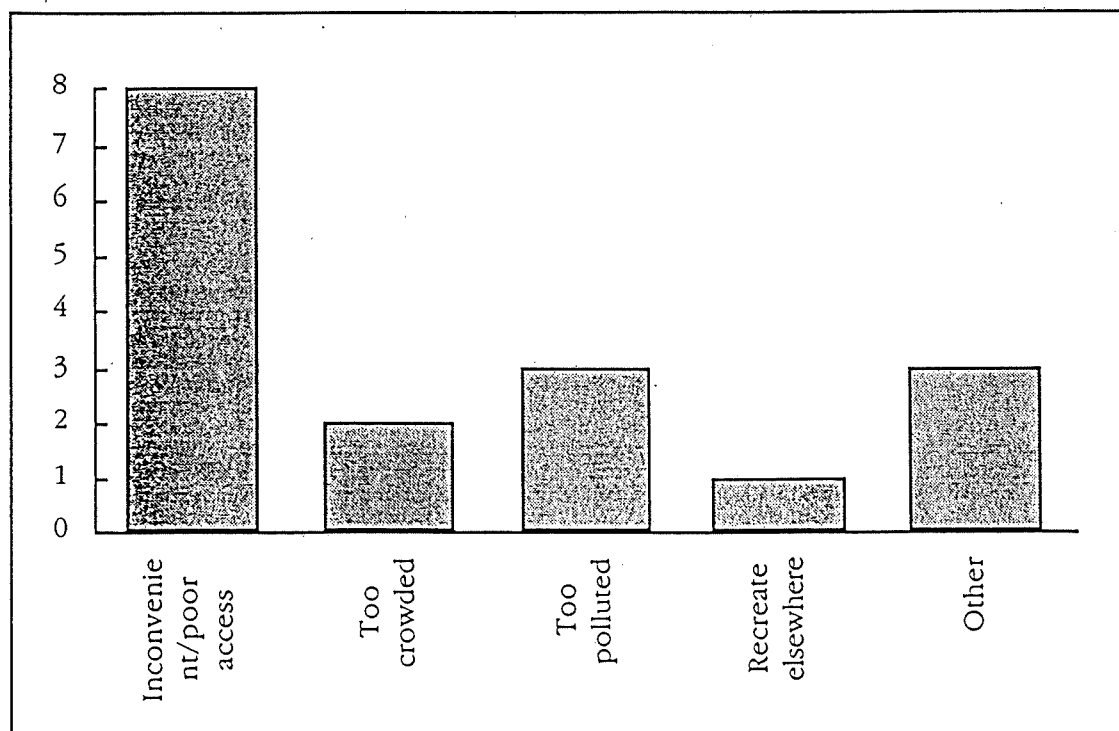


Figure 15 *Reasons Given for Why Malletts Bay is Not Well Suited to a Primary Recreational Activity (by Number of Respondents)*



Key Informant Interviews

Eighteen Key Informants, particularly knowledgeable community members, recreationists, and/or business owners, were interviewed for their insights on the issues which need to be addressed in Malletts Bay and their suggestions of what should be done about them. The following is a summary of each interview:

Interview: Tom Soules
Malletts Bay Advisory Commission
30 Aug 94

History of Malletts Bay Advisory Commission

- Malletts Bay Lakeshore Committee Citizens Group - 1986
- Commission formed - 5 people, 1988.
- Water quality became a major objective as beach was shut down several times.
- Capacity Study.
- Survey lakeshore owners along Lakeshore Drive: ownership, frontage, acreage, septic systems.
- Exit Poll at election - asking
 - Are there too many boats?
 - What is prime use?
 - Access, conflict of use
- Harbormaster position initiated, was purely educational to start, now enforcement. Suggested Harbor Commission - was never initiated, marinas feared regulations.
- Fishing Access - assessed problem, recommended improvement, asked users group. Hired attendants for access.
- Windemere Way - improvements, was eroding.
- Septic issue - met with Selectboard, Committee established to address.

Mission

Malletts Bay Advisory Commission - intent to be an educational catalyst and to read the "pulse" of the community - and pass this on to the parties that need to know. Have focused on Inner Bay and water quality.

Note: The Malletts Bay Advisory Commission was disbanded in the fall of 1994.

Interview: Dick Mazza
Mazza's General Store, Owner
30 Aug 94

Issues:

- Not going to have big over - development of boat traffic, crowding is not an issue.
- Marinas in Malletts Bay are outdated.
- Septic systems - limiting expansion potential.
- No direct access to Outer Bay.
- Fairly nice beach, but not the best.
- Lacking facilities like restaurants, hotels, and cottages; 30 years ago Malletts Bay was very busy.
- Water quality is an issue that is being addressed.
- Extensive redevelopment will not likely be successful:
 - short season
 - too much tourist competition in Burlington
- Limited redevelopment, at a slow pace, would be good.

Suggestions:

- Marinas need to update their facilities if wanting to attract more boats.
- Improve the septic situation.
- Provide more boat access.
- Thayers Beach - a very large lot, will be for sale, consider for access.
- Provide more facilities for visitors to compete with N.Y. State.
- The Business Association does a good job of "controlling" what types of business come in.

Interview: Jake De Forge
Malletts Bay Marina
30 Aug 94

Issues:

- Sewage: lots of studies on boat counts, trying to promote more uses, can't support any of it without a sewer system.
- Wants a guarantee he has his moorings; he takes his out every year, marina has been there since 1936.
- Demand and use is down: Canadian exchange rate and economy is down.
- Zoning severely restricts what you can do: 100' setbacks from water and 45' setback from road.
- Difficult process to get approval for improving facilities.
- Sailing, lots of races, not really a conflict, but need to keep clear of throughways.
- Conflict between fishing with downriggers and motorboats.

Suggestions:

- Education best way to make improvements.
- Town should not be involved in enforcement.
- Enough studies - do something.
- Town should acquire Thayers Beach.
- Need channel markers through Inner Bays, the "Gut" and onto the "Cut."
- Marinas need to be fairly represented in the Town.
- Could see Town designating an area for sailboat racing.
- Need better education and communication between the users - maybe an annual party, something fun, for the different boat groups to talk together.
- Power squadron, boater education, is good; should be expanded to include all boat types, explain how other boats operate.
- Jetski users will go through same process as snowmobiles; get associations, educate on appropriate behavior.

Interview: Paul Brown
Lakeshore Redevelopment Committee
31 Aug 94

Lakeshore Redevelopment Committee is looking 10-15 years down the road with a goal of providing a place for people to anchor in Malletts Bay.

Issues:

- Septic/Sewer - is main issue; can't expand or build anything unless a sewer is built.
- Need facilities for public: public dock, sidewalks/walkways, places to walk to.
- Tourism is important to provide an economic base and decrease local taxes.

Suggestions:

- Long-term study for lakeshore redevelopment underway.
- Build the sewer system.
- Revise zoning regulations to encourage appropriate development, village character, pedestrians.
- Provide public dock for pedestrian access to water.

Interview: Scooty Roberts

Lakeshore True Value Hardware and Marine, Owner
31 Aug 94

Issues:

- Malletts Bay is less crowded than in the 70's and 80's. Don't know if it will ever come back to that level. Would love to see more tourist traffic.
- Highway is congested, lots of local and through traffic.
- No public access to Thayers Beach from land.
- Only 3 recognized mooring areas on Lake Champlain; two are in Malletts Bay.
- Moorings take a lot of room; most people with motorboats seem to prefer docks while sailboat owners prefer moorings.
- Personal Watercraft getting to be an issue, but not a big one.
- Public Trust - don't want to see the issue come back alive.
- Fishing, from what he hears, is better than ever - the lamprey program has helped.

Suggestions:

- Upgrade the highway where it is; not sure the circumferential highway is worth it.
- Town should buy Thayers Beach and provide access from the road. It shouldn't be developed privately.
- Most uses are self-regulatory, not much need to regulate.
- Lamprey control is good, keep it going.
- Much could be done to improve Malletts Bay, potential is great, need people with common sense.
- Need more public access to the lake.

Interview: Peter Hill

The Moorings
1 Sept 94

Issues:

- The sewage and the ability to keep the lake clean is main issue. If can't keep the water clean, everything else is wasted effort.
- Highway congested by locals and commuters; 17,000 cars a day.
- Public access to bay is limited.
- No conflicts between educated user groups.
- Biggest complaint often heard is about wakes from big power boats passing through the Narrows off Malletts Head. There are 5 mph buoys along the shore.
- Northern causeway - difficult passage; they would never dredge, but it would be great if they would.
- Bike Path - need to resolve the cut.
- Thayers Beach - Town tried to convince owners to donate, think they are not interested in donating but potentially interested in selling, not sure.
- Boats anchoring near public beach.

Suggestions:

- Need public education to get sewer built.
- Support the Circumferential Highway to remove commuter traffic from local traffic.
- Three types of access needed:
 1. Boats onto lake
 - expanding public access
 - recognizing commercial marinas as providing low-cost access
 2. Land based pedestrian/shoppers/restaurant-goers - access for walking along and viewing bay.
 3. Boater's access to shore, beach, facilities, and activities. Many places have municipal dingy docks.
- Need to upgrade existing facilities/accesses
- Could learn a lot from Lake George and N. Y. State in general.
 - Good seawalls
 - Handicap access docks for fishing
 - Coin-operated pump-out (make it easy, so people will use)
 - Strict enforcement of DWI laws
- Need entry education process, could be other boat groups required to take Boater Safety Course.
- Need cruising books and brochures advising of docks, restaurants/a for-profit venture.
- Malletts Bay potential State Park should be like Waterbury Reservoir Campground.

Interview: Bill Dunnington

Lakeshore resident and Ex-Planning Commission

1 Sept 94

Issues:

- Speed is the real problem, especially on weekends; too many boats, too fast.
- Would like to ban cigarette boats, personal watercraft, and surf-riders:
 - Personal Watercraft - had same problem as snowmobiles, rejection by public because of noise and reckless behavior; associations - educate members and better muffler systems are helping.
- Public Trust Document - conflicting decisions on.
- Boats - general lack of awareness of "rules of the road."
- Canadian holding tank with Y valves allow pumping either into water or tank, required to disconnect, not always sure they do.

Suggestions:

- Marinas and renters of personal watercraft should educate on appropriate behavior (Marble Island seems to do pretty good job).
- Colchester Mooring Management is a good step; opposed to the State keeping their fingers in the Bay.
- Need ground rules for where moorings can be placed - for future problems.
- Public Trust doctrine needs to be finally defined/clarified by the General Assembly.
- Private enterprises along the shore need more controls to protect views and aesthetics.
- Stacked dry storage need to be required to be hidden.
- Customs should be informing Canadians of Vermont boating regulations.
- Inspection of boats from Canada to be sure the Y valve of holding tanks is disconnected.
- Coast Guard Auxiliary is useful organization should encourage their continuance.
- Could consider the whole Inner Bay as a Designated Anchor Area so boaters would be more responsible, not expecting boats to be lit at night.
- Need to maintain fairways, Coast Guard need to put on charts.
- Thayers Bay - would be great if town owned; probably not within means.

Interview: Bob Schumacher

Canoe Imports

1 Sept 94

Issues:

- Seems like it would be impossible to manage recreation use.
- Malletts Bay too crowded for most canoers, not really a problem, there are other places to go that are more suitable.
- Everyone needs to share the resources, give and take.
- Moorings are an issue, but don't think overall numbers can be restricted.
- Noise is the most objectionable issue and the easiest to fix - mufflers.
- Sometime canoes/kayaks use Malletts Creek and north shore.

Suggestions:

- Better muffling systems for boats, jet skis.
- State Park - probably not worth putting an access there, not convenient.
- Should expand existing access, but not improving access does keep a limit on volume.
- Don't try to accommodate canoes/kayaks on Malletts Bay, too late, not a destination.

Interview: Dr. Reubman

Lone Pine Campground

1 Sept 94

Owens campground with 20,000-30,000 people/season.

No lake frontage and few of his customers are boaters.

Issues:

- Malletts Bay was once lively, now going downhill. His guests head to Burlington, nothing to do at Malletts Bay.
- Sewer is key issue. Malletts Bay is getting to be a cesspool.
- Developers afraid of doing anything around Malletts Bay. Town too restrictive, unknown septic resolutions.

Suggestions:

- Malletts Bay needs healthy growth.
- Private/public partnership to develop boat accesses.
- Encourage private investment.
- Create pedestrian amenities: sidewalks and places to go.
- Circumferential highway - not sure it is necessary, upgrade existing road.

Interview: Robin Dolen
International Sailing School
2 Sept 94

Offers sailing classes and limited rentals of sailing vessels. Most classes stay within Inner Bay, very protected.

Issues:

- Many motorboaters have little respect for the lake and what it can do.
- Malletts Bay Boat Club seems to keep adding moorings, invading the area; but they do a good job with their moorings using top of the line equipment.
- Public Trust Doctrine - confusion on how to identify mooring area. People use to draw lines out from their property line.
- Great that the town is coordinating the moorings to avoid future problems. They should have been quiet about it; caused many people to chuck a bunch of moorings out there and rent them out.
- Sees themselves as a "public facility" - always have a couple mooring available to rent, never a waiting line.
- Not much congestion, at least compared to Long Island Sound where she grew up. Congestion is only on a beautiful weekend day.
- Motorboaters and jetskiers need to learn to "give distance" and respect.
- Personal Watercraft are really annoying; making donuts, staying too close to other boats, making waves. Need to find their own spaces.
- Motorboaters need to know not to cut through race courses.
- Sailing through the Narrows can be tricky when there are lots of wakes; but wouldn't want to see this be a no-wake zone - would only cause congestion.

Suggestions:

- VT State Police and Harbormaster presence is good, makes everyone more safety conscious, should keep up the presence.
- Both the U. S. Squadron and Coast Guard need to expand their programs to require on-water testing, not just written tests. Same with Canada. Could have private enterprises work with State to implement the training.
- Wouldn't recommend more access, that would add to congestion. If did add an access, put it in Outer Bay, monitor and limit use.
- Personal Watercraft need better muffling system.
- Everyone needs to learn the rules of the road, respect other boaters, find their own space.
- Should repeal the law requiring Canadians to pay 4% of the value of their boat if they stay in U. S. water locations more than 30 days; which severely discourages their use and spending dollars.
- Sailboats need to be conscious of fishing boats.

Interview: Betsy Orselet
Recreation Director, Town of Colchester
2 Sept 94

Programs and Plans:

- State Park - have a plan developed with lots of public participation; includes mostly low impact use, interpretive center, trails. No access planned, not a good location for it.
- Thayers Beach is on the market for 1 1/2 million with pretty limited development potential due to extensive wetlands. Colchester Land Trust looking into it. Would be ideal for a park, beach, and access.

- Bayside Park has extensive scheduled recreation activities through Town programs:
 - Swimming classes, day camp, tennis classes, soccer camp, canoeing classes through high school and St. Michael's. Life guard only on duty during programs.
 - Not used much by general public.
 - Water quality is a concern, it is tested 4 times/week. If fecal coliform is higher than 200 ppm for two days in a row, close the beach.
 - Protection of swimmers from boaters and personal watercraft; boats often anchor too close, need to post 200' out. Some occasionally try to dock - is well posted.
 - Sand brought in every year, weed growth when not much use.
- Causeway Park and Bike Path: Town and Greenway Committee have been developing a plan, did some restoration work. Would love to see a ferry implemented at the Cut.
- Windemere Way and Heindeberg - two access on Winooski. Windemere recently upgraded - many motorboats. Heinenberg is low key, mostly shoreline fishing, and canoe and kayaks.

Interview: Tom Cousino

Diver, Victory Sports

9 Sept 94

Victory Sports has been teaching diving class since 1953.

Issues:

- Biggest concern is lack of recognition of the diver down flag, required 200' distance, though there have been some close calls, no accidents with divers in Malletts Bay that he knows of.
 - Many people not covered by the marina education program don't know the flag.
 - No education required for boat rentals, concerns for everyone's safety.
- Access is very limited, fishing access on a busy day is panamonia.
- Malletts Bay has several great diving locations: reef in southeast Inner Bay, islands off Malletts Head, Thayers Reef. Outside of causeway are several more: west side of Providence Island, two reefs south of Stave Island, old lighthouse base, and the "Phoenix", an underwater preserve at Colchester Shoals with an old steamer wreck.
- Has seen up to a dozen flags on a nice weekend day which could represent 60 divers.
- Spread of Eurasian milfoil is a concern.

Suggestions:

- Boating access should have hose down to decrease spread of Eurasian milfoil.
- Laws and regulations should be sent with registrations every year to cover the people who are grandfathered from the Boater Safety Course.
- Everyone needs to be better educated about the Diver Down Flag. He has printed up and distributed piles of information flyers.
- More access should be developed.

Interview: Inge Schaefer

State Representative, Resident of Colchester, Sailboat owner

9 Sept 94

Issues:

- First concern is water quality, pollution of the bay. Pollution always registering high at fishing access. Middle School is polluting Smith's Creek which dumps into Malletts Bay.
- Boat traffic, particularly the impact on Lakeshore Drive. The Fishing Access creates a nightmare on the road. Concerns that an improved fishing access will increase traffic on roads.

- Boat traffic on the water doesn't seem to be dangerous as yet. Doesn't seem to need to be controlled.
- No laws saying who can buy or use a boat. Registration and Boaters Safety Courses are good.
- Need to find ways/enterprises which allow non-boat-owners to get out on the water.
- Bayside not overcrowded. Ample swimming opportunities.
- The Cut is too narrow and shallow.
- As a sailboat owner, was concerned about whether they would still have mooring when the Town started implementing Mooring Management.
- Many motorboaters may not realize the effect of their wakes and that they are legally responsible for it.
- Motorboaters generally are respectful of sailboats.
- Boaters generally help each other, generally respectful.
- Coast Guard used to have greater presence, now see more of Colchester Police. That presence helps; keeps people cognizant of regulations and safety.
- A lot of boaters don't really know the laws.
- Concern about drinking while boating. Is part of the recreation experience. Penalty for BWI may not be strict enough.

Suggestions:

- Encourage charters or other private enterprises that provide access for non-boat owners - similar to Ethan Allen Charters in Burlington.
- Malletts Bay State Park should be implemented, and include, a campground.
- The Cut should be dredged and widened. The Army Corps would be the ones to do it, and won't do it for only recreational use, only for commercial, state, or federal use. Can't see taxpayers paying for this.
- Send updates and simplified laws information with state's registration or with Town mooring stamp. Example: "life preservers required to be worn by children up to 12 years old," "no wake zones," and "you are responsible for your wake."

Interview: Diane Choiniere
Personal Watercraft User
The Marine Collection
12 Sept 94

Issues:

- Concern of restricted use for personal watercraft.
- Not sure that boater safety course addresses personal watercrafts.
- They are noisy.
- Watercraft provides opportunity for people like her who are not comfortable with a bigger boat, access to the water by herself; and are affordable.
- Some government agencies are starting to use them as police boats.
- Are required to be registered, use life jackets, and carry a fire extinguisher on board. Cannot use at night. Must be 16 years old or older.
- Many are not aware that they are designed to do tricks: to turn in tight circles or dip in and out of the water - that this behavior is not reckless.

Suggestions:

- Education is the key. Law enforcement needs to learn what the watercraft is designed to do.
- Watercraft users need to be educated in respectful driving:
 - Don't jump wakes, stay away from other boats.
 - Don't operate repeatedly near a residence, can be annoying.
 - Be in control.
 - Don't drink and drive.

- Consider having canoes and kayaks required to be registered also, to alleviate those who feel they are not helping to pay for public accesses.
- Conduct boat inspection before boat is launched or in the ramp area. Causes more congestion.

Interview: Rick Harrison
 Marble Island Resort
 12 Sept 94

Permitted for expansion of docks and construction of a breakwater. Consider themselves a family recreation resort, is not a private club. Includes overnight accommodations, marinas with docks and dry docks, golf course, and restaurants.

Issues:

- Malletts Bay was a haven in 1920's - 1950's. Then had been relatively busy in the 80's. Now have many vacancies. Not much commercial activity.
- Give charts and safety instruction to all renters of boats.
- The Narrows - all the boat traffic goes through, it's not that crazy.
- Marble Island offers free docking for visitors; \$1.75/foot/night if want to dock overnight.
- There will never be much commercial winter use; people have tried, not successfully.

Suggestions:

- Clarification on Town's perspective on moorings and increased public access.
- Clarification of permit process.
- Support commercial growth, facilities, places to go at Malletts Bay.
- Recognition of marinas offering a level of public access.

Interview: Jim Goldman
 The Boatworks
 12 Sept 94

Issues:

- Too much studying and no action.
- Moorings are a waste of space, and unsafe, totally against.
- Access area needs control.
- Totally against management of moorings and docks, Town shouldn't be doing it.
- Malletts Bay Boat Club and Three Island Boat Club use moorings, most everyone else uses docks.
- Do need more public access.

Suggestions:

- Ideal World
 - Private property = X moorings or X moorings for Y' of frontage.
 - Commercial marinas, clubs and associations all should be docks. There may need to be some exception for sailboats needing more depth.
- Don't regulate docks.
- Add another public access.

Interview: Bob Miller
Snowmobiler and Angler
Vermont Association of Snow Travelers (VAST)

Issues:

- Permanent moorings are a hazard in winter for snowmobiles. He received 100 stitches in his face last year for hitting a permanent mooring in Malletts Bay. The ice is a public highway.
- Minimal winter activity around Malletts Bay, missed opportunity.
- Bike path process resulted in losing a segment of snowmobile trails.
- VAST doesn't back up any trails crossing frozen water because of liability; but there are lots of uncharted trails across the ice which are used regularly by snowmobiles.
- Fishing access still supposed to give priority to fishing and outdoorsmen. Fishing access overcrowded, could be better managed to keep boats moving and park more vehicles. Could charge a fee for non-fishing boats to help pay for.

Suggestions:

- Permanent moorings should have flags 5' in air for visibility in winter and should be permanently marked with name and address of owner.
- Colchester should host a winter festival like Lake Morey's in Southern Vermont. VAST would work with Town on this.
- Vermont should have a state association for snowmobiles.

Interview: Lee Rascoe
Access Committee and Avid Angler
1 December 94

Issues:

- Malletts Bay Access is the only State access with paid attendants (through the Town Police). However the attendants need training in keeping the traffic flowing.
- Winter fishing - it is very dangerous to get out to the Outer Bay from the Public Access.
- Need another access for boating and fishing to take pressure off the Fish and Wildlife Access.

Suggestions:

- Train attendants at the Fish and Wildlife Access.
- Add a boat launch access at either end of the Causeway, for both summer and winter access, and the Causeway itself would provide good shoreline fishing. Need parking.
- Dredge the Sand Bar to relieve pressure. Would likely be difficult to get permits.
- Add fishing pier at Bayside Park; but the slope may be a bit prohibiting.

Information:

- Access Committee takes care of docks at the fishing access and removes them in the winter. The docks are stored at the Malletts Bay Marina.
- Two sections were added to the Fishing Access docks in 1994. The Bass Masters paid for the steel and hardware, the State paid for the wood.
- Trout Unlimited is also involved in accesses. They installed docks in St. Albans.
- Many ice anglers get on ice across private property of Porters Point.
- Commercial fishing is getting bigger. Would estimate about 30 boats on a weekday, not much during the weekend.
- Windemere Access provides bank fishing.

Public Meetings

A series of eleven Public/Steering Committee Meetings and Workshops have been conducted through the process of developing the Malletts Bay Recreation Management Plan. Five of the meetings were presentations of draft analysis reports for review by the Steering Committee including:

- Institutional Review Analysis
- Review of Relevant Studies and Programs
- Use Survey and Use Counts Results
- Natural and Built Resources Inventory
- Recreational Use Analysis

A week before each of these meetings the Steering Committee was mailed a copy of the draft report to be reviewed. At the meeting, the appropriate consultant would present a summary of the report and the Steering Committee and attending public would provide review comments discussing the findings, noting where project findings did or did not reflect their experiences and correcting place names.

Three Public Workshops were conducted at points in the project where “brainstorming” was of most value. These three workshops were:

- Identifying Goals, Objectives, and Issues - at the start of the project.
- Developing Strategies to Address the Issues - scheduled at the end of the analysis period and before the policy formation.
- Developing Strategies to Address Moorings, Docks, and Anchorages - scheduled during the series of meetings to finalize the draft Recreation Plan.

The format of the Workshops was as follows:

1. Introduction and Review of the issues to be addressed in the Workshop.
2. Workshop Groups: the attending public and Steering Committee members would break into small groups provided with background information, a base map, and markers, and brainstorm on the issue at hand.
3. Wrap-Up: Large group discussion for each Workshop Group to present their ideas and the group to discuss.

These workshops were very productive and informative. They provided an opportunity for people with differing interests to meet with each other and find common ground; allowed the consultants an opportunity to greatly increase their local knowledge; and generated many creative strategies to address the most pressing concerns.

Two more Public/Steering Committee Meetings were held to refine the specifics of the Draft Recreation Management Plan. And finally, one Public/Steering Committee meeting was held to present the Final Malletts Bay Recreation Management Plan.

Chapter Three: Recreational Use Analysis

Appropriate Recreational Use Areas and Mixes

Appropriate Mixes of Use

From the survey results, the greatest number of conflicts were found occurring between **motorboats** and all other user groups (with the exception of personal watercraft), with complaints of high speeds, passing too closely and the resulting near accidents, high wakes, and excessive noise. It would be unrealistic to attempt to separate motorboats from all other use types given the relative number of motorboaters and unimaginable task of informing motorboaters of "their area," and the simple fact that this would not eliminate the conflicts, as many of the complaints about motorboaters' behavior were made by other motorboaters. As much of the complaints reflected illegal or ill-mannered behavior, conflicts would be better addressed through increased education and enforcement, rather than a separation of uses.

There were also numerous complaints about **personal watercraft**, regarding the repeated noise and their behavior. According to a personal watercrafting enthusiast, most people do not understand that personal watercraft are designed to perform "stunts" such as dipping in and out of the water and turning in tight radii. This apparent "erratic" behavior is disconcerting, if not dangerous to other boaters in high traffic areas. Therefore, it may be desirable to identify an area for personal watercraft "stunt-riding." This area would need to be located where the noise would have the least impact on shoreline residents.

There were a few complaints regarding **water skiing** too close to moving and moored boats. A separate area could be identified for water skiing, but would need to be large enough to minimize conflicts between water skiers. Two specialized water skiing areas are currently identified in the Outer Bay: a slalom course and a waiver for local Brown Ledge Camp campers to waterski within 200' of the shoreline. Current levels of conflicts reported do not seem to warrant immediate implementation of this management strategy.

There were a few complaints of **fishing boats** anchoring in the Cut and the Narrows causing congestion in these areas of navigation, and a few sailors complained of fishing boats anchoring in the midst of sailing race courses. These conflicts could be best handled by time/space separation. Fishing and anchoring is not presently permitted in the Cut, but is not strongly enforced. Public education could be developed to recommend not anchoring, fishing, or water skiing in the Narrows during specific hours on summer weekends. Information on the location and times of the sailing races should be widely distributed and displayed.

Appropriate Use Areas

It should be noted up front that the map of Appropriate Summer Recreation Use Areas (see Figure 16) reflects a busy summer weekend day with favorable weather and winds. For instance, on a quiet mid-week morning, paddlers may find they have the whole bay to themselves.

Motorboat Cruising, Sailing, and Sailboat Racing: The areas that are suitable for the greatest diversity of uses are the large expanses of open water in both the Inner and Outer Bays. These areas are particularly appropriate for motorboat cruising, sailing, sailing races, and deep water fishing. The northern parts of the open expanses are better for sailing given the predominant southwest summer winds, while the southern parts offer calmer waters for motorboats on windy days. Sailing races should continue to be scheduled on a regular weekday evening to avoid conflicts with fishing and motorboating.

Motorboat Anchoring: Areas suitable for day use motorboat anchoring are along Thayers Beach offering calm, shallow waters with minimal weeds. The southeast area of the Inner Bay also offers protection and includes a special anchoring area suitable for both motorboats and sailboats.

Sailboat Anchoring: The coves of the north shore of the Inner Bay offer deep waters and some wind protection suitable for the anchoring of sailboats. The southeast area of the Inner Bay also offers protection and includes a special anchoring area suitable for motorboats and sailboats.

Fishing from Boats: Nearly the entire perimeter of both bays out to an approximate depth of 15' is well suited for general fishing while the deeper water provides fishing for lake trout and smelt in the summer. Some sailing and motorboat users expressed concerns in the interviews and surveys of fishing boats anchored in the Narrows and the Cuts compounding these highly traveled areas. Some consideration should be given to restricting fishing in these navigational areas during busy hours on high-use weekends.

Shoreline Fishing: Two strips of shoreline are identified as appropriate shoreline fishing areas including along the Causeway and along the south shore of the Inner Bay. Parking and access would need to be improved for public shoreline fishing along the Causeway.

Personal Watercrafting: Personal watercrafting could occur nearly anywhere given the minimal required depths of water needed and the maneuverability of the vessels. Like motorboats, personal watercraft are required to travel at less than 5 mph if less than 200 from shore. Many shoreline residents object to the noise of personal watercraft staying in one area. Therefore, an area for personal water craft "stunt-riding" is identified 500' from the shore along the Causeway, providing relatively calm waters, out of the general traffic flow, and where the predominant winds will carry the sounds farthest from shoreline residents.

Windsurfing: Two windsurfing areas are identified offering exposure to the predominant southwest winds. The northern Outer Bay area is suited due to significantly less boating traffic, while the shallow depths are convenient for beginners.

Water Skiing: An area near the southern shore of the Outer Bay provides an ideal water skiing space with an expanse of fairly calm open water, out of the general traffic flow, and with a sandy, non-weedy bottom. Part of this area is already an established water skiing area, for a slalom course.

Swimming: A review of sandy shorelines through the GIS soils data layers and shoreline slopes identified existing and potential swimming areas including: Bayside Park (sand is brought in for this beach), Thayers Beach, Niquette Bay, Nourse's Corner, and a small area at the southern end of the Causeway. Of these, only Bayside Park is officially open for public use. Thayers Beach, though privately owned, receives a lot of public use; access is currently limited to boats. Shoreline access would require crossing an extensive wetland. The Malletts Bay State Park includes an area of sandy beach, but the immediate water is fairly weedy. There may be some potential of enhancing this area for swimming when the plans for the State Park are implemented. (Implementation is not schedule at this time.)

Scuba Diving: Areas for scuba diving are identified along the steep, rocky shorelines along the north shores of the Inner Bay, around the islands off Malletts Head, and at shoals in the south east parts of both the Inner and Outer Bays. The Colchester Shoals and the historic preserve, the "Phoenix", are popular diving areas just outside the Causeway in the Broad Lake.

Canoeing/Kayaking: Paddling areas are identified on Malletts Creek and the north shores of the Inner Bay, the area of the Lamoille River and the Sand Bar Wildlife Refuge, and the southern shores of the Inner and Outer Bays. The identification of the southern shore of Inner Bay conflicts with the current density of moorings, while the southern shorelines of both Inner and Outer Bays are generally too

crowded for pleasurable paddling. Avid paddlers have stated in conversation regarding recreation planning that they do not expect to be accommodated in Malletts Bay, stating there are other areas better suited. However, these were generally avid paddlers willing to drive to a destination. Malletts Creek, Lamoille River, and the Sand Bar Wildlife Refuge can provide enjoyable paddling with minimal conflicts with other boating types.

Navigation Routes: A major navigation pattern is identified as to and from East Spaulding Bay and east of Coates Island, through the Narrows, then dividing between a route to Thayers Beach and a route out through the Cut to the Broad Lake. The Narrows was reported through the surveys and interviews as an area with excessive conflicts, particularly boats passing too closely and quickly to other boats and the shoreline. The level of conflicts reported suggests the need for immediate management. Options include: increased education of boating "rules of the road" and etiquette, increased enforcement, and/or navigation markers. Some sailors who were interviewed expressed concern of placing markers or otherwise slowing the traffic through the Narrows may only compound the congestion.

Proposed Appropriate Summer Recreational Use Areas

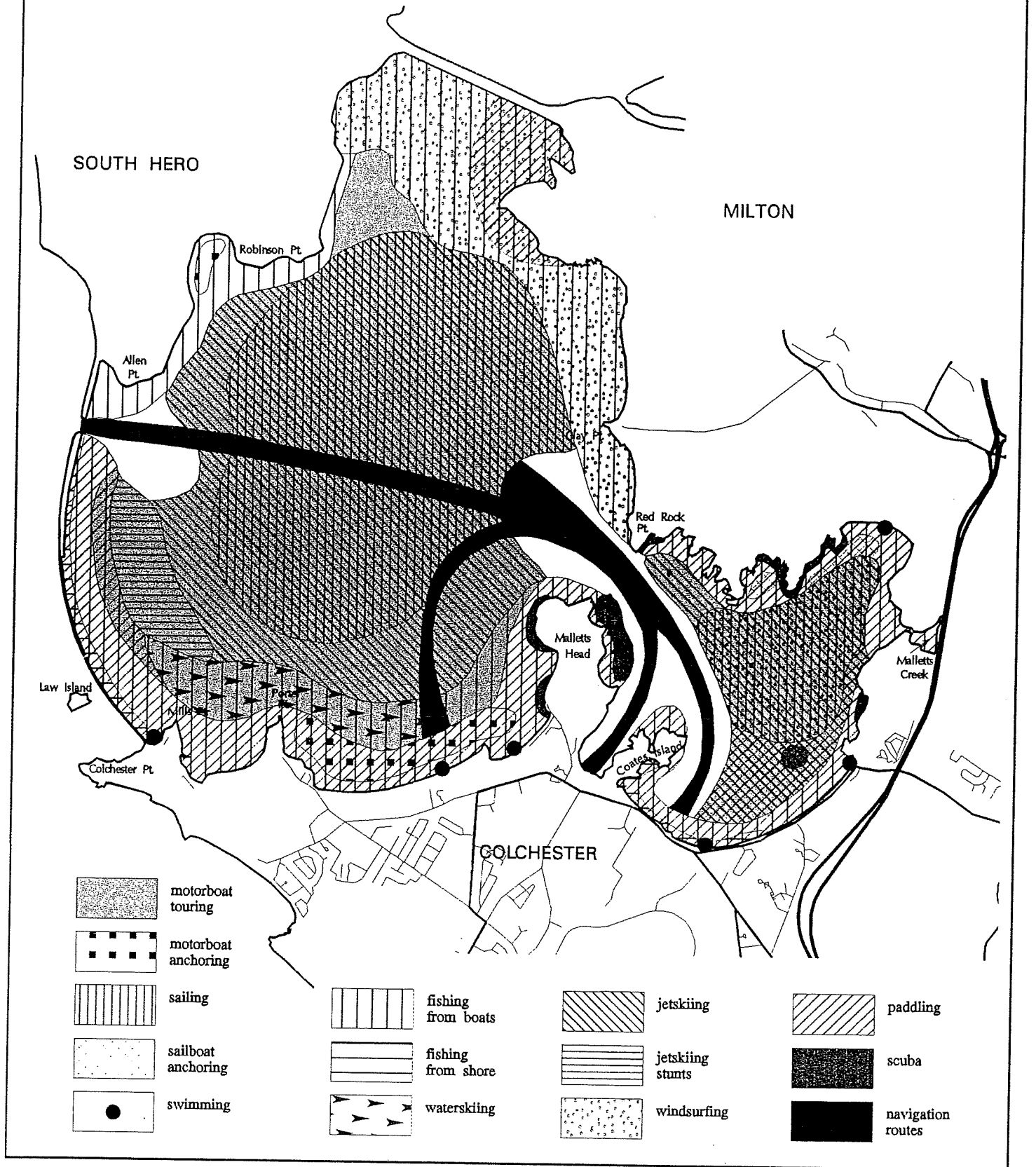


Figure 16

Appropriate Recreation Facility Locations

The requirements of many of the facilities suggest locations in the Inner Bay (see Figure 17).

Mooring Areas: Mooring areas are generally located within protection from wind and wave action, and in areas of five to thirty feet of water depth where bottom conditions allow a firm hold. Nearby parking and access to the water is a must. Most suitable areas are along the south and west shores of the Inner Bay.

Public Access Areas: While the intensity and activity of the access type determine many of the locational criteria, all such areas require suitable on shore conditions of gentle slopes, convenient road access, and adequate parking.

Boat ramps require protection from wind and wave action and adequate depth of water to open water areas. In addition to the existing public ramp, many areas in the Inner Bay could have the best conditions; however, additional motorboat access in the Inner Bay would likely compound existing conflicts and perceived crowding. Much of the Outer Bay is limited by very shallow conditions or exposure; however, access for small boats could be located in the Thayers Beach area or at the base of the Causeway, which would require addressing road access and shallow water depths.

Car Top Launch Access can be much more informal and could be located at almost any available shoreline where shore conditions are not too steep to allow at least light boats to be carried into the water or to the waters edge. Possibilities are broad, but two locations in the Inner Bay could be developed. One at Nourse's Corner and/or one at the State Park (or in Niquette Bay). These are near Malletts Creek and the north shore of the Inner Bay where paddlers have identified as preferable areas for paddling with fairly good road access.

Observation areas are possible where the road network extends, or can be extended, to the water's edge, or on accessible sites with vistas overlooking the water.

A **boathouse** or community water front facility would best be located along the developed shore of the Inner Bay - i.e., primarily along the south shore.

A **winter access facility** would serve the needs of ice anglers, ice boaters, skaters, snowmobilers, and could be part of a year round facility with a boathouse, or could operate from one of the marinas where facilities could be adapted to meet such needs. The potential Causeway access would be a valuable winter access.

Marinas: Again looking for protection and access, adequate water depths for moorings and dockage, as well as available utilities, the Inner Bay is the more suitable area. Prime locations are the areas where existing marinas are located along the south and western shores of the Inner Bay.

Beaches: Naturally sandy beaches are clearly identified as the prime locations. Water depth, access, and exposure are important additional considerations. The State Park and Thayers Beach are prime areas.

Shoreline Parks: Many sites could be suitable for varying types of parks - with either or both passive and active on-shore, water related activities. The privately owned Thayers Beach is currently highly valued as a swimming area, accessible only by boat, and should be a high priority to acquire or in some means ensure continued public use. The State Park plan should be implemented and the Bayside Park improved.

Fishing Pier: Adequate water depth, access, parking, and relationship to other active uses limit the best possibilities. The railroad Causeway and the shoreline of the Inner Bay are the most likely sites.

Tour Boats: Probable locations are at marinas or public waterfront facilities with plenty of parking.

Marine Environment Educational Facilities: One site is suggested at the State Park on the north shore.

Public Camps: Sites combining suitability for parks, small boat access, swimming, open space, and adequate utilities would be ideal for such camps.

Restaurants: These facilities can serve the water users as well as those shore bound who would like to dine at the water's edge. Best locations are in the Inner Bay with access, parking, and utilities.

Appropriate Summer Recreational Facility Locations

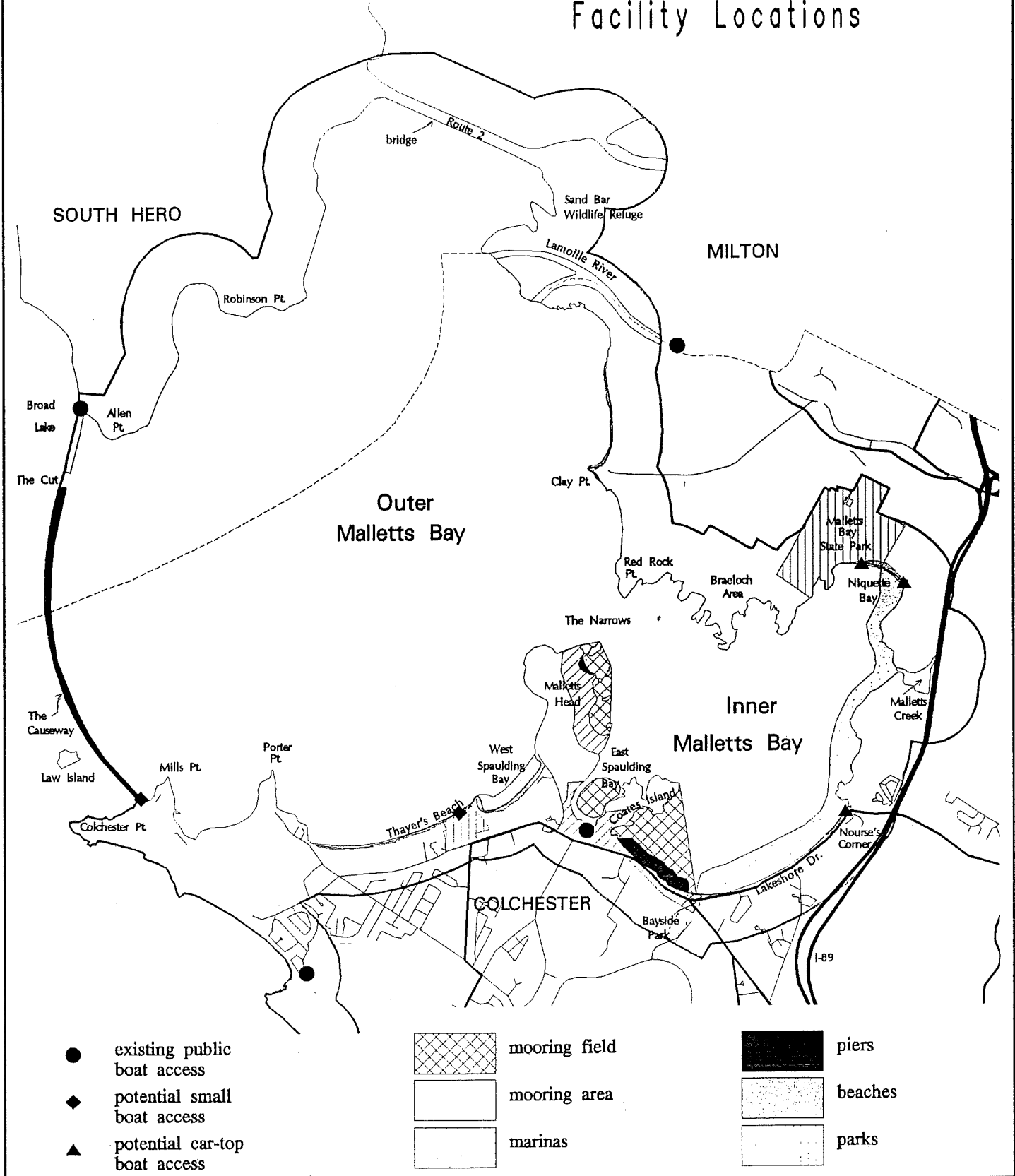


Figure 17

Recreational Carrying Capacity

The recreational carrying capacity of a water body is the level of use the area can sustain before there is an unacceptable decline in the quality of the recreational experience or natural resources (Pigram 1983). Carrying capacity is commonly defined by some measure of the physical, economic, ecological, and/or social limits.

Physical Constraints Limiting Recreation Use

Physical carrying capacity generally refers to absolute space requirements, safety concerns, and the availability and amount of support facilities such as parking spaces and boat ramps. The development of uniform space standards for boating is difficult due to significant variations between lake size, depth, extent of development, and shoreline configuration. Several studies have attempted to connect use levels or densities with user satisfaction generally finding little correlation. According to the Army Corps of Engineers, space standards are of limited use on water bodies with a wide diversity of users and conflicts.

As can be seen in Table 8, there is little agreement among recreation managers on the boating space standards. The general standards range from 1 acre/boat as suggested by the Army Corps of Engineers, 20 acres/boat by the Wisconsin Department of Natural Resources, to 50 acres/boat in Manitoba. While examining the standards within specific activities the ranges are only slightly diminished. For water skiing, Foggs (1981) suggests 3 acres/boat while Louisiana Park Recreation Committee recommends 40 acres/boat. Recommended standards for fishing range from 1 to 8 acres/boat; sailing from .25 to 8 acres/boat; and so on.

A 1989 capacity study focusing on the Inner Bay of Malletts Bay utilized 20 acres/boat as a general standard and calculated that "105 boats can actively use the Inner Bay at any one time without undue conflict between different users" (The Henderson Group, 1989). As a quick look, the water surface of the Outer Bay is approximately 12,000 acres, and the Inner Bay includes about 2,100 acres. If we subtract unusable surface due to shallow depths, constricted bays, moorings, and the 200' no wake safety zone, we remove about 1400 acres from the Outer Bay and 600 acres from the Inner Bay. Using the unsubstantiated "20 acre/boat standard," the remaining usable surface of the Outer Bay is 10,600, acres which would have a capacity for 530 boats, while the Inner Bay's usable surface would be about 1,500 acres, able to accommodate some 75 boats. These figures, though interesting, are unsubstantiated and should not be considered as the ultimate limit for boat quantities on Malletts Bay.

Physical constraints of Malletts Bay appear most limiting for finding suitable locations for future shoreline facilities that will encourage and accommodate increased volume of uses, while not compounding the existing problems of perceived crowding and conflicts between boaters in the Inner Bay and the Narrows. The perceived crowding reported earlier appears to be resulting from a combination of the consolidation of facilities in one area and disrespectful boating behavior. Currently, the Inner Bay provides the majority of the access, moorings, and facilities for boaters. From the study of appropriate locations for recreation facilities (Figure 17), it becomes apparent why the facilities have developed along the southern shore of the Inner Bay. This area provides protection from winds and waves, has adequate water depth for docks, moorings and access ramps, and easy vehicular access from Lakeshore Drive. However, Lakeshore Drive is narrow and overcrowded. A traffic study and improvements would likely be required before implementations of expansion of any facilities would be permitted. The proposed continuation of the Circumferential Highway may alleviate some of the traffic pressure.

Boating Space Standards
(Acres per boat)

Authority ^a	General Standard	Non-Power	Power (unspec.)	Power (< 10 hp.)	Power (unlimit.)	Sailing	Water Skiing	Fishing
Allegheny Nat. For. (3)		1		5		1	20	1
Bur. Out. Recr. (1977)				2-10	3-18		7-20	
Calif. Recr. Comm (2)	1							
Corps of Engineers (1)	1							
Fogg (1981)		0.5		0.5	3	0.25	3	0.2 ^b 0.5 ^c
Grt. Lks. Basn. Comm. (1975)			10					2
Jaakson (1984)		0.33	20			1.25	40	8
Louis. Park Recr. Comm. (1)								
Manitoba (3)	50							
Mn. Dept. Nat. Res. (3)	10							
New York State (1978)		1	6-8			6-8	15-20	
New Hampshire (1985)		1.5			8.8			
Ohio Dept. Nat. Res. (2)				5.5	7.5			
Ontario Min. Hsg (3)	10							
Sirles (3)	0.8-1.8							
Soil Conserv. Ser. (1)			3			3	5	0.2 ^b 0.35 ^c
Sowman and Fuggle (1987)			5				20-40	1.2-10
Tichaoek (3)		1		10-20		2	40	8
Wisc. Out. Rec. Plan. (1)			20				20-40	8
Wisc. Dept. Nat. Res. (2)	20							

a See the following for complete citations

- (1) Bur. Out. Rec. (1970)
- (2) Eberwein (1984)
- (3) Barstad and Karasov (1987)

b anchored fishing
c trolling fishing.

Table 8

Source: U. S. Army Corps of Engineers, *Recreational Carrying Capacity and Application to Lake Management*, Section 22 New Hampshire, May 1989

The Outer Bay offers few ideal settings for boating facilities, accesses, and mooring fields to relieve the conditions of the Inner Bay and the Narrows. The waters along the southern shore of the Outer Bay are quite shallow, and vehicular access to the shoreline would often require passing through narrow residential streets. Thayers Beach, presently privately owned, offers a popular beach easily accessible to motorboats, but access from land may require crossing an extensive wetland. The northern shores of both Inner and Outer Bay tend to be steep and/or rocky, offering beautiful overlooks but limited potentials for vehicular and boat ramp access. The northern shores of both bays are more sparsely developed, but vehicular access to the shoreline would require passage along long, winding dirt roads.

Economic Constraints Limiting Recreation Use

Economic carrying capacity is a level of activity beyond which there is an unacceptable economic impact on other resources, such as commercial fisheries, or drinking water supplies. The predominant use of Malletts Bay is water-based recreation. The resources of the Bay are also utilized for limited commercial fishing and as a drinking water supply for some residents. At this point, there are no recognizable correlations between intensity of recreation use and economic impact on other resources. As the Management Plan is finalized, an economic analysis of the recommendations will be conducted to determine associated costs and benefits of management strategies. It is unlikely that economic constraints will be the limiting factor on recreation use of Malletts Bay.

Ecological Constraints Limiting Recreation Use

In the recreation field, **ecological carrying capacity** refers to levels of use beyond which there are unacceptable impacts on natural resources (Pigram, 1983). A few studies have shown an increase in lake nutrient levels as a result of recreational activities. Mixing by outboard motor can increase nutrient exchange while wakes can cause shore erosion in narrow channels and on steep banks. Two stroke outboard motors release a variety of contaminant engine exhaust, while older motors discharge an average of 10-20% of fuels through crankcase drainage into lake waters (U.S. Army Corps of Engineers, 1989). Perhaps most critical is the effectiveness of regulations prohibiting the disposal of sanitary wastes into lakes by boaters. Despite the extent of studies concerning environmental impacts of recreational activities, few studies have correlated intensity or density of users to environmental impacts. According to the Army Corps of Engineers' report (1989), the determination of ecological carrying capacity remains a subjective decision.

The extent of recreation facilities and activities in East Spaulding Bay and east of Coates Island area is undoubtedly impacting the water quality due to fuel spills, outboard motor exhaust and drainage, bottom sediment mixing, and accidental and intentional emptying of sanitary holding tanks. More research would be needed correlating intensity on recreation use and ecological impacts to determine whether specific thresholds could be utilized for limiting factors. Also, a concern is the impact of water quality on recreation use. The current lack of a sewer system is a concern expressed by many key informants and previous studies. In a 1986 a random survey conducted by the Bay Shore Committee, 92% of respondents cited water quality of Malletts Bay as their primary concern. The ongoing water quality monitoring effort tests for fecal coliform at 13 sites in the Inner Bay. The tests have identified several "hot spots" of likely failed septic systems. The average percentage of exceedances above the health standards for fecal coliform at the test sites was 35.4%. This is up from 23.6% in 1992 and 15.3% in 1991. The samples from two sites at Smith Hollow Stream exceeded the standard 75% and 90% of the time; while 70% of the Fish and Wildlife Access Area and 65% of Crooked Creek samples exceeded the standard. Comparing the 1993 results with the previous two indicates that bacterial contamination is widespread and generally increasing.

Social Constraints Limiting Recreation Use

The social carrying capacity is concerned with the level of use beyond which there is unacceptable impact on the quality of the recreational experience. Shelby and Heberlein (1986) have proposed that when two-thirds of users perceived crowding, the social carrying capacity is exceeded. Another parameter to consider is the number of users reporting conflicts with other recreationists and the nature of the conflicts.

According to the Army Corps of Engineers' 1989 report, *Recreational Carrying Capacity and Application to Lake Management*, the social parameters are the most limiting factors.

"Although in some recreational settings physical, economic, or ecological constraints may limit recreational opportunities, social carrying capacity is likely to be the limiting factor in most instances (Shelby and Heberlein, 1986). In situations where social or ecological carrying capacity is exceeded, the manipulation of physical carrying capacity by limiting the availability of support facilities (i.e., parking lot spaces), can be a useful management technique for meeting carrying capacity guidelines."

Indeed, the survey results showing 62% of respondents expressing perceived crowding signifies a problem and limiting factor for recreation use of Malletts Bay. However, the issue of perceived crowding should not be viewed in isolation. Recognition is needed of boating patterns and specific locations of perceived crowding and boating conflicts. When asked to map the areas where crowding was perceived, the respondents identified the central area of the Inner Bay, East Spaulding Bay, and the Narrows. The survey shows that 20% of respondents reported conflicts on their boating trips. The nature of the conflicts, and use patterns along the perceived crowding also identified the trouble areas as the central area of the Inner Bay and the Narrows. Given that 75% of respondents started their trips in the Inner Bay and over half of the respondents spent the most time in areas outside of the Inner Bay, it is not surprising that respondents perceived crowding and experienced conflicts in these areas.

The management implication combining perceived crowding, conflicts, and the description of the nature of conflicts, where trips begin, and where most time is spent would seem to indicate not that there are too many boats in Malletts Bay, but a combination of the following:

- Too many boaters are starting their trips in the Inner Bay and being required to pass through the Narrows to the Outer Bay.
- Too many boaters are either not aware or are not respectful of the "rules of the road," compounding the perception of crowding. Of particular concern is: the distance of motorboats passing by other boaters of all types, speeding, noise, and responsibility for your wake.
- Too many boaters of conflicting uses are utilizing the same surface area of the Inner Bay, at the same time (with a secondary concern that the current layout of moorings is reducing the usable surface area of the Inner Bay).

The implications for management should go beyond simply freezing in time the number of boats and activity, but should address the pattern of activity, seeking to disperse access and use to take better advantage of the Outer Bay and reduce the conflicts and perceived crowding in the Inner Bay.

Monitoring of the Bay through use counts and surveys should become an ongoing, annual effort. After at least two more summers of data collection, it should be determined if there is a strong correlation between average peak hour usage and perceived crowding. If yes, then it would be possible to determine a limit to the number of boats. This is discussed in further detail in Chapter Four: Policy Formation under Marinas, Moorings, Docks, and Anchorages.

Chapter Four: Policy Formation

Introduction to the Policy Formation

The process of developing a recreation management plan for Malletts Plan is based in part upon the Visitor Impact Management planning framework as outlined in the *Vermont Lakes and Ponds Recreation Management Plan*, by Zwick Associates Inc. et. al., 1990. The focus of Visitor Impact Management is to identify unacceptable or problem conditions, determine potential causal factors, and select potential management strategies to ameliorate the unacceptable impacts or conditions.

Much of the recent literature on recreation management suggests that attempts to establish and define recreational carrying capacity has questionable validity (Graefe, Kuss and Vaske, *Visitor Impact Management*, National Parks and Conservation Association, 1990). It has been suggested that, in many cases, establishing use limits and carrying capacities may do little to address the unacceptable conditions they were intended to solve. Within the context of the Visitor Impact Management framework we explore recreational carrying capacity, not as a fixed number, but as a correlation of social perceptions and physical constraints, to determine unacceptable impacts.

Specific conditions and issues to be addressed by the Malletts Bay Recreation Management Plan were identified through the Critical Analysis process, which included a review of the natural and built resources, levels of jurisdiction, review of relevant studies, survey of users, use counts, interview with key informants, and a recreation use analysis. The most critical issues to be addressed are as follows:

- **Boating Conflicts and Safety Concerns**
- **Perceived Crowding**
- **Public Access**
- **Cultural Heritage Resources and Tourism and Hospitality Facilities**
- **Water Quality and Aquatic Nuisances**
- **Fish, Wildlife, and Wetlands**
- **Moorings, Docks, and Anchorages**

Each of these issues is addressed in this section of Policy Formation through the following steps:

- **Issue Description:** summarizing the existing condition and probable causes of impacts or condition.
- **Management Goal:** a statement of the desired visitor experience and/or resource management goal.
- **Key Indicator Standards:** when applicable, a measurable standard is identified as a target goal or acceptable condition relative to the issue.
- **Monitoring:** when applicable, identifying a process for measuring existing conditions to be compared with the Key Indicator Standard.
- **Management Objectives:** defining the management goal into specific objectives that can be addressed by management strategies.
- **Management Strategies:** a full range of direct and indirect management strategies to deal with the probable causes of impacts or conditions. The order of preference in Management Strategies is: first education, then increased enforcement, and finally, increased regulation.

The final section presents the **Implementation of the Recreation Management Plan**. The first step is the reestablishment of the **Malletts Bay Harbor Commission** to coordinate the implementation of the Recreation Management Plan. The second step is the identification of **Water Management Zones** which integrates the locational management strategies recommended in the Plan.

The overall intent of the Water Management Zones is to identify appropriate locations and limits for recreation facilities, which in large part determine recreation patterns and impacts on the recreation experience and the natural resources. The focus is placed on controlling facility locations and densities

rather than attempting to regulate use. The identification and policies of the Water Management Zones must be closely coordinated with the Shoreland Zoning and Town Master Plan.

Each Water Management Zone is addressed by:

- **Purpose:** identifying the objective of the zone.
- **Appropriate Uses:** specifying what recreational uses are likely to occur in the zone.
- **Location:** describes the proposed zone location in Malletts Bay.
- **Policies:** suggests specific management strategies and facilities which should be implemented in the zone.

Issues, Objectives, and Management Strategies

Boating Conflicts and Safety Concerns

Issue Description

Approximately 20% of survey respondents reported having a conflict or a problem with other users of Malletts Bay. The most prevalent conflict reported was in regard to boating courtesy and obeying the "rules of the road": motorboats passing too closely to other boats, swimmers, and shoreline, speeding, and the resulting wakes and noise. Of interest is the fact that motorboaters were the group most likely to complain of conflicts with other motorboaters.

According to the Vermont State Police, the number one violation is speeding over 5 mph within 200 feet of the shoreline, a person swimming, a canoe, a rowboat, or anchored boat with passengers or a swimming area. As Malletts Bay is visited by citizens of New York and Quebec among other areas who have different, often less strict regulations than Vermont, the lack of consistency in regulations compounds the safety and enforcement issues.

Problems with personal watercraft (including jetskis) were reported 24 times out of a total of 75 open-ended comments responses in the survey as the source of conflict. Concerns were expressed by all types of boating groups and shoreline residents. Specific concerns include dangerous maneuvers, "harassing" other boaters, speeding, jumping wakes, and many comments regarding noise. Complaints of conflicts with personal watercraft were reported to occur throughout the Inner Bay and at Thayers Beach.

Survey respondents were asked to identify where the conflicts occurred. The greatest number of conflicts (34%) were reported to occur in the Narrows between the Inner and Outer Bays with concerns of motorboats passing too closely, speeds, large wakes and personal watercrafts "harassing" canoers/kayakers. The central area of Inner Bay accounted for 17% of the conflicts, with reports of motorboat speeds and lack of courtesy, and several complaints of personal watercrafts. There were a few complaints about water skiers passing too closely to fishing boats and swimmers, and a sailboat passing too closely to an anchored fishing boat. One sailor complained of fishing boats anchored in the Cut. This was a concern voiced by other sailors in the key informant interviews. While a few anglers in public meetings complained of sailboats aiming right for their anchored boats requiring them to pull up their anchor and move.

If the amount of use was allowed to increase without the implementation of management strategies we would expect a compounding of existing conflicts and safety concerns particularly for the high use areas: the Narrows, East Spaulding Bay, East of Coates Island, and the central area of the Inner Bay.

Management Goal

Minimize conflicts among recreationists and maintain the highest degree of safety among bay users.

Key Indicator Standard

Achieve a level of 15% or less of survey respondents reporting a conflict or problem with other users of Malletts Bay. (Twenty percent [20%] of respondents in the 1994 survey reported boating conflicts.)

Monitoring

Develop a standardized survey and use count methodology to be administered every year. Include questions of boating conflicts; identifying nature and location of conflicts.

Management Objectives

1. Develop and enhance public education on boating safety and courtesy that specifically addresses the issues of greatest concern.
2. Provide management strategies that specifically address locations where most conflicts are reported to occur: the Narrows and the central area of the Inner Bay.
3. Improve consistency and coordination of enforcement.
4. Separate conflicting uses by space and/or time when possible.
5. Increase regulation as a last resort.

Management Strategies

1. **Public Education: Boating Rules and Courtesy**
 - a. Post public education posters of simplified boating rules and courtesy with graphics at all public access sites, including Malletts Bay, Windemere Way, Heinenberg, and Lamoille River Accesses, and all marinas, highlighting:
 - "Keep your Distance," 200' distance requirement from other boats, persons in water, and shoreline, except at a speed less than five miles per hour which does not create a wake.
 - "Boaters are responsible for their wake."
 - "Do not jump wakes."
 - b. Prepare handouts of the simplified "boating rules and courtesy" with graphics as discussed in a. above and
 - Distribute to each person registering for a mooring or dock space in Malletts Bay.
 - Provide a supply to marina owners and public access attendant for handing out at the fuel pumps, targeting transient users.
 - c. "Advertise" "boating rules and courtesy" on every issue of the Colchester Chronicle from April through September using the same education poster as in a. above.
 - d. "Advertise" "boating rules and courtesy" on the weather station and the Vermont ETV station.
 - e. Harbormaster to do a presentation on safe boating and courtesy to the 6th grade class in April every year, providing students with the same handout to take home and give to their parents.
 - f. **Public Education: Social Events**

The Town could sponsor and/or encourage recreation groups, or marinas, to sponsor annual social events where participants of different recreation activities can meet each other and discuss their concerns and ideas in a social setting.

 - Fish fry by the anglers.
 - Beach clean-up.
 - Boating skills demonstration - boaters from each type, or focusing on a particular boat type.
 - Marina Day where the Marinas have open house with events.
 - g. **Public Education: Empowering Citizens to Speak Up**
 - 1) Create a Malletts Bay Watch Program providing a means for citizens to report (through the mail or phone) boat numbers, date, location, and the offense to the Harbormaster or other appropriate agency who mails a standard form with a "friendly reminder" of boating rules and courtesy.
 - 2) Encourage direct communications between citizens. Most people will listen and do the right thing if approached respectfully. The Harbormaster or state police could provide messages on "how to effectively communicate your concerns" to shoreline residents, marina owners, boating associations, and all persons registering for moorings.

- 3) Encourage/sponsor a letter-writing campaign to manufacturers of personal watercraft to improve muffling systems, requesting information on current decibel levels and proposed changes.

Responsibility for Public Education: Malletts Bay Harbor Commission oversee, coordinate with and utilize materials from the State Police, Harbormaster, U.S. Fish and Wildlife Service, marinas, and recreation groups.

2. **Conflict Hot Spots:** The Narrows and the Central Area of the Inner Bay

- a. **The Narrows**

There was much discussion in the public meetings and key informant interviews regarding the best way to reduce conflicts in the Narrows. In general, many motorboaters favor the placement of navigational buoys while sailboaters feel the unpredictable winds through the Narrows would make it impossible to tack through on the correct side. Perhaps the best way to find out is a well publicized three week temporary installation of navigational buoys by the U.S. Coast Guard with public meetings held in advance, while the "devices are in place," and after removal. Traffic flow would be monitored before, during, and after the devices are in place and removed to note problems and improvements, if any. If the public response and monitoring prove the buoys are effective, consider permanent installation.

Responsibility: Malletts Bay Harbor Commission initiate efforts, U.S. Coast Guard, Department of Public Safety, and Harbormaster to implement and monitor.

- b. **The Central Area of the Inner Bay**

The central area of the Inner Bay is utilized for a wide diversity of boating activities as well as a navigational route from the marinas, moorings, shoreline residents, and the public access. A combination of management strategies of dispersing access (see Public Access) public education (see 1. above) and separating uses by time and space when necessary (see 4 below) are proposed to address the conflict and safety concerns of the central area of the Inner Bay.

3. **Enforcement**

The U.S. Coast Guard has initiated a number of meetings with the enforcement entities on Lake Champlain to explore safety issues and identify ways to make enforcement and differences in regulations more consistent as suggested in the Lake Champlain Recreation Assessment Report. The U.S. Coast Guard, State Police, and Harbormaster maintain a presence in Malletts Bay particularly on busy weekends as noted by key informants and public meeting attendees. Those commenting feel the level of presence is good.

Responsibility: U.S. Coast Guard, State Police, and Harbormaster.

4. **Separating Conflicting Uses by Space or Time**

- a. The 200' distance requirement is an existing regulation for separating by space.

- b. An area for water skiing has already been designated along the southwest shore of Malletts Bay including a slalom course to the west of Thayers Beach and a waiver for campers of Brown Ledge to water ski within 200' of the shore. A resident of Niquette Bay area suggests there should be a beginner and/or intermediate water skiing area identified. According to a key informant and a member of the steering committee this has helped reduce the number of complaints of conflicts with water skiers. Very few complaints of water skiing were reported in the survey.

- c. The greatest number of conflicts were reported by motor boaters regarding other motorboaters. It would not be possible to separate these boaters from themselves.

- d. The second highest category of conflict reports were regarding personal watercraft. According to a personal watercraft enthusiast, most people do not understand that personal watercraft are designed to perform "stunts" such as dipping in and out of the water and turning in tight radii. However, this apparent "erratic" behavior is disconcerting, if not dangerous to other boaters in high traffic areas. It may be appropriate to identify an area for personal watercraft "stunt riding" that is a low traffic area away from shoreline residents. An area 200' out from the causeway, north of the bridge would be an appropriate location as it is already popular for personal watercraft, is a low traffic area, and the predominant southwest winds would carry the noise farthest from shoreline residents. (See the Water Management Zones).

Responsibility: The Water Resource Board has authority to identify the area; U.S. Coast Guard, State Police and Harbormaster have authority to enforce.

- e. The Cut should function primarily as a navigation route. The following activities are prohibited in the Cut:
- Anchoring
 - Trolling or fishing of any kind
 - Water skiing
- This information should be posted at all public and private access points in and near Malletts Bay and appear in the State boating regulations, and should be more clearly marked at the Cut. Enforcement should be increased at the Cut.
- Responsibility:** U.S. Coast Guard, Vermont Water Resources Board, Department of Public Safety, and the Harbormaster.

Perceived Crowding

Issue Description

Survey respondents were asked to rate their perceptions of crowding using a crowding scale that was fashioned after a model suggested in the Vermont Lakes and Ponds Recreation Management Study. This study suggests that two of the nine scale points indicate an uncrowded situation while the remaining 7 indicate some degree of crowding. Using this as a benchmark, the Malletts Bay survey data indicate that 62% of users perceived crowding on Malletts Bay. Seventeen percent (17%) experienced a severe degree of crowding, while 38% of users experienced no crowding. According to The Lakes and Ponds Recreation Management Study (Zwick Associates et. al., 1990):

"When over 65% of the visitors feel crowded, there is a definite problem. At this stage, managers and interests groups may wish to take action to reduce use levels without waiting for the time and funds necessary for a complete carrying capacity study. If visitor impacts are an important part of the experience, it makes sense to freeze use levels immediately when crowding reaches 65% of greater."

According to the 65% benchmark, this response of 62% of respondents reporting perceived crowding signifies a problem. However, it must be stated that the survey results are from only six data collection days and are a compilation of essentially three separate surveys conducted in different manners for shoreline residents, marina users, and those using the public access. Therefore the 62% rate could be contested and "freezing the use level" may not be justified. The actual locations with high levels of perceived crowding has more direct relevancy for managing recreation use. Respondents were also asked to identify the area where they perceived crowding. The central area of the Inner Bay, East Spaulding Bay and the Narrows each were reported by nearly a quarter of the respondents as crowded. A relatively high percentage of respondents (11%) perceived crowding along Thayers Beach.

Correlating perceptions of crowding with estimated peak boat usage identified a general trend suggesting higher perceptions of crowding with heavier peak usage, however, the data is not ample enough to draw solid conclusions. The relatively weak association between perceptions of crowding and estimated peak boat use may suggest management strategies should not only address the number of boats in use, but also the boating patterns and behavior.

The issue of perceived crowding should not be viewed in isolation. The management implications combining perceived crowding, conflicts, and the description of the nature of conflicts, where trips begin, and where the most time is spent would seem to indicate not that there are too many boats in Malletts Bay, but a combination of the following factors:

- Too many boaters are starting their trip in the Inner Bay and being required to pass through the Narrows to the Outer Bay.
- Too many boaters are either not aware or not respectful of the "rules of the road," compounding the perception of crowding.

- Too many boaters are utilizing the same surface area of the Inner Bay at the same time, with a secondary concern that the current layout of moorings is reducing the usable surface of the Inner Bay.

The implications are that strategies for management should go beyond simply freezing in time the number of boats and activity, but should address the patterns of activity, seeking to disperse access and use to take better advantage of the Outer Bay and reduce the conflicts and perceived crowding in the Inner Bay and the Narrows. Many other Management Strategies under the headings of Boating Conflicts and Public Access, as well as under this section, should be implemented and monitored for effectiveness before imposing restrictions on the number of boats utilizing Malletts Bay.

If continued monitoring of use counts and perceived crowding identifies a strong correlation between the two, it may be justified to determine limits on the numbers of boat berths, both commercial and private. This is addressed in further detail in the section of Marinas, Moorings, Docks, and Anchorages.

Management Goal

Ensure high quality recreation experience, maintaining a diversity of uses including high speed motorized recreation compatible with low speed recreation where all types of water craft are in evidence limited only by safety considerations, perceived crowding, and minimized impacts on the natural resources.

Key Indicator Standards

Reduce and maintain a level of 60% or less survey respondents reporting perceived crowding.

Monitoring

Develop a standardized survey and use count methodology to be administered every year. Include questions regarding perceived crowding using the standard nine-point scale and identification of locations of perceived crowding.

Management Objectives

1. Develop, enhance, and maintain public education on methods to reduce perceived crowding in Malletts Bay.
2. Provide management strategies that specifically address locations where perceived crowding is the highest: the central area of the Inner Bay, the Narrows, and East Spaulding Bay.
3. Develop a method to correlate perceived crowding and use counts. If there is a strong correlation, restrict boat numbers in areas contributing to perceived crowding, but only after implementing and monitoring the effectiveness management strategies addressing boating behavior.

Management Strategies

1. **Public Education: Crowded Locations and Times**
 - a. Post public education posters at all access points and marinas and distribute to all persons registering for mooring space alerting boaters of the busiest use times of Saturdays and Sundays from 11 am. to 3:30 pm., suggesting they will find much quieter waters if they avoid these times.
 - b. Include the schedule of sailing races, fishing derby's, and other special events in the public education posts. Advertise these events in the Colchester Chronicle and weather station.
 - c. Provide information on less crowded areas, i.e., Colchester Pond, Arrowhead Reservoir, Windemere Way Access, Lamoille River Access, and Heinenberg Access.

- d. On public education notices suggest avoiding anchoring, fishing, or water skiing in the Narrows on busy weekends. The Harbormaster to encourage persons to relocate for their own safety.
Responsibility: Malletts Bay Harbor Commission to oversee, coordinate with, and utilize materials from recreation groups, State Police, Harbormaster, and the U.S. Fish and Wildlife Service.
2. Strategies to reduce boating conflicts that compound perceived crowding are addressed under Boating Conflicts.
3. Methods to disperse boating access, therefore, changing traffic patterns and crowding at the access points is addressed under Public Access.
4. Strategies to limit the amount of surface area devoted to moorings is addressed in Moorings, Docks, and Anchorages.
5. Methods to limit the number of boats and manage the pattern of use is addressed in the sections on Public Access, Marinas, Moorings, Docks, Anchorages, and Water Management Zones.
6. Explore the potential of dredging the Sand Bar to encourage boat traffic to the north. Note: in 1980, the Army Corps of Engineers conducted a cost/benefit analysis of dredging the Cut and determined that it was not economically justifiable; similar findings for dredging the Sand Bar are expected, but it is worth determining based on current information.
Responsibility: Malletts Bay Harbor Commission to initiate effort. U.S. Army Corps to conduct cost/benefit analysis if warranted.

Public Access

Issue Description

Inadequate public access to the waters of Malletts Bay, including access for small motorized boats, non-motorized boats, pedestrian, swimming, shoreline fishing, and bay viewing, is a concern that was voiced several times through this planning effort and is echoed repeatedly in many previous studies. Ideally, an access for small motorized boats would be developed in the Outer Bay to relieve pressure on the Malletts Bay Fish and Wildlife Access Area and in the Narrows, and car top launch accesses for non-motorized craft would be located along the northern shore of the Inner Bay near Malletts Creek and the Malletts Bay State Park. According to the survey results, only 30% of respondents were from Colchester, suggesting boaters are traveling to Malletts Bay as a destination. Increased education on the regional access location may help relieve the pressure on Malletts Bay. It is expected the new small boat access at the Burlington U.S. Coast Guard station should help.

As expressed by a key informant increased public access is needed:

- to the water from the shore,
- to the shore from the water, and
- to the shoreline from inland.

Public Access to the Water from the Shore is Limited to:

The Malletts Bay Fish and Wildlife Access Area is the only free public boating facility providing direct access to Malletts Bay, and is limited to 184 parking spaces. According to Joe Healy at the Waterbury Fish and Wildlife office, no additional Fish and Wildlife Access Areas 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. Existing Fish and Wildlife Access Areas and private marinas 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.
 - Marinas and Associations: Champlain Club Ltd., Malletts Bay Boat Club, Marble Island Resort and Marina, Coates Island Marina, Malletts Bay Marina, and the Moorings.

- Gravel launch ramp for small boats:
 - Sand Bar State Park.
- Car top launching:
 - Heinenberg on the Winooski River.

Public Access to the Shore from the Waters is Limited to:

- No public docking space.
- Most marinas provide some dock space for transient tie-up, some charge a nominal fee. Some allow overnight docking for a fee. Space is limited.
- Facilities, once on shore, are very limited.

Public Access from Inland to the Shoreline for Viewing, Fishing, and Swimming is Limited to:

- Bayside Park - experiences extensive use by the Town Recreation programs, but limited public use.
- Causeway - with limited accessibility, and no parking. The Town of Colchester has developed plans for a **recreation path** starting at Airport Park, through the Colchester Bay and extending out the Causeway Park. For now the plans stop at the "Cut" awaiting resolution of a "ferry" system to make the crossing.
- Malletts Bay State Park, a 290-acre parcel on the north shore of the Inner Bay, is planned to include a Nature/Interpretive Center, pedestrian trail, small group picnic shelter, and family picnicking. Camping, swimming, and boat launching facilities were considered inappropriate uses.
- Marble Island Resort has plans for a fishing pier as part of their expansion.

Winter Access to the Ice is Limited to:

- Malletts Bay Fish and Wildlife Access Area (however ice ridges through the Narrows generally prohibit travel to the Outer Bay from the Inner Bay.
- Ice fishing vehicle access across private property by "handshake agreement" off Porter's Point in the Outer Bay and Niquette Bay in the Inner Bay.

According to the survey results, over three quarters of boaters start their trips in the Inner Bay, while over half the boaters spend most of their time in the Outer Bay. Not surprisingly, the greatest number of conflicts (34%) were reported to occur in the Narrows between the Inner and Outer Bays. If boating access were increased in the Inner Bay without the implementation of management strategies, a compounding of existing conflicts and perceived crowding particularly for the high use areas of the Inner Bay would be expected, including: East Spaulding Bay, the central area of the Inner Bay, and the Narrows. Additional parking spaces or the development of a new ramp at the Malletts Bay Fish and Wildlife Access Area would have the most direct impact on increasing peak use level and conflicts.

Management Goal

Provide adequate public access for a diversity of water and shoreline uses identifying locations with suitable lake and shoreline conditions and where facilities will improve use patterns, decrease boating conflicts, and perceived crowding.

Monitoring

Questions regarding user satisfaction with access and facilities locations should be included in the user surveys to be administered annually.

Management Objectives

1. Reduce pressure on the Malletts Bay Fish and Wildlife Access Area.

2. Reduce the amount of boating conflicts and perceived crowding in the Narrows by providing additional public access to the water from the shore for small boats in the Outer Bay and non-motorized boats on the north shore of the Inner Bay.
3. Enhance the existing, and provide additional public access to the shore from the water, particularly addressing the transient boaters seeking short-term anchorage or berths, and connections to the shoreline.
4. Enhance the existing, and provide additional public access to the shore from inland, particularly for pedestrians, bicyclist, swimming, shoreline fishing, and bay viewing.

Management Strategies

1. **Public boat access to the water from the shore.**
 - a. **Do not increase the capacity of the Malletts Bay Fish and Wildlife Access Area** through additional ramps or increased parking space until, if ever, the level of boating conflicts and perceived crowding has dropped below the key indicator standards, particularly in East Spaulding Bay and the Narrows.
 - b. Since 1991, the Malletts Bay Fish and Wildlife Access Area has been improved with the construction of a dock, dredging, and the addition of an attendant. However, many key informants, attendees of public meetings, and survey respondents voiced the need for **further improvements** including restrooms, washdown area for control of aquatic nuisances, parking clarification, and the attendants to take more control in directing the launching and hauling of boats. Improving the functioning of the access would likely reduce the boating conflicts and perceived crowding on the Bay. However, some Steering Committee member expressed concern that the improvements or a washdown area and restrooms could reduce efficiency of the access.
 - c. **Install directional signage for all public access points** in and around Malletts Bay including:
 - Malletts Bay Fish and Wildlife Access Area.
 - Lamoille River Fish and Wildlife Access Area.
 - Heinenberg Access Area.
 - Windemere Way Access Area.
 - Sand Bar State Park Access Area.
 - Any new access area developed.
 - d. **Post maps with location, capacity, and boat sizes accommodated of all regional access points at each public access point**, including other accesses to Lake Champlain in Colchester, Burlington, Shelburne, and the Islands, as well as other water bodies. Include maps with the boat registration at the town offices and at private businesses with public bulletin boards.
 - e. **Develop a new boat access with a paved ramp suitable for boats 21' in length or less in the Outer Bay** to reduce pressure on the Malletts Bay Fish and Wildlife Access Area and to improve the level of boating conflicts and perceived crowding in the Narrows and the central area of the Inner Bay. Potential locations to be further researched include:
 - 1) **At the southern end of the Causeway.**
 - + Property is owned by the Town.
 - + Located near preferred fishing sites.
 - + Boat access site could also provide parking for shoreline fishing off the Causeway.
 - + Access could also serve as a winter access.
 - Will require road improvements.
 - Will require developing a parking lot, adequate space?
 - May conflict with the bike path.
 - ± Shallow water depths will limit boat size.

- 2) **Thayers Beach** (Rosetti property)
 - + Site could be multi-purpose providing shoreline access to a popular swimming area presently accessible only by water, and shoreline fishing if a dock and/or fishing pier were built, and small boat access.
 - + Access would also serve as a winter access.
 - Property is privately owned, and development plans are currently being reviewed by the town. The Colchester Land Trust has been looking into the feasibility of acquiring Thayers Beach for a park, beach, and access site.
 - Extensive wetlands may limit parking and road access.
 - Water depths are very shallow, may require extensive dredging, even for access for boats less than 21' in length.
- f. **Develop a car top launch access for non-motorized boats, canoes, kayaks, and sailboards along the northern shore of the Inner Bay** to relieve pressure on the Malletts Bay Fish and Wildlife Access Area and to provide a short paddling distance to Malletts Creek. Possible locations for car top launch access sites to be researched further include:
 - 1) **Malletts Bay State Park**
 - + Provides non-motorized access to the north shore of Inner Bay offering some protection from wind and waves and within a short paddle distance to Malletts Creek.
 - Steep slopes may prohibit developing the access may require negotiating purchase or easement with neighboring property.
 - Current plans for the State Park do not include an access site.
 - 2) **Nurses Corner**
 - + Property is currently on the market. Existing building is currently vacant.
 - + Provide non-motorized access near Malletts Creek and the north shore of the Inner Bay.
 - ± Good road access, but sight distance is limited.
 - Limited space for parking.

Responsibility: (1a. - f.) Malletts Bay Harbor Commission to coordinate effort working with the Vermont Department of Fish and Wildlife and the Colchester Recreation Board to establish new accesses. May want to incorporate the existing Access Committee as a sub-committee to focus on access development. Will require review by U.S. Army Corps of Engineers, VT DEC, VT DFPR, and VT Fish and Wildlife.

- g. **Encourage public use of commercial lakeshore properties** by providing incentives to private land owners. However, do not increase public boat launch access to the south shore of Inner Bay until boating conflicts and perceived crowding have been reduced below the key indicator standards. See section on Marinas, Moorings, Docks and Anchorages.

Responsibility: Include in Phase II of Malletts Bay Recreation Management Plan.

2. **Public access to the shore from the water.**
 - a. **Develop public dock, public restrooms, and pedestrian access** to stores, restaurants, and shoreline activities associated with a public anchorage area somewhere in the area east of Coates Island to Bayside Park.
 - 1) Town purchase property, or
 - 2) Public/private partnership between town and a marina or other private concessionaire, or
 - 3) Commercial properties providing public services.
 - b. **Public dock at the proposed Malletts Bay State Park as a destination**, with pedestrian access to the Nature Interpretive Center and beach facilities for picnicking and swimming.
 - c. **Bayside Park could include a public dock for dingy tie-up** with minimal improvements. Need to maintain a safe distance from swimming area.
 - d. **Encourage commercial lakeshore properties to provide public access to the shore from the water** through incentives.

Responsibility: (2a. - d.) Malletts Bay Harbor Commission, Access Committee, Planning Commission, working with approvals from U.S. Army Corps of Engineers, VT DEC, and VT DFPR.

3. **Public access to the shore from inland:** swimming, shoreline fishing, and viewing.
 - a. **Thayers Beach**, if acquired by the town, could provide for an extensive beach with shallow area for swimming and viewing.
 - b. **Bayside Park** currently receives relatively little general public use. The fee and entry booth are considered a deterrent for casual public use. A feasibility study should be conducted to determine the potential of developing a small parking area on the bay side of the road, winter access drive, and another dock or pier for shoreline fishing (away from the swimming area).
 - c. Parking at the southern end of the Causeway would improve accessibility for fishing off the Causeway.
 - d. A boardwalk, fishing pier, and public viewing area in the area between Coates Island and Bayside Park and would be the most accessible and coordinate with the Lakeshore Redevelopment plans (see Cultural Heritage Resources and Tourism and Hospitality Facilities).
 - e. A fishing pier is included in the expansion plans for Marble Island. Due to the recent extensive fire at Marble Island the schedule for expansion is in question.
 - f. Gather community support through town official support and grass root efforts of petitions, letter writing, or phone calling to Agency of Natural Resources and State Legislators to **implement the plans for the Malletts Bay State Park**, with the potential additions of a dock and car top launch access, as a regional resource providing public access to the shores of Malletts Bay.
 - g. Encourage commercial lakeshore properties to provide public access to the shore through incentives.

Responsibility: Malletts Bay Harbor Commission to initiate efforts working with the Lakeshore Redevelopment Committee and Planning Commission, and Agency of Natural Resources. Permits for encroachments required from U.S. Army Corps of Engineers, VT DEC.

4. Develop a **Harbor Improvement Plan** as part of Phase Two of the Recreation Management Plan as suggested in the request for proposal to address public access.

Responsibility: Malletts Bay Harbor Commission working with consultants.

Cultural Heritage Resources and Tourism and Hospitality Facilities

Issue Description

Malletts Bay is a high use bay of Lake Champlain offering a scenic setting with protected waters. Relative to the high use level there are surprisingly few services and facilities, public and private docks, walkways, beaches, restaurants, overnight lodging, and shops.

Many key informants and public workshop attendees commented on how the Malletts Bay area "isn't what is used to be." In it's heyday of 1950's and 60's there were many active restaurants, hotels and cottages, with lots of daytime activities and several options for night life.

The Lakeshore Redevelopment Committee was recently formed to address the question of how to improve the Lakeshore Drive area to bring the quality of the recreational and tourism facilities up to the level of the scenic setting of Malletts Bay. The following is the Vision Statement from the Lakeshore Redevelopment Committee:

The Village on Malletts Bay

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 village style and a possible "Baywalk" along a new retaining wall in the Bay. Bike paths extending

from Exit 16 (through "Camp Johnson") and the business district, through Colchester Bog, Sand Plain and Winooski River, will connect Colchester to Burlington's bike path. Sidewalks, increased entertainment, artistic and recreational activities are integral to the plan.

Key to this vision are:

- Predetermined 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 Malletts Bay and Lakeshore Drive areas.
- Reconstruction of Lakeshore Drive, including a retaining wall with "Baywalk."
- A commitment to sidewalks, bike paths, access, and cooperation.
- Management: The Town of Colchester will manage the project with the help of a citizen advisory committee.
- Other: This effort will complement the combined Federal, State, and Local initiative for a Recreation Management Plan for the waters of Malletts Bay. The Town of Colchester is currently rewriting its Master Plan.

The Malletts Bay area also offers many points of historic interest which are relatively unpublicized. The area holds two historic sites listed in the Vermont Historic Site and Structures, including the Woehr House on Lakeshore Drive and Braeloch Camp on the north shore of the Inner Bay, and certainly has many more, though no comprehensive survey of standing structures in the Malletts Bay vicinity has been conducted. The many existing historic buildings and structures (many of them "camps") that exist along the Bay could be the focus of exciting tourism initiatives once the resources have been fully inventoried and interpreted. The Vermont Department of Historical Preservation (DHP) has identified 30 prehistoric sites within the study area and believes there are many others.

Nearly the entire shoreline of the bay is considered very likely to contain evidence of prehistoric occupation. Two aquatic areas are identified as having archaeological sensitivity: off Red Rock Point and the bay on the north shore of the Inner Bay just west of the State Park land where a wreck, the wooden schooner, Marion, is located. The underwater historic preserve the "Phoenix" is located just outside the Causeway of Malletts Bay.

A member of VAST (Vermont Association of Snow Travelers) feels the town is "missing a great opportunity" to promote the winter economy by catering to the large number of ice anglers and snowmobilers, by holding winter festivals.

Efforts underway to enhance tourism in Lake Champlain include:

Recreation planners from New York and Vermont and the U. S. National Park Service, along with many active citizens, private organizations 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.

The Sand Bar Wildlife Refuge and State Park provides a natural area and park at the northern edge of the Outer Bay for nature enjoyment, picnicking, lake viewing, and small boat launch access.

The Malletts Bay State Park, when developed, is planned to include a Nature Interpretive Center, picnicking, and nature trails.

Management Goal

Develop recreation and tourism opportunities improving the local economy and complementing the scenic setting of the bay.

Management Objectives

1. Support and coordinate with the efforts of the Lakeshore Redevelopment Committee identifying areas for shoreline access, facilities, and pedestrian connections.
2. Promote the identification and designation of historic and cultural heritage resources for publicizing and protection.

Management Strategies

1. Concentrate much of the public shoreline facilities for bay viewing, strolling along the water's edge, and shoreline fishing in the area between Coates Island and Bayside Park to coordinate with the Lakeshore Redevelopment effort on encouraging a compact village business district. Also see the Water Management Zones.
2. Encourage marina owners to upgrade their facilities by increasing the options for improvement. (The revised Town Master Plan and work of the Lakeshore Redevelopment Committee in addressing zoning regulations, such as reducing front setback, should help.) Public use of commercial lakeshore properties should be encouraged through increased incentives.
3. Prepare a Malletts Bay brochure sponsored by commercial enterprises in the Bay area that identifies tourism opportunities: which marinas offer transient dockage space, pumpout facilities, fuel pumps, boat and watercraft rentals, sailing lessons, campgrounds, activities and historic and cultural resources in the area. Distribute and exchange brochures with Chambers of Commerce through out Lake Champlain in Vermont, New York, and Canada.
4. Schedule summer and winter bayside events and festivals: music, arts, crafts, boat tours, marina "open houses," boat shows and demonstrations, shoreline clean-ups, lake ecology workshops along with the existing sailing races and fishing derbies.
5. Work with the Lake Champlain Bikeways Committee to coordinate the bicycle route through the Malletts Bay area. Monitor the trial "ferry" crossing of the Winooski River for potential utilization at the "Cut."
6. Work with Lake Champlain Paddlers Trail Committee to be sure that facilities and highlights of Malletts Bay are included in their publications.
7. Identify key historic themes relating to Malletts Bay such as "Seasonal Tourism", Maritime History, and "Industry" (Malletts Bay had major 19th century industries such as brick manufacture and others), then inventory, evaluate, interpret, and develop walking tours of related historic buildings and structures.
8. Develop a detailed archeological sensitivity map for prehistoric Native American sites to guide planning efforts. Conduct archaeological surveys to identify prehistoric and historic archaeological sites along the lakeshore to encourage public awareness and protection.
9. Increase awareness of local heritage through the public schools. An existing public education resource includes: *Discovering the History and Heritage of the Champlain Basin* - a resource guide for educators who want to plan classroom instruction which focuses on the history and cultural heritage of the Champlain basin. Compiled by Gregory Sharrow and Amy Demerest, Spring, 1993.
10. Work with the Lake Champlain Basin Cultural Heritage Office to coordinate Heritage Tourism initiatives.

Responsibility: Malletts Bay Harbor Commission and Lakeshore Redevelopment Committee to divide and prioritize tasks. Work with Development Community.

Water Quality and Aquatic Nuisances

Issue Description

Water quality and the presence of aquatic nuisance species have a direct effect on the recreation experience. Many recreationists and residents are concerned with the safety of swimming, eating fish, their drinking water, the proliferation of weeds and algae, disruption to the aquatic ecosystem, and the potential of zebra mussels clogging their water intake pipes and fouling boat engines and hulls. In the open-ended comments of the user survey, 51 of a total 149 comments included concerns regarding water quality and aquatic nuisance plants.

Water Quality

The general water flow pattern of Lake Champlain is south to north. Malletts Bay, however, drains to the west through the narrow passageway in the Causeway, limiting water circulation. Malletts Bay does not experience the extent of thermal layering that is observed in the Broad Lake because of shallower depths, affecting the movement of pollutants and water temperature.

Phosphorous has generally been identified as the limiting nutrient for plant growth leading to accelerated eutrophication. Interestingly, Malletts Bay has one of the lowest phosphorous concentrations in Lake Champlain. However, arsenic and nickel levels are high, and heavy metals have been detected in sediments off Porters Point (Lake Champlain Management Conference, *Opportunities for Action*, 1994). In a conversation with a Key Informant there was a statement of theory that the arsenic binds up the phosphorous, leading to the low measurements of phosphorous in Malletts Bay.

Of greatest concern in Malletts Bay is the level of fecal coliform and E. coli bacteria. Water samples have been collected and screened for fecal bacteria since 1990 at select sites along the Inner Bay's shoreline. Trends in sampling results suggest that several locations within the Inner Bay regularly contain fecal coliform and E. coli bacteria at densities higher than those limits set by the Vermont State Health Department as safe for recreational waters (Cory Williams, *Malletts Bay Water Quality Inventory Report*, Summer - 1994). High water borne fecal coliform counts do occur in the areas of densely populated shoreline. 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.

The concern expressed most frequently in the open-ended comments of the survey regarding water quality was that boats are dumping their holding tanks in the waters of Malletts Bay. A few respondents expressed concern of sewage leaking from camp septic systems. At public meetings there were questions regarding where the inevitable wastes are deposited from the majority of boats under 21' without restroom facilities on board.

Aquatic Nuisance Species

The presence of aquatic nuisance plants ("weeds and algae") was the second most frequently expressed concern in the open-ended comments of the survey. Eurasian watermilfoil is present in Malletts Bay particularly at Malletts Creek, the Cut, the northeast area of Outer Bay, and by the Colchester Bay, but is not pervasive. Eurasian watermilfoil is spread by plant fragments. Hand pulling and installation of bottom barriers are the most common control techniques.

Zebra mussels are small freshwater mollusks that are transported on the hull of boats and as larvae in boat buckets, bilge water, and engine cooling passages. Zebra mussels rapidly form colonies which can clog intake pipes, foul boat hulls and engines, cover recreational beaches and destroy underwater artifacts. In 1993, zebra mussel colonies were discovered in southern Lake Champlain and larvae have been found as far north as Alburg. In infested waters, zebra mussels remove larger quantities of phytoplankton, impacting the aquatic ecosystem. Currently no method is known to completely eliminate the impacts of zebra mussel infestations. Control methods include using filters to reduce

zebra mussel entry and establishment and removal by scraping, back flushing, and oxygen deprivation. At this point no zebra mussels have been reported in Malletts Bay, however, Michael Hauser with the Vermont Department of Environmental Conservation (DEC) expects there will be sightings by the summer of 1996. Two sites in the Outer Bay are being monitored by the Vermont DEC, and one site in the Inner Bay is a Preliminary Zebra Mussel Watch Station.

Sea lamprey is a marine parasite which attacks salmon, lake trout and other fish species. Many anglers at the public meetings commented that ongoing control programs are being effective as they are seeing significant increases in their salmon catch. Management control methods include the use of lampricides and barrier dams on rivers within the Lake Champlain basin.

Management Goal

Improve and maintain the water quality of Malletts Bay to ensure safe water contact recreation activities.

Monitor and prevent the introduction/spread of non-native, nuisance aquatic species in Malletts Bay.

Key Indicator Standards

- Maintain test results below the State Standards for fecal coliform and E. coli bacteria for water contact recreation activities at all test sites.
- Establish acceptable standards for aquatic nuisance plants after a year of monitoring.

Monitoring

- Continue the annual Water Quality Monitoring Program.
- Establish an Aquatic Nuisance Monitoring Program.

Management Objectives

1. Identify and address water quality septic issues: leaking systems, dumping of boat holding tanks, and lack of public restrooms for recreationists.
2. Develop public education on water quality septic issues.
3. Coordinate aquatic nuisance monitoring and control strategies in Malletts Bay.
4. Develop public education on aquatic nuisance species.

Management Strategies

1. Continue the **Water Quality Monitoring Program**, identifying septic hot spots, and prepare strategies to address:
 - Short term: Encourage replacement or repair of leaking or failed systems and regular pumpouts.
 - Long term: Provide sewer to the more populated areas along Malletts Bay. As a potentially less expensive alternative, consider a Solar Aquatic Waste Water System.**Responsibility:** Town of Colchester Water Quality Monitoring Program and the Selectboard.
2. Increase **public education on the regulations against dumping of boat holding tanks** and the potential health risks; include "no dumping" regulations on public education posters discussed in the Boating Conflicts section.
Responsibility: Harbormaster and marinas.
3. Increase the U.S. Coast Guard "Courtesy Inspection" to include **checking the closure of the "Y" valve on boat holding tanks.**

4. Include public restrooms at the existing Malletts Bay Fish and Wildlife Access Area or at any of the potential new public docks. Review the potentials of developing pumpout facilities at the Fish and Wildlife Access Area; however the preference is to improve facilities at marinas with state aid, where there would be an attendant available. See Management Strategy 5.
Responsibility: Vermont Department of Fish and Wildlife.
5. The Colchester Zoning regulation requires all marinas allowing transient dock space and berthing of boats with holding tanks to provide public restrooms and boat holding tank pumpout facilities. Encourage state cost-sharing to help marinas providing free pumpout facilities. Call Secretary of the Agency of Natural Resources to prioritize providing this cost-sharing.
Responsibility: Malletts Bay Harbor Commission, Marina Associations and VT ANR.
6. Provide public education pamphlets to all shorefront residents on "best management practices" for shoreland improvements and development regarding water quality protection from erosion and septic contamination. Existing public education information available includes:
Nonpoint Source Pollution Fact Sheet - a four page informational fact sheet that defines nonpoint pollution, describes where it comes from, the sources and types, and how you can help to reduce nonpoint source pollution in the Basin.
Responsibility: Town staff, including Health Officer and Sewage Officer, working with the Harbor Commission utilizing existing VT DEC materials.
7. Develop a **Malletts Bay Aquatic Nuisance Coordinator** pilot project to propose to the Lake Champlain Basin Program for possible funding. Extend the position of the existing Water Quality Coordinator to include monitoring for aquatic nuisance species. The Coordinator could be trained by staff of the VT DEC in biological monitoring programs to recognize non-native nuisance plants and animals. The data would be collected and submitted to the appropriate agencies.
Responsibility: Malletts Bay Harbor Commission to initiate, recommending to Town, and then to Lake Champlain Basin Program. Work with VT DEC.
8. The Aquatic Nuisance Coordinator would also be responsible for collecting existing and **preparing public information and workshops** to advise shoreline residents and boaters of measures they can take to control the introduction and spread of nuisance species in Malletts Bay.
Public Education Materials available on zebra mussels:
Zebra Mussel Fact Sheet - a four page informational fact sheet that defines the problems which zebra mussels pose to Lake Champlain, describes the life history, outlines actions we can take to slow the spread of zebra mussels and additional resource information.
Zebra Mussel Identification Cards - a pocket-size informational card which outlines how to identify the species and who to contact.
Be Aware of Zebra Mussels - an introduction to zebra mussel impacts and spread prevention. VT DEC. May, 1994.
Tips for Lakeshore Residents - protecting residential water supply systems from the threat of zebra mussels. VT DEC May, 1994.
9. Develop a wash down station at the Malletts Bay Fish and Wildlife Access Area to control the spread of Eurasian watermilfoil and zebra mussels.
Responsibility: VT Department of Fish and Wildlife and VT DEC.

Fish, Wildlife, and Wetlands

Issue Description

The Natural Heritage GIS data inventory is a composite of information from the State of Vermont Agency of Natural Resources and Fish and Wildlife Department's Natural Heritage Program, identifying rare, threatened, and endangered species sites and significant natural communities. Shoreline areas identified as the Natural Heritage Inventory sites include:

- the wetlands on the south side of the Lamoille River
- Clay Point
- the entire northern shoreline of the Inner Bay (Braeloch area)
- the Malletts Bay State Park parcel

- Malletts Creek
- the islands off Malletts Head
- the knob on the northwest shore of Malletts Head
- the large wetland between Mills and Porter Point
- Cave and Marble Islands

There are no specific mapped aquatic habitat or more specific wildlife habitat data. Tom Myers, of Vermont Agency of Natural Resources, Fish and Wildlife Department's Essex Junction office, holds that "the whole bay is extremely important for waterfowl and fur bearers." Diving and dabbling ducks rely on underwater aquatics; shallow areas are important for waterfowl feeding and broad rearing.

The Malletts Creek wetlands complex has been identified as particularly significant for wildlife, providing breeding habitat for black ducks, mallards, wood ducks, blue winged teal, muskrat, and beaver, among others and has been targeted for protection under the Wetlands Acquisition Strategy (Lake Champlain Management Conference, *Opportunities for Action*, 1994.)

Management Goal

Manage the ecological communities to ensure no decline in abundance of diversity and to provide continuing social and environmental benefits.

Key Indicator Standard

At this point, not enough information is available to set standards.

Monitoring

Establish an Indicator Species Monitoring Program.

Management Objectives

1. Minimize adverse impacts of water-based recreation on the environmental qualities of Malletts Bay.
2. Promote the identification, designation, and protection of rare, threatened, and endangered species and significant natural communities.
3. Provide public education to landowners, recreationists, and school children on best management practices for habitat enhancement and protection.

Management Strategies

1. Identify **Conservation Water Management Zones** at Malletts Creek and the water surface area abutting the wetlands between Mills and Porter Point and the south bank of Lamoille River. (See the section on Water Management Zones.)
Responsibility: Planning Commission through authority from Water Resources Board. (May need the Environmental Commission.)
2. Conduct a **comprehensive bay-wide study** to determine and refine information regarding critical fish and wildlife habitats and wetlands to be protected. The University of Vermont (UVM) Environmental Program and/or Field Naturalist Program would be potential coordinators of the study. Revise and add Conservation Water Management Zones as needed to reflect the results of this study.
Responsibility: Malletts Bay Harbor Commission to initiate with UVM Environmental Program and/or Field Naturalist Program.

3. Establish an **Indicator Species Monitoring Program** through the high school curricula focusing on the environmental issues of Malletts Bay building upon information established in the bay-wide study suggested above. Submit an annual report to the town, the Vermont Agency of Natural Resources, and the Lake Champlain Basin Program.
Responsibility: Malletts Bay Harbor Commission to initiate contact with Bill Ramond with the Colchester High School, who has expressed enthusiasm and interest in his students implementing this strategy.
4. Through the studies above, identify **priority parcels for public acquisition, protection, and conservation easements.**
Responsibility: Malletts Bay Harbor Commission and Colchester Land Trust.
5. Review and revise the town regulation of the **Shoreland Overlay district to include "best management practices"** for property owners planning improvements or development.
Responsibility: Planning Commission and Environmental Commission.
6. Provide public education information to shorefront property owners in **"best management practices" for enhancing wildlife habitat and shoreland protection.**
Responsibility: Planning Commission.
7. Coordinate an **annual shoreland revegetation event** where shorefront residents can purchase appropriate species, through the County Extension or Natural Resources Conservation Services' regular plant offerings.
Responsibility: Malletts Bay Harbor Commission and High School Monitoring Program suggested in 3.

Marinas, Moorings, Docks, and Anchorages

Issue Description

The number of moorings associated with marinas and boating associations along the southwest shore of the Inner Bay has been a growing concern for many recreation users, shoreline residents, and officials with jurisdictions in Malletts Bay. Specific concerns regarding the moorings are: conflicts with navigation, increased congestion, reduction in usable space for recreation activity, poorly marked and illegally placed moorings, and visual impact. Some feel the currently proposed mooring regulations offer few restrictions in the number and placement of moorings while others, both private landowners and marina owners, fear they will have to remove their moorings as they feel the regulations are ambiguous and decisions are left up to the Harbormaster.

Several survey respondents, public meeting attendees and key informants expressed concern that there needs to be more control over marinas in the number and locations of their moorings. The only restriction on the number of boats associated with a commercial mooring is the current zoning regulation which requires one off-street parking space per berth. Residential marinas are required to have a minimum of 150' lake frontage for 5 boats and 30' for each additional boat. Marinas are permitted only in Commercial Zones. Current commercial zones with shorefront on Malletts Bay are all located along the south shore of the Inner Bay and the Marble Island Resort property on Malletts Head. Residential marinas are permitted in all residential zones, which includes all the shoreline of both Inner and Outer Malletts Bay with the exception of the commercial and wetlands/floodplain parcels.

The following conditions are necessary for locating dense moorings, docks, and anchorages:

- where physical conditions are suitable:
 - protection from southwest winds and waves
 - water depth generally of five to thirty feet
 - bottom conditions allowing a firm hold
- where shoreline conditions are suitable:
 - road and shoreline access
 - adequate parking
 - where services are available

- where they will not conflict with recreation uses and will not compound boating congestion and conflicts.

According to several marina owners, the demand for moorings and dock space has decreased recently. If more shoreline activities and facilities were developed, we would expect an increase in demand for transient spaces and anchorages. Many of the marinas offer some day-use and overnight dock or mooring space, however, the public is not always aware of these. No publicly-owned dock space or moorings are currently available.

Marinas

All the marinas and boating associations of Malletts Bay are located on the south and southwest shores of the Inner Bay, accommodating approximately 800 boats, fairly evenly split between moorings and dock slips.

Most of the marinas accommodate the majority of the boats through dock slips while the Malletts Bay Boat Club and the International Sailing School rely entirely upon moorings. The Malletts Bay Boat Club recently improved their standard mooring tackle and increased the space efficiency of their mooring layout.

The location of the grouping of marinas is well suited for these facilities with easy vehicular access, protection from the predominant wind and waves, and suitable water depths.

Marble Island Resort, located on Malletts Head, has permit approval for expanding from their current 60 dock slips, 40 moorings, and 66 dry stacking slots to a total of 270 boats. Much of the increased capacity is intended to accommodate transient boats. The schedule for the expansion is unclear due to a recent extensive fire at the resort's main building.

The perspective of the Steering Committee is to implement and monitor the effect of management strategies that focus on education and enforcement before imposing restrictions on the number of boats. However, given the location of all the marinas and boating associations on the southwest shore of the Inner Bay, and that approximately one-third of boaters access the Bay from these facilities, it is safe to say the marinas are contributing to the perceived crowding and boating conflicts in the Narrows and the central area of the Inner Bay. It would be expected that small increases in the number of berths at marinas would have minimal impact on the average peak usage, given the average of 7.1% of boats berthed to be in active use at peak hours. On the contrary, increases in the capacity of the Fish and Wildlife Access Area would have a very direct impact. Under the section on Public Access, a management strategy is proposed to not expand the capacity of the existing Fish and Wildlife Access Area. Likewise, a process should be developed to determine a limit on the number of boat berths if the level of perceived crowding remains above the standard after the implementation of the priority management strategies addressing boating behavior and patterns and at least two more years of monitoring.

Docks

Docks at marinas and boat clubs provide efficient accommodations, decreasing the surface area and visual impacts of the volume of boats. Several public meeting attendees and key informants suggested marinas should be encourage to accommodate all boats, excepting those requiring greater depth, in dock slips.

Anchorages

Two Special Anchorage Areas are designated in the Inner Bay: one east of Malletts Head and the other east of Coates Island. These areas are highly suitable for anchorage providing protection from the

preliminary wind and waves and located near services and facilities. Boats are actually permitted to anchor everywhere in the public waters provided their lights are left on when it is dark. The Special Anchorage Area designation relieves anchored boats of the requirement to be lighted. Niquette Bay and other small bays along the north shore of the Inner Bay are frequently utilized for transient sailboat anchoring.

Moorings

Once moorings occupy an area, that water surface is no longer available for any recreational use. Likewise the location of dense moorings can have direct impacts on the boating patterns affecting the level of perceived crowding and boating conflicts. Therefore, it is critical to carefully site mooring fields to ensure minimal impact on the diversity and quality of the recreational activities while still providing adequate mooring space. The current mooring management zones cover the entire Colchester shoreline of Malletts Bay with the exclusion of Causeway. When reviewing the location of these mooring management zones with the Appropriate Recreation Use Map (Figure 16), we see the zones overlap most frequently with the potential uses of fishing, canoeing/kayaking, and day use anchoring. The following discussion reviews the Colchester shoreline for its suitability for moorings and water-based recreation uses.

Currently, the **highest density of moorings is located east of Malletts Head and Coates Island**. This area is well suited for moorings with easy vehicular access to the shoreline, protection from the predominant winds, and suitable water depths. Without the dense moorings, this area could provide calm waters for canoeing/kayaking and fishing, but is too constricted and for motorboat cruising or water skiing, and too protected for much sailing or windsurfing. The high suitability for moorings, particularly the ease of vehicular access to the shoreline, justifies this area for high density mooring fields, on the condition that other areas of the bay can accommodate the “displaced” uses. However, there is concern that without clearly defined limits the moorings will continue to spread across the water surface. The mooring fields should be carefully delineated with associated densities and consideration be given on how to encourage the usage of docks.

The area **between Bayside Park and Nourse’s Corner** is somewhat more exposed to wind and waves but could be developed as a dense mooring field. According to the Appropriate Recreation Use Map this area is also well suited for fishing, cruising motorboats, and canoeing/kayaking; most of these activities can be accommodated in others areas of the Bay. However, a critical concern is the current level of conflicts reported in the Inner Bay and through the Narrows and the high amount of public viewing points along this stretch of shoreline. Significantly increasing the number of moorings in the Inner Bay will likely increase the perceived crowding and extent of conflicts in these areas. Filling the area with moorings would also significantly alter the view of the water. If management strategies to reduce conflicts and perceptions of crowding were implemented and effective, then developing this area as a dense mooring field could be justified, but only if there is careful attention to public viewpoints. Should the efforts to develop, or redevelop, a thriving commercial tourist center along Lakeshore Drive be implemented, the demand for moorings and docks will likely increase, putting pressure on this area to accommodate the growth.

The area off **Thayers Beach** is well suited for a diversity of uses including day use motorboat anchoring, swimming, water skiing, and canoeing/kayaking. The qualities of this area are somewhat unique and highly valued by motorboaters, swimmers and water skiers. Likewise, the shallow water depths detract from the attractiveness of this area for a dense mooring field. Therefore, the delineation and density of this mooring management zone should be limited to ensure the continued recreation uses. There is a parallel situation in **Niquette Bay** with deeper waters. Here the area is well suited for day use sailboat anchoring, windsurfing, fishing, canoeing/kayaking, and scuba diving. To a degree, the exposure to winds and waves, and reduced accessibility from public roads, diminishes the attractiveness for extensive moorings, however, it is popular for transient anchorage.

The northwest shores of Outer Malletts Bay, around Clay Point, receives relatively little use. This area of Malletts Bay is the most exposed to winds and waves, with stretches of shallow, weedy waters. This area offers relatively limited potentials for both extensive recreational uses and moorings. According to the pending town mooring regulations, moorings must be accessed within 1000' across private property by the shoreline resident or by others with permission or rights of way from the landowner. Should it be determined that there is a strong correlation between perceived crowding and peak hour boat usage as discussed under marinas the number of private berths could be limited by the linear feet of shoreline, with varying ratios to reflect the suitability of the zone to moorings or recreation activities and the relative impact on areas of higher perceived crowding and boating conflicts.

Management Goal

Ensure adequate berthing and anchorage for seasonal and transient boats in appropriate locations where they will not conflict with recreation uses and will not compound boating conflicts, perceived crowding, and visual impacts.

Monitoring

Require every boat berth to be registered annually with the Harbormaster noting boat owner's name and berth location, and means of access.

Review monitoring results of survey conducted every year. Correlate perceived crowding and peak boat usage, to determine if limits on berth spaces is justified.

Management Objectives

1. Identify areas for high density and low density boat berthing and suggest a means to limit the commercial and private boat berthing relative to boating patterns, conflicts, perceived crowding, suitable conditions, and impact on diversity and quality of recreational activities.
2. Encourage the most efficient layout of mooring fields, and anchorages in appropriate locations relative to facilities and suitable conditions, accessibility, and navigation.
3. Provide adequate boat berthing and anchorage for seasonal and transient boaters.
4. Identify areas where boat berthing should be prohibited relative to environmental constraints, navigational hazards, and impact on recreational use of the public waters.

Management Strategies

1. Establish a means to limit the number of berths associated with marinas and boating associations.

An approach to determine a limit to the number of commercial berths in Malletts Bay is as follows:

- a. Establish the Perceived Crowding Key Indicator Standard at 60% of survey respondents.
Note: The 1994 data indicated a 62% perceived crowding. We anticipate the implementation of the various management strategies suggested in the previous sections will affect the perceived crowding, potentially decreasing the perceived crowding.
- b. Increase the data base of perceived crowding and peak hour usage by monitoring yearly. (See discussion on Monitoring in the Implementation section).
Note: For 5 intensive 1994 survey days we correlated Perceptions of Crowding with peak hour usage for those days. The data was not ample enough to draw solid conclusions.
- c. After two more summers of data collection, determine if there is a strong correlation between average peak hour usage and perceived crowding. Statistically, this would mean an r value of .8 or higher and at least 10 observations.

- d. If these conditions of a. b. and c. above are met, continue through the steps outlined below:
 - 1) Develop a regression model correlating peak hour usage and perceived crowding.
Note: A regression model was built from the 1994 survey data with a .79 r value but only 5 observation days. See Figure 13. Again, it is felt the data is extremely scant to justify this as a basis for establishing limits.
 - 2) Determine the average peak hour percentage of marina boats in use.
Note: The 1994 data indicates that at average peak hour usage only 7.1% of boats berthed at marinas were in use. This figure is supported by two previous studies. The Lake Champlain Boat Study data for Malletts Bay indicated that 7.3% of total boats on Malletts Bay were moving, fishing, or anchoring, while a 1980 count shows 7.8% of the total boats on Malletts Bay were moving, fishing, or anchoring.
 - 3) Determine the number of marina berths that would trigger the 60% perceived crowding:
 - Identify on the regression model the number of boats correlating with 60% perceived crowding.
 - Multiply that number by fraction of average peak hour usage boaters accessing through marinas and boating associations.
Note: The 1994 data indicates that one-third of boaters began their trips from marinas or boating associations.
 - Divide that number by the average peak hour percentage of marina boats in use.
 - Compare that number with the actual number of commercial berths to determine the possible percent increase staying within the target of 60% perceived crowding.

There are several caveats to be considered in the method suggested above:

- Boaters more sensitive to perceived crowding may decide not to boat on Malletts Bay again. This is referred to as displacement.
- The method focuses only on the marinas and boating associations. Management strategies affecting the amount of use at the Fish and Wildlife Access Area and private berths should be factored in.
- Data should be gathered regarding the number of boats originating outside Malletts Bay and be factored in.

Responsibility: Malletts Bay Harbor Commission in an advisory role to the Planning Commission with review by the Water Resources Board.

2. Review marina and boating associations development plans for expanding existing or proposing new berthing facilities for impact on boating patterns, perceived crowding and boating conflicts, particularly in the Inner Bay. The computer model proposed for Phase Two should provide the tools to review development plans.

In Phase Two of the Recreation Management Plan, the Mooring Management Zones Plan, and the Vessels, Moorings, and Waterways document should be revised to reflect the following recommendations.

3. Establish dense mooring field layouts to reduce the extent of surface water usage, respecting marina needs, safety, navigation routes, recreational activities and scenic values. See Appendix A.
 - a. East of Malletts Head.
 - 1) Determine Marble Island Resort's plans and schedule. If planning to proceed with expansion of berths, include the permitted moorings as a mooring field. See Appendix A.
 - b. East Spaulding Bay
 - 1) Establishment of the Fairway. See Appendix A.
 - c. East of Coates Island
 - 1) Identify a high density mooring field in the area suggesting a proportion to be available for public moorings, and transient uses. See Appendix A.
 - 2) Provide a phasing plan for marinas, boat clubs or associations to comply with the mooring field limits.

- 3) Provide incentives for the utilization of dock slips instead of moorings. (However, the Steering Committee and consultants struggled to no avail to determine incentives which may be effective. The identification of the mooring field with established limits to capacity may be the incentive for going to dock space.)
- 4) Maintain the special anchorage designation.
- 5) Require all private boaters accessing within 500' to be located in the mooring field.
- d. Limits may be imposed upon the number of berths or percent of increase permitted per marina. (See 1. above).
4. **Malletts Bay State Park**
 - a. No berths except a potential public dock for access to the Park. See Conservation Zone in the section on Water Management Zones.
5. **South Shore of Lamoille River**
 - a. No berths. See Conservation Zones in the section on Water Management Zones.
6. **Sweeping continuous southern shore of the Outer Bay including Thayers Beach.**
 - a. Limit berths to 1 per 100' of shoreline frontage to maintain this prime recreational use area.
7. **Between Porters and Mill Points**
 - a. No berths. See Conservation Zone in the section on Water Management Zones.
8. **All other shoreline area, moorings, to be within 500' of the mean low water mark.**
 - a. Requests to locate farther than 500' due to inadequate water depths or other hardships may be permitted by appeal to the Harbormaster.
 - b. Five or more berths accessing per property constitutes a Residential Marina requiring 150' shoreline frontage for 5 boats and 30' for each additional boat as proposed in the Vessels, Moorings, and Waterways document.
 - c. The method described in 1. above should also be utilized to determine a limit to the number of private moorings should the perceived crowding persist above the 60% standard. Data for private berths would replace that of commercial berths in steps d.2) on. Consideration on the number of berths per shoreline property access could be limited by shoreline frontage, varying to reflect relative impact on boating patterns, areas of high amounts of boating conflict and perceived crowding. It is expected that private berths along the shorelines of the Inner Bay would have greater impact on these issues and would require tighter restrictions. This concept would require careful review under the Vermont definition of the Public Trust Doctrine. Again, at this point, the recommendation is to focus on management strategies emphasizing public education, development of new small boat public accesses and enforcement of existing regulations before the imposition of restrictions on the number of boats berthing in the Bay. The development of the computer model in Phase II should be able to address the effects of the these potential restrictions.
9. **Mooring Tackle**

A subcommittee of the Steering Committee developed the following management strategies to address the concerns regarding permanent moorings and the hazards they cause to early spring anglers and snowmobilers:

 - a. **Permanent Moorings**
 - 1) Paint the exposed portion of the unit fluorescent orange
 - 2) Enforce state law requiring the name and address be visible at all times.
 - 3) Encourage manufacturer to explore the potential of a breakaway type plastic top that will allow the main shaft to be sunk in the winter.
 - b. **All other types of moorings**
 - 1) Paint the exposed portion of the unit fluorescent orange
 - 2) Enforce state law requiring the name and address be visible at all times.
 - 3) Remove all paraphernalia and drop chain to bottom for winter or remove the entire mooring.

Responsibility: Malletts Bay Harbor Commission to encourage required regulations through Phase II of the Malletts Bay Recreation Management Plan. Approval required from the Colchester Selectboard and the Water Resources Board. Enforcement through the Harbormaster.

Implementation of the Recreation Management Plan

The following steps are suggested as the means for implementing the Malletts Bay Recreation Management Plan including:

- The identification of the local administration responsible for overseeing the implementation and
- The integration of locational management strategies into one map of Water Management Zones with associated policies for each zone.

Local Administration of the Malletts Bay Recreation Management Plan

The Malletts Bay Recreation Management Plan is designed to be a tool which addresses the management issues and resources of the bay. It is expected that over time the recreation activities, expectations, perceptions, and issues will change, and the Management Plan will need updating, including revisions to the major issues needing addressing, the management objectives, the key indicator standards, and management strategies.

It is recommended that one local organizational body be responsible for coordinating the implementation and updating of the Malletts Bay Recreation Management Plan.

Establishment of the Malletts Bay Harbor Commission

The Malletts Bay Harbor Commission should be established with the primary function of overseeing the implementation of the Malletts Bay Recreation Management Plan. The Commission's responsibilities would include:

- Prioritizing and initiating the management strategies.
- Research funding opportunities for implementing the management strategies.
- Coordinating the monitoring efforts and comparing the data with the Key Indicator Standards.
- Coordinating the collection and/or preparation and distribution of educational materials.
- Reviewing all proposed waterfront development projects for consistency with the goals, objectives, and management strategies of the Recreation Management Plan, in an advisory role reporting to the Planning Commission.
- Update and revise the Malletts Bay Recreation Management Plan every five years.

Accountability: The Malletts Bay Harbor Commission shall report to the Selectboard and cooperate with the other boards and commissions on bay related issues.

Membership

- a. The Malletts Bay Harbor Commission shall be comprised of eleven (11) members who are registered voters of the Town of Colchester, four (4) of whom will serve as ex-officio members. One (1) ex-officio member shall be from the Selectboard, the remaining three (3) shall be representatives of Town departments, boards, or commissions. For at least the first year of the Malletts Bay Harbor Commission's established permanent term, a majority of the Commission's seven (7) full members shall be comprised of active members of the existing Malletts Bay Steering Committee. Beginning with the second year of the Committee's term, the eleven (11) members shall be representatives of the varied interests of the bay, including but not limited to the following:

Relevant Departments, Boards, and Commissions At Large

Planning and Zoning

Parks and Recreation

Town Manager

Colchester Community Development Corporation

Redevelopment Committee

Selectboard

Recreational Users

Shorefront Property Owners

Marina Owners and Waterfront Businesses

Planning Commission Lakeshore

Conservation Organizations and Land Trusts

- b. The Commission members shall be appointed by the Selectboard, each member to serve a term of two years. The initial appointment for all members shall be for one year with a subsequent appointment of one year duration for the first three members appointed to the Commission and two year duration for the remaining four members. Thereafter appointment shall be for a two year duration.
- c. The chairperson and secretary shall be elected by the members of this Commission; the Commission will follow Robert's Rules for governance.
- d. The Committee shall meet at the request of the chairperson or a quorum. All meetings shall be open to the public. The Commission will keep a record of its proceedings and actions which shall be kept on file and open to the public at the office of the Town Clerk.
- e. Four (4) of the members of the Malletts Bay Harbor Commission shall constitute a quorum. The concurring vote of a simple majority of members present and eligible to vote is required to pass on any issue.
- f. Consider a quarter-time planning staff needed to coordinate work.

Planning Commission

The Planning Commission is responsible for the planning and review of developments. As such, the Planning Commission is responsible for planning the location of public facilities, working with the Malletts Bay Harbor Commission, and consultants as needed, and for reviewing waterfront marina development projects for adequacy of on-site facilities and shoreline frontage for the number of berths proposed. The Planning Commission will consider review comments of the Malletts Bay Harbor Commission regarding the impacts of proposed developments of boating patterns, boating conflicts, perceived crowding, public access, cultural resources and tourism opportunities, protection of natural resources, and water quality protection.

The Harbormaster

The Harbormaster maintains existing responsibilities to emphasize safety, boating courtesy, and the control of health hazards through the enforcement of boating statutes, identifying safety hazards, monitoring solid and liquid wastes in the bay, and coordinating town and state official responses in emergencies, accidents, and disasters. The Harbormaster also is responsible for inventory of docks, moorings, and slips, and water management.

The Harbormaster is responsible for designating and enforcing the water management zones and use areas of: Conservation, Low Intensity, High Intensity, Commercial, Fairways, Mooring Fields, and Moorings Zones and Swimming, Shoreline Fishing, Water Skiing, and Personal Watercraft stunting use areas.

Water Management Zones

Many of the management strategies proposed in the previous sections have implications for specific places along the shore or in the waters of Malletts Bay. The following map of proposed Water Management Zones and associated policies is an attempt to integrate the myriad management strategies into a comprehensive management plan.

Purpose:

The purpose of the Water Management Zones is to ensure a diversity of uses of Malletts Bay, while:

- Minimizing boating conflicts and perceived crowding.
- Providing adequate access.
- Identifying areas for enhancing cultural resources and tourism opportunities.

- Improving and maintaining water quality and addressing aquatic nuisances.
- Protecting critical habitats.
- Managing marinas, moorings, docks, and anchorages.

Proposed Water Management Zones

Conservation Area
Low Intensity Use
High Intensity Use
Multi Purpose Use
Navigational Routes

See the Proposed Water Management Zones Map (Figure 18).

Conservation Water Management Zone

Purpose: To protect areas with scenic values, plant and wildlife habitat and wetlands, maintaining high water quality and natural shoreline conditions.

Appropriate Uses: Canoeing/kayaking, sailboarding, scuba diving, anchoring, no-wake motorized travel, fishing, hunting, duck blinds, and nature enjoyment. Conservation zones about shorelines of natural undisturbed conditions, scenic qualities and/or significant habitats, such as wetlands. These areas may also be unsuited for moorings or structures due to their unique significance, or exposure to wind and waves, or flooding and erosion.

Location: Four separate areas are identified as Conservation Zones: Malletts Creek, Lamoille River, waters off of the Malletts Bay State Park, and the area between Mills and Porters Points (the Colchester Bog).

The boundary line for Malletts Creek would be from a line drawn across the narrowest point of the mouth of the Creek and all Class II wetlands inland. These wetlands should be field delineated and mapped. The boundary line for the Lamoille River and Sand Bar area would be all of the designated Wildlife Refuge plus all the surrounding waters to 5' bathymetry line. The boundary line for the third area is 500' from the mean low water level (95.5') extending along the shoreline frontage of the Malletts Bay State Park. The boundary line for the last area is 500' from the mean low water level extending from the wetlands area between Mills and Porter Points.

Policies:

- No additional mooring boats permitted beyond those that are existing at the time of acceptance of the Management Plan.
- No additional docks, floats, or boat lifts beyond those that are existing at the time of acceptance of the Management Plan.
- Can develop public facilities, providing for the appropriate uses of nature enjoyment.
- Acquisition of land and permanent conservation restriction on abutting land is encouraged.
- In order to preserve the natural shoreline and wetland functions, activities and alterations such as structural shoreline protection should not be allowed.
- No new direct untreated stormwater discharges shall be permitted.
- A potential cartop launch access site is proposed at Malletts Bay State Park.

Low Intensity Use

Purpose: To maintain areas with scenic and natural habitat values, maintaining water quality while providing for low intensity uses that will not detract from these values.

Appropriate Uses: Uses include fishing, day use anchoring, no-wake motorized travel within 200' of the shoreline, swimming, shoreline fishing, sailboarding, canoeing/kayaking, scuba-diving, limited-density moorings and docks. Winter uses include ice fishing, ice skating, cross country skiing, and slow speed snowmobiling.

Location: These areas are the water area extending 500' into the bay from the mean low water level of predominantly residential shorelines. The entire shoreline of the Outer Bay and the northern shoreline of the Inner Bay, with the exclusion of the areas identified as Conservation Zones.

Policies:

- Private non-commercial moorings should be located within 500' of the mean low water level. Appeals could be made to the Harbormaster where shallow depths or other conditions make this a hardship.
- Encourage shorefront property owners to use native species revegetation and non-structural shoreline protections as preferred methods.
- Configuration of moorings and location of activities and alterations shall not significantly interfere with public use and enjoyment of the public waters. Special attention is due to the Thayers Beach area.
- Potential public boat accesses are identified in the Low-Intensity Use Zones: Small motorized and non-motorized boat accesses at the base of the Causeway by Mills Point, OR along Thayers Beach at Rosetti's property.

High Intensity Recreational Use

Purpose: To provide, maintain, and enhance areas for high intensity boating and services that support that activity.

Appropriate Uses: High intensity recreational boating and water dependent uses including mooring fields and anchorages, navigation channels and fairways. Motorboating, sailing, sailboarding, water skiing, personal watercrafting, and non-motorized uses are predominant. Winter uses include ice fishing, ice sailing, ice skating, snowmobiling, and cross country skiing.

Location: The southwest area of the Inner Bay from Nourse's Corner to the top of Malletts Head including the special anchorage areas and high traffic areas of the Inner Bay, with the exception of the water along shoreline from Bayside Park to the base of Coates Island, and East Spaulding Bay.

Policies:

- Proposed activities or alterations will be permitted that enhance the quality and safety of recreation boating activities.
- Planning and management decisions regarding this area will prioritize mooring fields, public shoreline access such as waterfront parks, beaches, and other water dependent facilities that support recreational boating and enhance public access.
- Planning and management decisions regarding this area should focus on reducing boating conflicts and perceived crowding.
- Improve and maintain water quality at levels suitable for water-contact recreational activities.
- Potential public access is identified at Nourse's Corner for cartop launch sties.

Multi-Purpose Use

Purpose: To accommodate a diversity of water-based recreational activities on the large expanses of unobstructed water.

Appropriate Uses: Motorboating, sailing, deep-water fishing, water skiing, sailboarding, personal watercrafting, paddling, and new activities that can be safely accommodated. Winter uses include ice fishing, ice sailing, ice skating, snowmobiling, and cross country skiing.

Specific designated use areas include: Brown Ledge Camp Water Skiing, Slalom Ski Course, and Personal Watercraft Stunt Area.

Location: The large expanses of unobstructed waters in Inner and Outer Malletts Bay.

Policies:

- Safely accommodate the diversity of water-based activities, including new sports.
- Establish areas and time for races, tournaments and special uses to avoid conflicts: i.e., sailing races, fishing tournaments, water skiing events, personal watercraft "stunt riding."
- Maintain the area free of moorings and other obstructions to water-based recreationists.
- Planning and management decisions for this area will prioritize unobstructed water for multiple water-dependent recreational activities from alterations and activities that threaten boat safety, and increase boating conflicts or perceived crowding.

Commercial Use

Purpose: Maintain and enhance bayside commercial facilities to efficiently accommodate the diversity of water-based recreationists in a scenic, well-maintained setting, while promoting the local community economy.

Appropriate Uses: Moorings, marinas, access ramps, docks, fishing piers, boardwalks, moorings, tour boat facilities, observation areas, swimming. Winter uses include any activities not encumbered by the presence of the boating facilities.

Location: The southwest shoreline of the Inner Bay extending into the bay 500' from the mean low water level from Coates Island to Bayside Park, and the innermost area of East Spaulding Bay.

Policies:

- Coordinate with the Lakeshore Redevelopment efforts.
- Encourage and upgrade the provision of support facilities for water-based recreationists.
- Upgrade and maintain boat storage areas, loading and unloading, and servicing of recreational craft.
- Encourage facilities for public access to the shoreline (including visual and pedestrian access.)
- Enhance and maintain high water quality.
- Plan for installation of a sewer system.
- Strict controls on fuel handling facilities.
- Do not increase the capacity of the Malletts Bay Fish and Wildlife Access Area, but make improvements as discussed in sections on Public Access, Management Strategy 1b.
- Continue to monitor peak boat usage and perceived crowding to determine if there is a strong correlation. If yes, consider placing limits on the number of berths permitted at marinas and boating associations.
- Utilize Fish and Wildlife Access Area and marinas as education outlets.

Navigational Routes, Channels, and Fairways

Purpose: Maintain safe water passage from high density moorings in the Inner Bay, through the Narrows and on to the Cut, or to Thayers Beach.

Appropriate Uses: Navigation only during high-use periods.

Policies:

- Educate about high-use periods or summer weekend days from 11 a.m. - 3:30 p.m. when the uses within the Narrows should be restricted to navigation only: those fishing, water skiing, or anchoring should be encouraged to find more suitable locations.
- Educate on the Cut is for navigation only: no fishing, water skiing, or anchoring permitted any time.
- Enforce no-wake zone.
- Keep free of any obstructions.
- Install and monitor temporary navigation markers in the Narrows as suggested in the Management Strategies under Boating Conflicts.

Proposed Water Management Zones

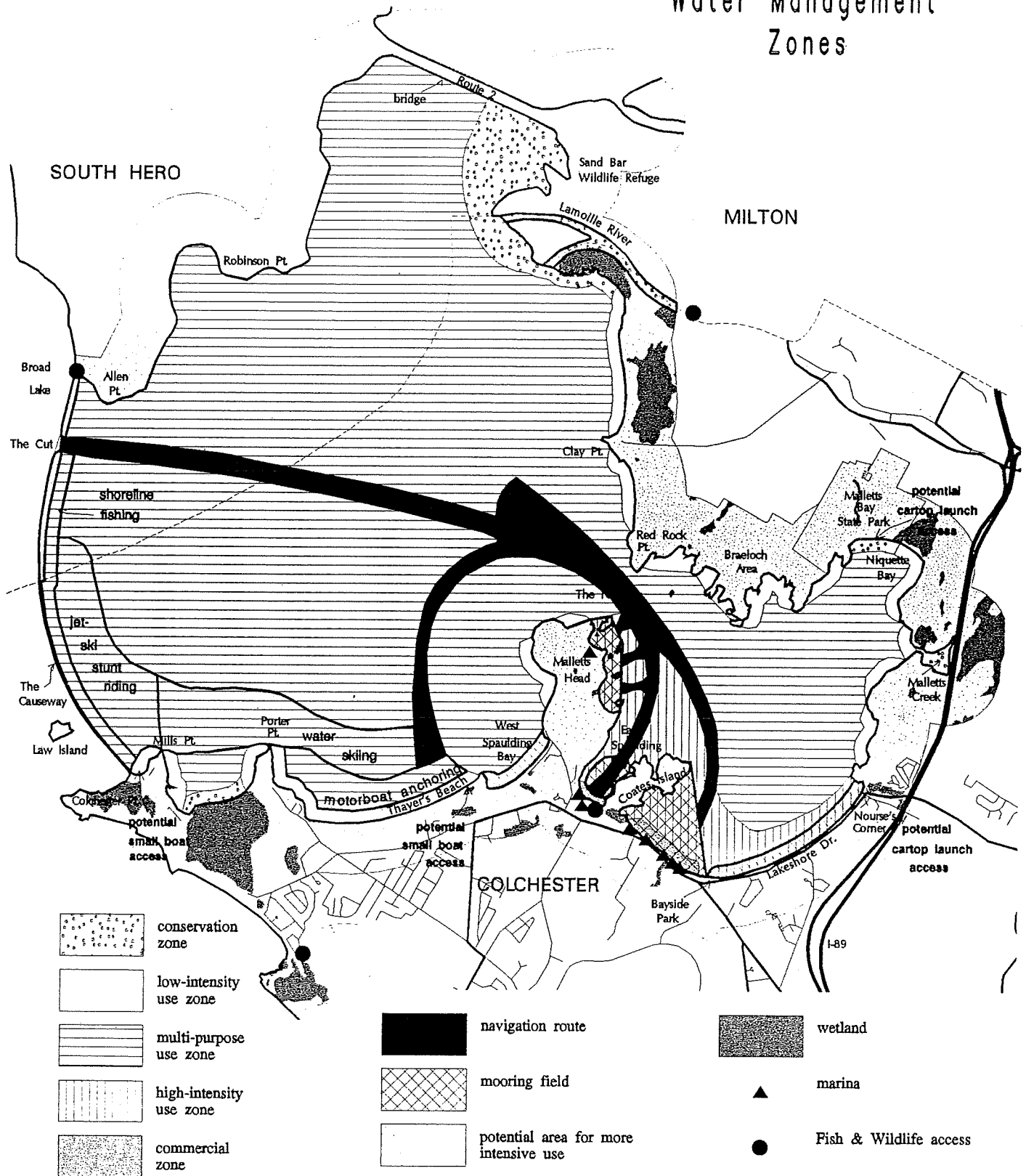


Figure 18

Prioritized Management Goals and Associated Strategies

The Steering Committee members were asked to prioritize the Management Goals through the "Analytical Hierarchy Process," which is used frequently by committees and state agencies in their decision making. Each Committee Member was asked to compare each management goal for their relative importance (See Appendix F). The responses from the Committee members were tabulated to determine the collective priority weightings. (See Table 9: Priority Weighting of Management Goals by the Steering Committee.)

Table 9. Priority Weighting of Management Goals by the Steering Committee.

<u>Criteria</u>	<u>Preference Scale, 6 Participants</u>
Improve Water Quality	0.299
Maintain Ecological Health	0.229
Provide Adequate Access	0.161
Provide Adequate Berthing	0.109
Support Cultural/Tourism Resources	0.099
Minimize Perceived Crowding	0.055
Minimize Boating Conflict	0.048

Collectively, the Steering Committee placed the highest priority on improving the water quality, followed by maintaining ecological health, then providing adequate access. Providing adequate berthing and supporting cultural resources fell in the middle, followed by minimizing perceived crowding and minimizing boating conflicts. The weightings indicate that improving water quality is 2.7 times more important than providing adequate berthing and 5.4 times more important than minimizing perceived crowding; providing adequate access is 3.4 times more important than minimizing boating conflict.

This data can be utilized to help determine priorities in implementing management strategies. Future surveys of the bay users could include questions regarding users priorities and preferences to further guide in decision making.

Based upon the priorities suggested by the Steering Committee the following Management Strategies should be on the first year agenda of the Malletts Bay Harbor Commission:

Malletts Bay Harbor Commission

1st Year Agenda:

1. Develop Town budget for implementation including staff, supplies, etc.
2. Implementation
 - a. Encourage the funding of Phase Two of the Malletts Bay Recreation Management Plan to further refine and develop the management strategies, develop a decision making model, and revise the town regulations as needed. See section on Phase Two at the end of this chapter.
 - b. Develop a standardized survey for annual monitoring. See section on Monitoring Program.
3. Water Quality
 - a. Continue the Water Quality Monitoring Program.
 - b. Encourage and support efforts to provide sewers to the more populated areas along Malletts Bay. Explore sewer alternatives such as Solar Aquatic Waste Water System.
 - c. Increase public education of the regulations against dumping of boat holding tanks.

- d. Encourage the construction of a **public restroom** at the existing Fish and Wildlife Access Area.
 - e. Contact the Secretary of the Agency of Natural Resources to develop and prioritize a **cost-sharing program** for marinas to upgrade and provide free pump-out facilities.
4. Fish, Wildlife, and Wetlands
 - a. Through the process of Phase Two of the Management Plan, ensure the **designation of Conservation Water Management Zones**.
 - b. Contact the University of Vermont Environmental Program and/or Field Naturalist Program to initiate a **comprehensive baywide study of habitats** to be protected.
 - c. Contact Bill Ramond with the Colchester High School to develop an **Indicator Species Monitoring Program** with his students.
 5. Public Access
 - a. Initiate efforts and encourage the Vermont Department of Fish and Wildlife to develop public education regarding **other public accesses within the region**.
 - b. Through Phase Two of the Recreation Management Plan, guide the consultants in the development of a **Harbor Improvement Plan** identifying:
 - Small boat access in the Outer Bay.
 - Car top access in the Inner Bay.
 - Public docks, boardwalks, public viewing, swimming areas, etc. in the Inner Bay.
 - Fishing piers in both Inner and Outer Bays.
 6. Marinas, Moorings, Docks, and Anchorages
 - a. Through the process of Phase Two of the Recreation Management Plan work with consultants to **finalize the location of mooring fields, public moorings, and anchorages** and revise town documents as needed.
 7. Cultural Resources and Tourism
 - a. As discussed in 4. above, work with consultants to develop the **Harbor Improvement Plan**; coordinate with efforts of the Lakeshore Redevelopment Committee.
 - b. Contact the following organizations to ensure Malletts Bay is included in the plans:
 - 1) **Lake Champlain Bikeways Committee.**
 - 2) **Lake Champlain Paddlers Trail.**
 8. Perceived Crowding
 - a. Coordinate **public education regarding crowded locations and times**.
 - b. Ensure the standardized survey includes questions regarding perceived crowding.
 9. Boating Conflicts
 - a. Coordinate **public education on boating rules and courtesy**.
 - b. Ensure the standardized survey includes questions regarding boating conflicts.

Monitoring Program

Phase Two of the Recreation Management Plan should include the development of a standardized survey and use count to be administered annually including not less than six weekend days, every other weekend, during the summer season. The Malletts Bay Harbor Commission will be responsible for conducting and overseeing of the monitoring program. The following are some notes to guide the development of the survey.

The survey should be administered to Fish and Wildlife Access Area users, marina users, and shoreline residents. An effort should be made to target boaters coming through the Cut.

Survey questions should include:

- Perceived Crowding
 - the standard nine point scale.
 - location where felt the most crowded.
- Boating Conflicts
 - Specifying the nature of the conflict.
 - Identify the location of the conflict.
- Water Quality
 - Develop a standard nine point scale for perception of water quality.
 - Identify location of concern.
- Facilities
 - How well did facilities meet their needs?
 - What improvements are needed, where?
- Overall Recreation Experience
 - Develop a standard nine point scale for how well the boating trip met their expectations. (This will be useful in correlating with the other questions to determine their relative importance.)
- Questions regarding priorities and preference in management strategies could be included to guide the Advisory Commission in their decision-making.

Use Counts

- Establish effective/affordable means to conduct Standardize Use Counts on the survey days. It may be possible by stationing individuals at strategic points along the shoreline and counting boats and noting activity in designated areas to ensure a count for the whole bay.
- Marina owners could be asked to count boats in use from their berths.
- Counts are needed for boats entering and leaving the bay through the Cut.

Other Annual Monitoring Efforts

- Water Quality Monitoring
- Aquatic Nuisance Monitoring
- Key Indicator Species Monitoring

Phase Two of the Malletts Bay Recreation Management Plan

Phase Two of the Malletts Bay Recreation Management Plan is dependent upon future approval and funding. The tasks of Phase Two should address focus on developing and refining tools for managing the recreation resources of Malletts Bay and regulatory documents required to implement the Plan.

Management Tools

1. Decision Making Model Development

This task shall be a land use and water use model that can predict alternative management strategies and scenarios for the study area. The intent is to be able to analyze how a change in one variable or strategy could effect or impact the others. Variables could include, but are not limited to:

- Recreational use levels and areas of bay.
- Mix of recreational uses.
- Availability of sewerage.
- Number of moorings.
- Traffic patterns, including Circumferential Highway.
- Transferred densities from shoreline to receiving areas.
- Water quality changes.
- Local (state) economic conditions.
- Population.
- Levels of service.
- Public and private access.
- Conflicts between competing uses.
- Cooperation between compatible uses.

The model shall be specific to the Malletts Bay study area but shall be capable of being adapted to other communities in the Lake Champlain Basin.

2. Standardizing Monitoring Program Development

This task would be the preparation of a cost effective standardized survey and use count with recommendations on administering and analyzing the results. See further description in the previous section titled Monitoring Program.

3. Harbor Improvement Plan

Based on the priority recommendations in the Policy and Management Plan, this task involves developing design work at the conceptual stage to implement those recommendations. The delivered product shall include plans, maps, drawings, diagrams, details and reports as required in a format that is suitable for adoption by the Town of Colchester.

Recommended Revisions to Town Documents

1. Recommended Revision to the Colchester Town Plan

The Colchester Town Plan has identified Malletts Bay as a planning area. This task shall include revisions of the current Town Plan that will be consistent with the overall Malletts Bay Recreation Management Plan. The revisions shall be drafted in a format that is in compliance with VSA statutes. The delivered product shall be in a format that is suitable for adoption by the Town of Colchester.

2. Recommended Rules to be Adopted by the Water Resources Board

The State of Vermont Water Resources Board has the authority to adopt rules regulating the use of public waters under 10 V.S.A. §1424. This task shall review recommendations of the Malletts Bay Recreation Management Plan, existing conditions and identify any existing or future use conflicts or safety problems to develop a petition for adoption by the Water Resources Board. The delivered product shall be in a format suitable for submission to the Water Resources Board.

3. **Recommended Revision to the Colchester Zoning Bylaws**

The Colchester Zoning Regulations include Article X, Shoreland District. This task shall include recommended revisions to the current Colchester Zoning Bylaws that will be consistent with the overall Malletts Bay Recreation Resource Management Plan. The delivered product shall be in a format that is suitable for adoption by the Town of Colchester.

4. **Recommended Revisions to the Colchester Subdivision Bylaws**

The current Colchester Subdivision Regulations governs the subdivision of land in accordance with the Vermont Planning and Development Act. These bylaws regulate procedures for subdivisions, required submittals, required improvements, development requirements, design standards, administration and enforcement. This task includes the review of the current bylaws and recommended revisions and/or additions that will be consistent with the Malletts Bay Recreation Resources Management Plan. The delivered product shall be in the format that is suitable for adoption by the Town of Colchester.

5. **Recommended Colchester Harbor Ordinance and Mooring Program**

This task shall review the existing Harbor Ordinance and recommend revisions that are consistent with the policy formations in Phase One. This task shall also review jurisdictional issues, rules and regulations for the Bay, administration, enforcement, resolution of problems relating to navigation and water use safety, and elimination of hazards to the public health and safety. Mooring allocation procedures shall be standardized and mooring design standards shall be recommended. The delivered product shall be in the format that is suitable for adoption by the Town of Colchester.

Public Information and Education Program

The existing Harbormaster Program should be reviewed and recommendations for enhanced public information and education shall be provided in terms of an ongoing program reflecting recommended management strategies of the Recreation Management Plan.

Action Program

All recommendations in Phase One and tasks completed in Phase Two shall be reviewed and prioritized into one plan for action. This task shall identify the steps that are necessary for successful implementation. The components include a schedule for implementation, identification of the roles of relevant boards, commissions, agencies and department, cost implications of the recommendations, and review of available and potential funding sources. A refinement of the Implementation proposed in Phase One of the Recreation Management Plan.

Economic Analysis

Cost Estimates for Management Strategies

Cost estimates were developed for those management strategies for which capital would be required.

Boating Conflicts and Safety Concerns

- 1a. **Posters of Boating Rules:** this is estimated to cost around \$1,000 per boating season. This includes the cost of poster design, production, and reproduction, as well as labor involved in distribution.
- 1b. **Handouts of Boating Rules:** the Police Department used to provide 2-3 page pamphlets summarizing boating rules at an annual cost of around \$500. This service has been deleted in budget cuts. (Mike Cannon, Harbormaster).
- 1c. & d. **Advertising of Boating Rules:** one 5" x 5" advertisement in the Colchester Chronicle runs around \$85. Running such an ad once per week for a 16-week boating season would amount to \$1,350. Add another \$500 for administration and design. Vermont ETV does not do any advertising or public service announcements, but do have advertising in their program guide. A 1/12 page ad in their program guide would cost \$140 per month for the 3 month boating season, or \$420.
- 1e. **Harbormaster Presentation:** currently the harbormaster conducts an 8 hour boating safety class 3 or 4 times per year. The estimated cost of the class for instructor and materials \$1,000. (Mike Cannon, Harbormaster).
- 1g. **Malletts Bay Watch Program:** currently the Colchester Police Department receives dozens of calls per week of complaints of illegal or nuisance activity on Malletts Bay. According to Mike Cannon, Harbormaster, there is no way, under current staffing, to respond to all of the requests. Thus, to have an effective program as described would require a new position within the Police Department. This is estimated to cost around \$20,000-\$25,000 for the season.
- 2a. **Temporary Installation of Navigational Buoys in Narrows:** for a 2000' buoy "lane" marking egress and ingress from the Inner Bay, 20 teardrop buoys would be needed. Full assembly and installation with mushroom anchors would cost \$7,000 if contracted out. Removal at the end of the season would cost around \$1,000. (estimate from the Dock Doctor of Ferrisburg, VT.)
- 4d. **Establish an Area for Personal Watercraft Stunt Riding:** According to the Harbormaster, this need not cost anything. The area may not require delineation with buoys if it is properly publicized. If buoy delineation were necessary, this is estimated to cost around \$6,500 per season. This consists of \$2,000 for information and publicity/outreach; \$2,000 for buoys to delineate area; and \$2,500 per season in labor costs associated with installation and removal. The proposed area for this activity in the north Bay is an area already frequented by the Harbormaster, so no additional personnel costs are envisioned.

Perceived Crowding

- 1a. **Posters Informing of Busiest Times of Use:** this is estimated to cost around \$1,000 per season for design, production, and distribution.
- 1b. **Inform Public About Schedule of Special Boating Events on Malletts Bay:** this is estimated to cost around \$750 per year for design, production, and distribution.
6. **Explore Potential to Dredge Sandbar:** this would be accomplished through a feasibility study which would be a precursor to State and Federal permit applications. Depending on the scope of the proposed dredging project, a feasibility study could cost anywhere from \$25,000 to \$125,000 (Mike Adams, Mark Merriell, U.S. Army Corps of Engineers).

Public Access

- 1b. **Improvements to Existing Public Access:** it would cost approximately \$25,000 to install vault toilets on the existing public access land. A wash-down facility would cost from \$20,000 to \$50,000 depending on the size and design (some designs call for heated water and holding/filtering tanks that need to be maintained). Existing designs for improvements to the upper and lower parking areas would cost between \$50,000 and \$75,000. This would pay for restriping the lower lot, and for grading, landscaping, and parking delineation of upper lot (no paving recommended by John Guilmette of ANR).
- 1c. **Install Directional Signage for All Public Access Points to Malletts Bay** \$XXX.XX.
- 1d. **Post Maps Informing of Boats Accommodated by Each Access Area:** this is estimated to cost around \$1,000 per season.
- 1e. **Develop New Public Access Area:** complete infrastructure for a new public access area includes a double-wide ramp, a 50' floating dock, parking area, and restrooms. This costs anywhere from \$125,000-\$225,000. Land acquisition costs vary widely. Could expect to pay anywhere from \$150,000 to over \$1 million for a few acres. (John Guilmette, ANR).
- 1f. **Develop Cartop Boat Access on Northern Shore of Inner Bay:** this is estimated to cost \$50,000-\$85,000 depending on the difficulty of access from shore. (John Guilmette, ANR).
2. **Develop Public Dock, Public Restroom, and Pedestrian Access to Stores, Restaurants, Etc., from Bay to Lane:** public dock is estimated to cost \$6,000 to construct, install, and remove each year (savings of up to \$2,000 if volunteers are used); \$25,000 for double stall vault toilet; pedestrian access costs are unknown - could be zero if access is developed over public land, or could be expensive if rights-of-way need to be acquired. (John Guilmette, ANR).
- 2b. **Public dock at Malletts Bay State Park:** this is estimated to cost around \$6,000 for full installation, construction, and removal. This would cost around \$2,000 for just the installation and removal. (Dock Doctor, Ferrisburg, VT).
- 2c. **Public dock at Bayside Park:** this is estimated to cost around \$6,000 for full installation, construction, and removal. This would cost around \$2,000 for just the installation and removal. (Dock Doctor, Ferrisburg, VT).
- 3a. **New Shoreline Access at Thayers Beach:** the Rosetti property has been mentioned as a candidate parcel for a new access point. The list price for this property is quoted at \$1.2 million (Andy Cochrane). The property is currently under contract. The Catholic church owns the other large undeveloped parcel in the Thayers Beach area and it is not currently for sale. No other parcels appear suitable due to the small parcels and extent of development in the area.
- 3b. **Feasibility Study for Improvements to Bayside Park:** this is estimated to cost \$5,000 (T.J. Boyle & Associates).
- 3c. **Construct Parking at Southern End of Causeway:** this is estimated to cost between \$40,000 and \$75,000 depending on the size of the lot and how nicely landscaped and "outfitted". (John Guilmette, ANR).
- 3d. **Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island:** fishing pier is estimated to cost around \$10,000 (permanent pier; a 1,000' boardwalk could cost around \$XX.XX per foot for a total of \$XX.XX).
- 2d. & 3g. **Incentives to Commercial Shorefront Property Owners:** this could be provided through changes in zoning and/or subdivision ordinances that would permit a relaxing of setback provisions, increased moorings, increased docksize, etc. If public access were to be permitted over private land. (Tom Berry, Colchester Town Planner).

Cultural Heritage Resources and Tourism and Hospitality Facilities

3. **Malletts Bay Brochure:** this is estimated to cost around \$10,000 for several thousand copies of a 4 color brochure. This includes design and assembly of information.
4. **Organize Bayside Events.**
5. **Establish a Bike Route Through Malletts Bay Area.**

Water Quality and Aquatic Nuisances

1. **Continue Water Quality Monitoring Program:** this currently costs the Town of Colchester \$10,000 per year. (Tom Berry, Colchester Town Planner).
2. **Public Education on Regulations Against Dumping:** this is estimated to cost around \$2,000 per year for publicity and programming.
3. **Increase Coast Guard Courtesy Inspections.**
5. **Pump Out Facilities at Marinas:** costs for these facilities vary widely. Champlain Marina invested \$37,000 for their facility 8 years ago. Depending on the complexity of the system (pumping height and distance) systems cost between \$20,000 and \$45,000. (Champlain Marina).
6. **Public Education Pamphlets to Shorefront Owners on Best Management Practices:** this is estimated to cost around \$1,500 per season for pamphlet design, production, and distribution.
7. **Establish a Malletts Bay Aquatic Nuisance Coordinator Pilot Project:** this is estimated to cost around \$8,000 for a summer. This is based on the cost of the water quality position, but does not include any paid laboratory work.

Fish, Wildlife, and Wetlands

1. **Identify Conservation Water Management Zones.**
2. **Comprehensive Bay-Wide Study of Critical Habitats:** a study to compile existing information on critical habitats on Malletts Bay, and to field inspect the Bay is estimated to cost around \$3,500 (Bill Countryman).
3. **Establish Indicator Species Monitoring Program within High School Curricula:** this could fit well within the existing Lake Champlain interdisciplinary course at the High School. The cost of it would depend on whether any outside laboratory analysis would need to be hired. Even with outside lab fees and boat rental, the cost would not be more than \$1,000 per year. (Bill Ramond, science teacher, Colchester High School.)
7. **Annual Shoreland Revegetation Event:** this is estimated to cost around \$1,100 per event, based on a similar event for owners of Connecticut River frontage held by the Grafton County Conservation District.

Marinas, Moorings, Docks, and Anchorages

3. **Establish Dense Mooring Field Layout:** the design of a dense mooring field is estimated to cost around \$2,500. (David Boehm, P.E.).

Economic Benefits for Management Strategies

To estimate the potential economic benefits of the Recreation Plan Management Plan, a modified Delphi approach was utilized. In this approach, experts and opinion leaders are canvassed for their opinions, and the resulting opinions are averaged to derive a "best estimate" of impact. This approach was used since the details of each management strategy have not been fully defined, and thus the impacts are largely hypothetical. The approach proves useful, however, in pointing to consensus about the general direction of an anticipated economic impact: negative, neutral, or positive; if negative or positive, to what degree?

For each strategy, the following elements of impact benefit have been evaluated:

- visitor days
- overnight stays
- visitor food and beverage expenditures
- visitor fishing tackle and bait expenditure
- visitor miscellaneous expenditures
- local property tax revenues

The scale shown in Table 10 was used by the participants in evaluating the management strategies.

Table 10: Benefit Scale.

Economic Impact Description	Scale Rating
Extremely Positive Economic Impact	+ 5
Strongly Positive Economic Impact	+ 3
Moderately Positive Economic Impact	+ 1
Neutral or No Economic Impact; Not Possible to Evaluate	0
Moderately Negative Economic Impact	- 1
Strongly Negative Economic Impact	- 3
Extremely Negative Economic Impact	- 5

When evaluating each management strategy for each impact element, the participants were instructed to consider only the anticipated effects implementing the strategy would have, and to ignore the costs of implementing the strategy since these have been directly estimated.

Four people responded to the survey: Tom Berry, Lee Rascoe, Jane Sorenen (T.J. Boyle), and Robert Chamberlin (Resource Systems Group).

This memo will first analyze the responses by impact element, and then provide a listing of the management strategies with the average benefit impact.

Impacts on Visitor Days

Table 11: Top Six Management Strategies for Increasing Visitor Days near Malletts Bay.
Management Strategy **Average Benefit Points**

Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island	3
Organize Bayside Events	3
Develop New Public Access Area	2.75
Develop Public Dock, Restroom, and Pedestrian Access to Stores, Restaurants, Etc. from Bay to Land	2.25
New Shoreline Access at Thayers Beach	2.25
Incentives to Commercial Shorefront Property Owners	2.25

Impacts on Overnight Stays

Table 12: Top Seven Management Strategies for Increasing Overnight Stays near Malletts Bay.

Management Strategy	Average Benefit Points
Develop Public Dock, Restroom, and Pedestrian Access to Stores Restaurants, Etc. from Bay to Land	3.25
Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island	2.75
Incentives to Commercial Shorefront Property Owners	2.25
Organize Bayside Events	2.25
Develop New Public Access Area	1.75
Public Dock at Bayside Park	1.75
Malletts Bay Brochure	1.75

Impacts on Visitor Food and Beverage Expenditures

Table 13: Top Five Management Strategies for Increasing Visitor Food and Beverage Expenditures in the Malletts Bay Area.

Management Strategy	Average Benefit Points
Develop Public Dock, Restroom, and Pedestrian Access to Stores Restaurants, Etc. from Bay to Land	4
Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island	3.5
Organize Bayside Events	3
Develop New Public Access Area	2.75
New Shoreline Access at Thayers Beach	2.5

Impacts on Visitor Fishing, Tackle, and Bait Expenditures

Table 14: Top Six Management Strategies for Increasing Visitor Fishing, Tackle, and Bait Expenditures in the Malletts Bay Area.

Management Strategy	Average Benefit Points
Develop Public Dock, Restroom, and Pedestrian Access to Stores, Restaurants, Etc. from Bay to Land	3.5
Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island	3
Develop New Public Access Area	2.75
Organize Bayside Events	2.5
Develop Car-Top Boat Launch on Northern Shore of Inner Bay	2.25
Incentives to Commercial Shorefront Property Owners	2.25

Impacts on Visitor Miscellaneous Expenditures

Table 15: Top Six Management Strategies for Increasing Visitor Miscellaneous Expenditures in the Malletts Bay Area.

Management Strategy	Average Benefit Points
Develop Public Dock, Restroom, and Pedestrian Access to Stores, Restaurants, Etc. from Bay to Land	4
Construct a Boardwalk, Fishing Pier, and Public Viewing Area Between Bayside Park and Coates Island	3.5
Organize Bayside Events	3
Develop New Public Access Area	2.75
Public Dock at Bayside Park	2.25
Incentives to Commercial Shorefront Property Owners	2.25

Management Strategy	Average Benefit Points
1. Implementing Property Tax Incentives for Affordable Housing Development	85
2. Streamlining Permitting Processes for New Construction	78
3. Enhancing Property Assessment Accuracy and Transparency	72
4. Encouraging Mixed-Use Development and Transit-Oriented Development	68
5. Investing in Infrastructure Improvements to Attract Investment	65

Analysis of Economic Benefits

- Construct a boardwalk, fishing pier, and public viewing area between Bayside Park and Coates Island;
- Organize Bayside events;
- Develop public dock, restroom, and pedestrian access to stores, restaurants, etc., from Bay to land; and,
- Develop new public access area.

Related to this is point three. Overall, very few recommendations were felt to have an identifiably strong positive impact. In 234 cases, only eleven times did the respondents feel that a ranking of 3 or greater was warranted.

Chapter Four: Policy Formation

Economic Analysis

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Appendices

Appendices

MOORING FIELDS
Malletts Bay Recreation Management Study
June 1995

REASONS TO CREATE MOORING FIELDS

- REDUCE SURFACE AREA OF MOORINGS
- IMPROVE & FACILITATE MANAGEMENT OF MOORINGS
 - PLACEMENT AND PERMITTING
 - INVENTORY OF MOORINGS AND BOATS
- ENCOURAGE SAFETY
- IMPROVE NAVIGATION
- REDUCE RECREATIONAL USE CONFLICTS
- IMPROVE VIEWS AND AESTHETICS

MOORING FIELD CRITERIA

Malletts Bay Recreation Management Study

June 1995

- REQUIRE SPACING TO MEET STANDARDS
 - (see accompanying "MOORING FIELD SPACING")
 - Scope (length of anchor line) to be based on ratio of $2.0 \times$ depth
 - Overlap - spacing based on $1.33 \times$ swing radius
 - Standards are similar to Malletts Bay Boat Club
- REQUIRE ANCHOR AND TACKLE CONSISTENT WITH SPACING STANDARDS
- LIMITS OF MOORING BOUNDARIES
 - 1,000 feet maximum from shore
 - 200 feet minimum from docks and shore structures
 - 200 foot fairways for through traffic
- CURRENT MOORING LAYOUT
 - 1992 mooring layout is shown on **Sketch 1** showing historic patterns
 - M.B.B.C.'s recently established mooring layout is **Sketch 2**
 - Together these approximate current usage
- TRANSITION FROM CURRENT MOORING LAYOUT
 - Start with 310 boat scheme in **Sketch 3**
 - Accommodates almost all current mooring allocations
 - Reduce allocation through negotiation with clubs/marinas/private
 - Reduce to current use and needs
 - Reduce outer limits of mooring fields accordingly
 - Require 25% reduction in moorings by conversion to dock space
 - Five year transition
 - Determine allocation of new docks by relative share of current dock/mooring ratios
 - Continue to reduce 1,000 foot limit as possible
 - Limits of **Sketch 4** should be a maximum field size

MOORING FIELD SPACING

Malletts Bay Recreation Management Study

June 1995

DETERMINING SPACING REQUIREMENTS:

Assume: Height of bow cleat or eyelet above water = 3 feet
 Input: Water depth = Mean low water + 5' to account for depth requirements in the Spring
 Choose scope ratio = ratio of anchor line length to (water depth + bow height)
 Boat length = vary from 28' to 58'
 Space Factor (SF) = the ratio of the spacing desired to the swing length
 Calc: Scope length = scope ratio X (water depth + bow height)
 Horizontal scope length = Sq. root of (scope length squared - depth+3' squared)
 Swing = hor. scope + boat length
 SPACING = swing X space factor

		MLW Depth	Extra depth			
Design Depth	10	5	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per acre
(feet)		(feet)	(feet)	(feet)	(feet)	
28		26	23	43	57	14
25		26	23	48	63	11
38		26	23	53	78	9
35		26	23	58	77	7
48		26	23	63	83	6
58		26	23	73	97	5

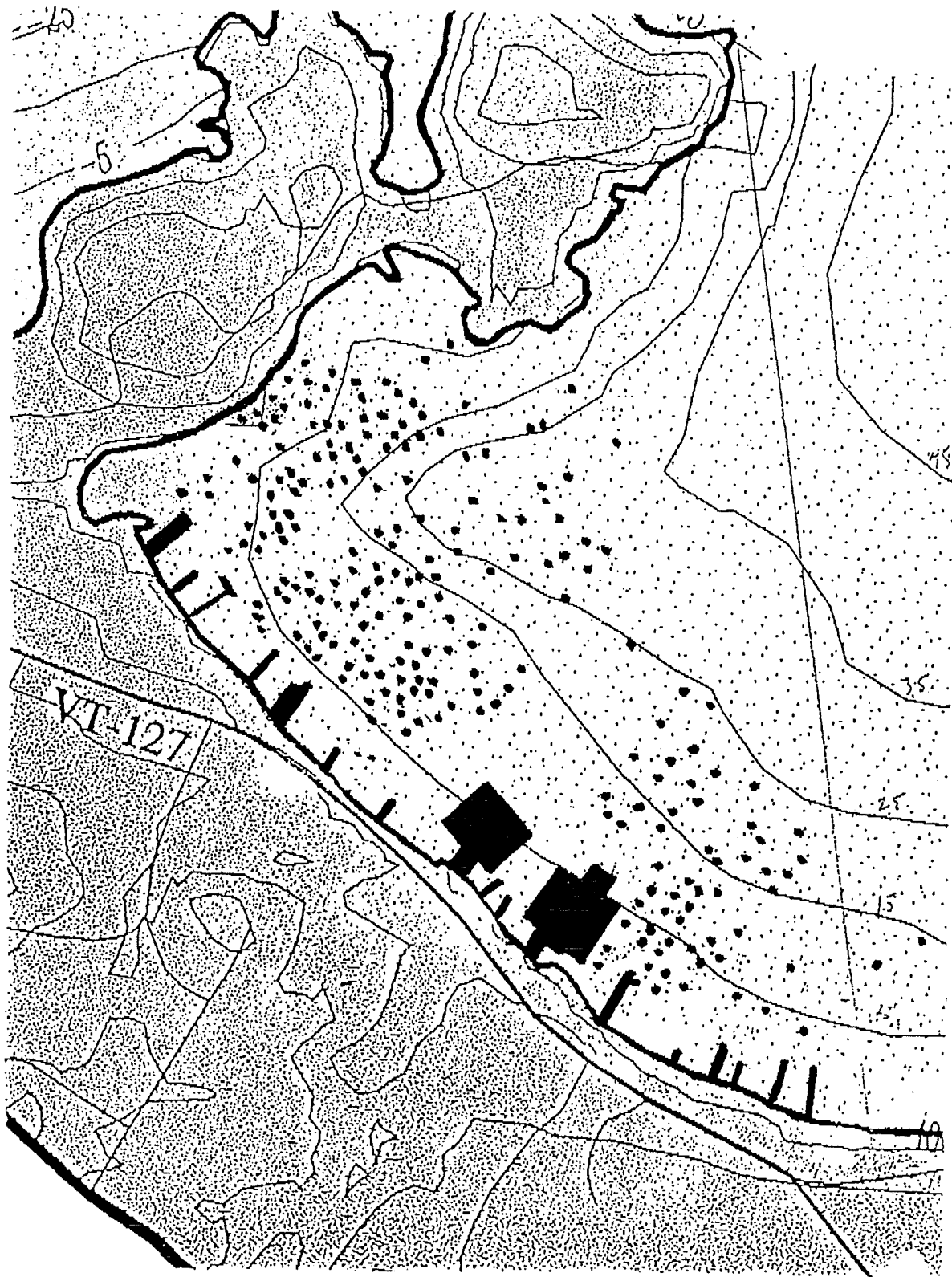
		MLW Depth	Extra depth			
Depth	15	18	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per acre
(feet)		(feet)	(feet)	(feet)	(feet)	
28		36	31	51	68	5
25		36	31	56	75	3
38		36	31	61	82	7
35		36	31	66	88	6
48		36	31	71	95	5
58		36	31	81	108	4

		MLW Depth	Extra depth			
Depth	20	15	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per acre
(feet)		(feet)	(feet)	(feet)	(feet)	
28		46	48	68	88	7
25		46	48	65	86	6
38		46	48	78	93	5
35		46	48	75	108	4
48		46	48	88	106	4
58		46	48	98	120	3

		MLW Depth	Extra depth			
Depth	25	28	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per
(feet)		(feet)	(feet)	(feet)	(feet)	acre
20		56	48	68	91	5
25		56	48	73	98	5
30		56	48	78	105	4
35		56	48	83	111	4
40		56	48	88	118	3
50		56	48	98	131	3

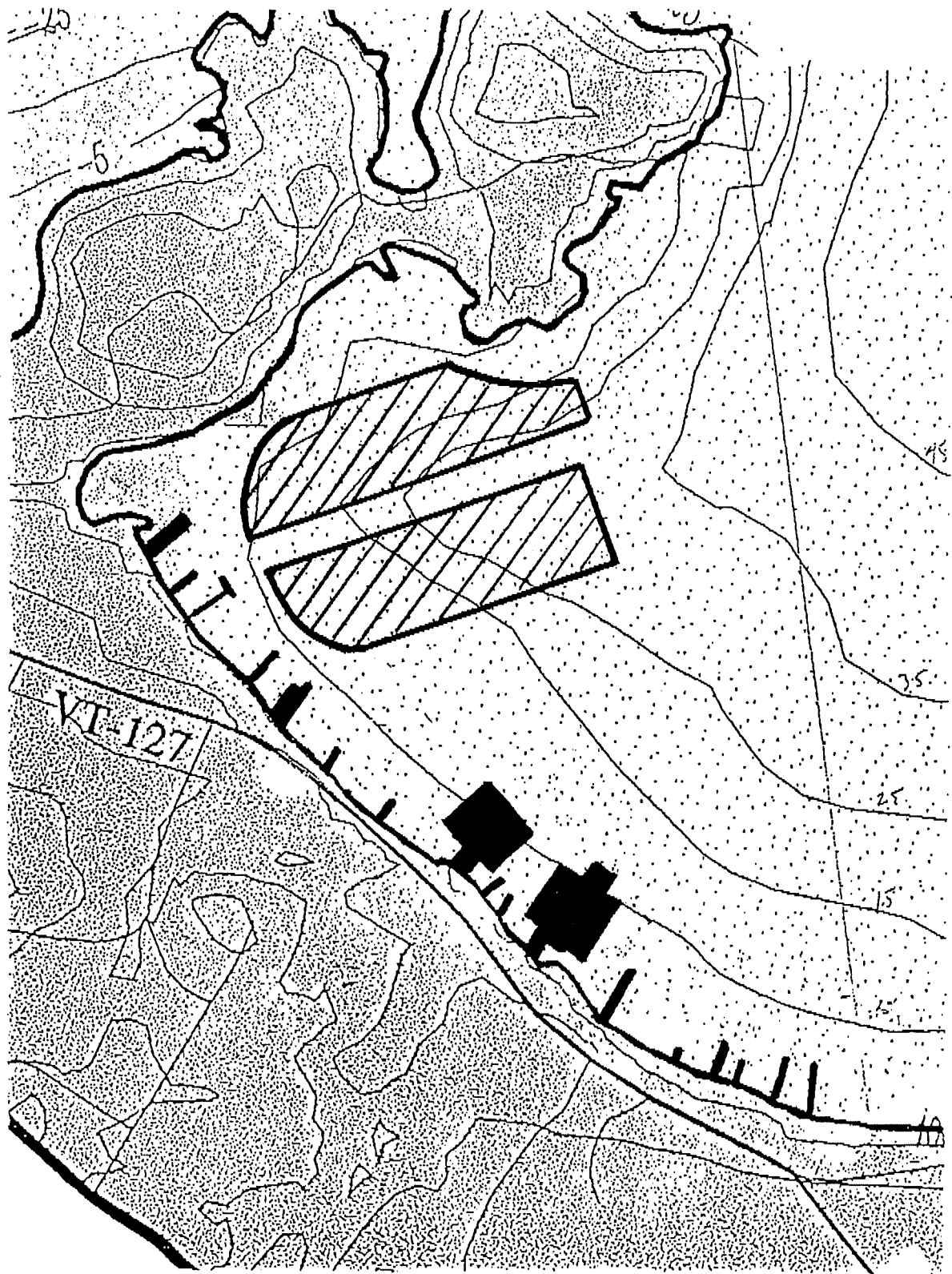
		MLW Depth	Extra depth			
Depth	20	25	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per
(feet)		(feet)	(feet)	(feet)	(feet)	acre
20		66	57	77	103	4
25		66	57	82	110	4
30		66	57	87	116	3
35		66	57	92	123	3
40		66	57	97	130	3
50		66	57	107	143	2

		MLW Depth	Extra depth			
Depth	35	38	5			
Scope Ratio	2.8					
Space Factor	1.33					
Boat Length		Scope Length	Hor. Scope	Swing	SPACING	Boats per
(feet)		(feet)	(feet)	(feet)	(feet)	acre
20		76	66	86	114	3
25		76	66	91	121	3
30		76	66	96	128	3
35		76	66	101	134	2
40		76	66	106	141	2
50		76	66	116	154	2



EAST OF COATES ISLAND
DOCKS & MOORINGS AS OF JULY 25, 1992
242 BOATS
Scale: 1" = 666'

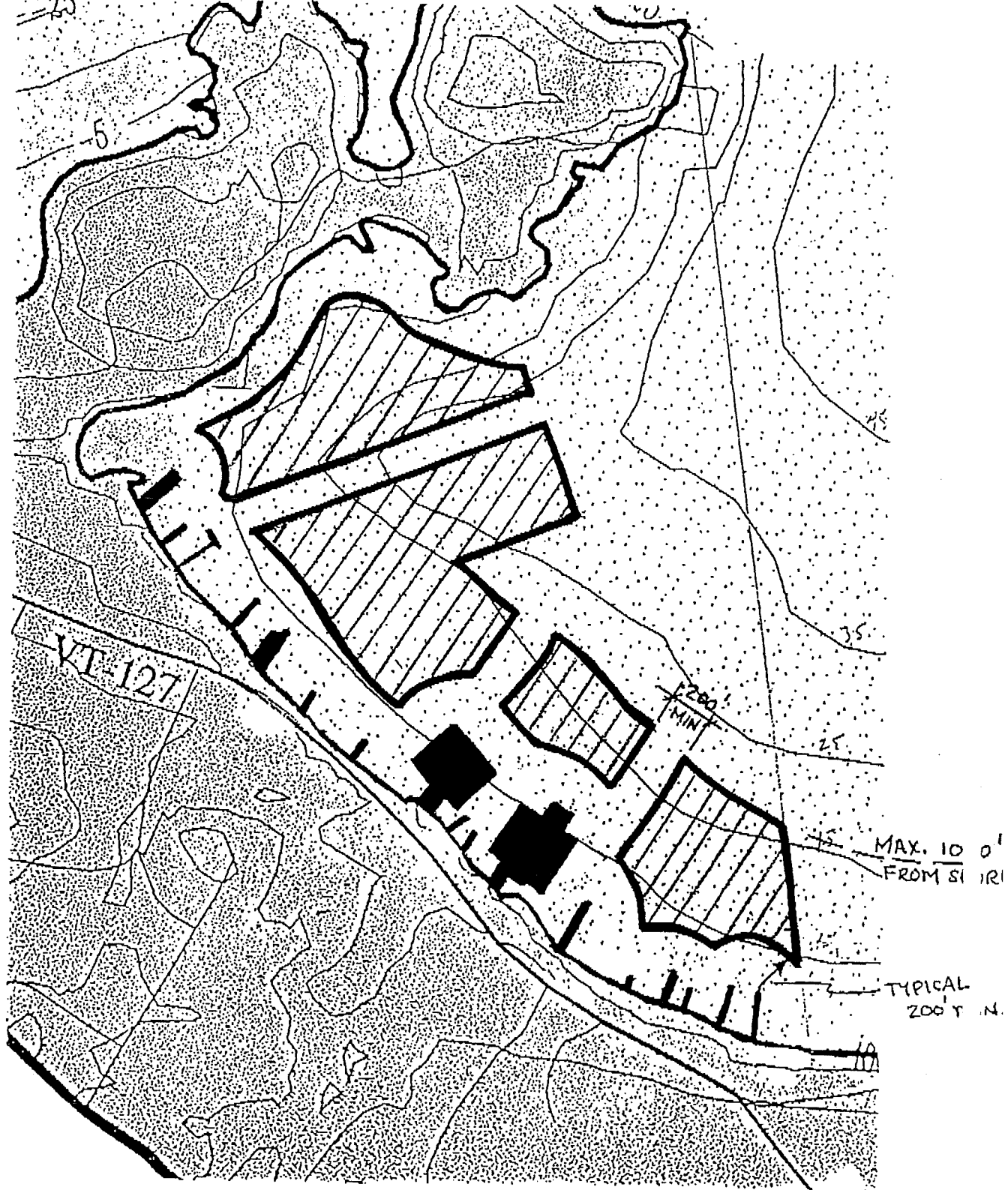
SKETCH 1



**EAST OF COATES ISLAND
MALLETTS BAY BOAT CLUB MOORING FIELD - 1995
176 MOORINGS**

Scale: 1" = 666'

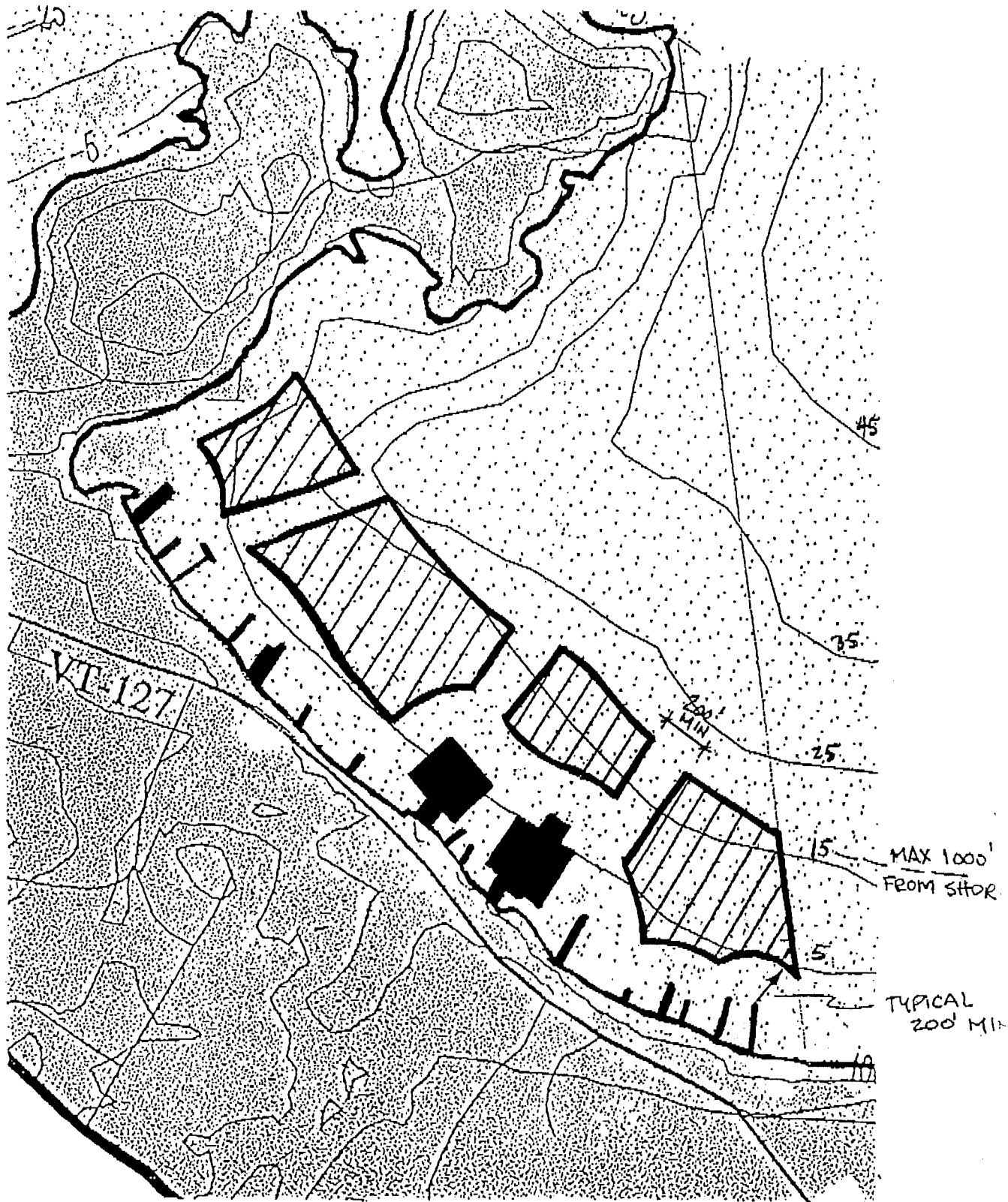
SKETCH 2



EAST OF COATES ISLAND
PROPOSED MOORING FIELD LAYOUT - SHORT TERM
310 BOATS

Scale: 1" = 666'

SKETCH 3



EAST OF COATES ISLAND
PROPOSED MOORING FIELD LAYOUT - LONG TERM
231 BOATS - MAXIMUM

Scale: 1" = 666'

SKETCH 4

Mooring Systems

Mooring systems for designated mooring areas will be chosen from a variety of system components that are available. Basically these systems should perform within the limits and guidelines of the spacing requirements in the mooring fields, as well as within established safety criteria.

Failure of any part of these systems can cause damage to both the moored boat and other boats and facilities in the Bay and along the shoreline. Responsibility for the final specification, placement, inspection, and maintenance of these systems should be carefully designated.

Systems have several standard components: anchor, rode (or line), float or marker, mooring lines, and connectors. There are many options for each. An important feature is how these moorings are managed in the off season.

ANCHORS

Anchor types vary for bottom conditions. Three general designs include anchors which grip the bottom, anchors which depend on dead weight and friction, and anchors which are driven or screwed into the lake bottom.

One of the most common anchors which is used locally for moorings is a mushroom anchor which develops its hold by digging into the bottom. The stem of the mushroom has a eyelet at the end for connections. This anchor can be relatively easily set and removed on a seasonal basis.

A common deadweight anchor is simply a concrete block with a stainless steel hook for attachment. These anchors depend primarily on dead weight and friction on the bottom although they gain some additional holding power by sinking into soft bottom conditions. Special bottom conditions are not required. Experience has led to wider, flatter blocks for more bottom area and less likelihood of tangling tackle. These anchors are left in the water with or without their mooring tackle attached during off season. These are considered permanent anchors although they can be lifted and reset if necessary.

Screw anchors are also available as permanent anchors. These require bottom conditions which will hold the screw. The holding power comes from the embedment of the anchor in the bottom. Attachment to an eyelet is similar to the above methods. These anchors can be retracted but are considered permanent when placed. Such anchors were installed in recent years at Malletts Bay Boat Club.

Sometimes more than one anchor should be made considering the bottom conditions and the need or desire to remove the anchors periodically.

RODE (line)

Anchor rode extends from the anchor to the float or buoy. Scope, or length of line, is discussed elsewhere in the report. Rope has been used for many years and is still popular for smaller, lighter boats. Various rope materials have been used. Rope is inexpensive and easy to use. The primary problem is that rope chafes and wears, and under poor conditions can deteriorate quickly. Light ropes often pull to full length during only moderate wind and provide no shock absorption. Nylon is preferred due to its ability to stretch and absorb shock. Short rubber snubbers can be used to provide additional cushion in the rode.

Steel chain offers a good choice. With a length of heavy chain directly above the anchor, the chain can prevent chafing around the anchor and can in effect become the anchor under light winds by lying on the bottom and taking up some of the total scope of the system. Lighter chain above to the buoy may then be used. While the chain can be unforgiving when extended in a full wind condition, its weight can provide some cushion when not fully extended.

A newer rode concept involves a 1 1/2" - 2" diameter solid rubber tube from the anchor to the buoy. This provides cushion and wearability and comes with integral eyelets in each end. This new product is being used increasingly.

FLOAT/MARKER

Proper floats are designed for three purposes - to support the rode, to provide a marker, and to allow the anchor rode to connect directly to the boat mooring lines. Ball type buoy choices are usually inflatable or rigid polyethylene or solid styrofoam. Another common system, which doesn't directly serve as a marker, is the Hazelett mooring, which is an aluminum tube filled with variable weights for flotation adjustment. Hazelett moorings should always have a visible marker attached.

Ball type buoys must be removed seasonally, while the Hazelett is designed to stay in place in the ice. Markers should be easily visible at any time a boat is not attached, for safety.

It is important that the rode connects through the float/marker in such a manner that the marker does not become a weak link in the system.

MOORING LINES

Above the buoy, the lines to the boat are often rope, and sometimes chain. In either case, chafing and wear at the deck or eyelet is very common and these lines should be backed up with a secondary line that only becomes taught if the first line breaks. Lines should also be protected through chocks by commonly used protective tubing or similar systems and should be well secured to cleats on the deck or to eyelets designed for such connections.

CONNECTORS

Connections should usually be made with heavy duty steel connectors, preferably with stainless steel. Swivels should be used at the anchor to rode connection, as well as above at the chain to chain, and rode to mooring line connections. All connecting shackles and connecting pins and bolts should be secured with stainless steel wire. Connections should be inspected regularly as the wear of these components can be substantial.

SEASONAL ISSUES

Off-seasonal maintenance of moorings is an issue. Many systems have been devised to allow removal and retrieval of anchor roads, some with more success than others.

Where the water areas will be used for late and early season fishing and for ice and snow uses such as snowmobiling, the moorings should be removed or dropped to the bottom on a seasonal basis, as a measure of safety. Considering the annual inspection and maintenance needs for most permanent mooring systems requires a scuba diver, the additional requirement to drop and recover anchor rode is an appropriate requirement. In addition to providing safety in off season, the removal or dropping of anchor lines prevents the displacement of anchoring systems during ice movement. These forces can be severe and can damage or move almost any system.

Appendices

CHOOSING A SYSTEM

Actual system requirements and maintenance requirements must be considered together. The stronger systems usually are more expensive but require less inspection and maintenance, and vice versa.

Anchoring choices can only be made when specific bottom conditions are known. rode, float, mooring line, and connector choices will be considered based on final scope and spacing requirements as well as on policies regarding initial cost, inspection, and maintenance.

In any case, the liability due to faulty systems or components should be considered, and implementation policies should be strictly enforced.

Appendix B: USER SURVEY AND MALLETT'S BAY AREA MAP

Malletts Bay Recreation Management Plan

HOW WAS YOUR DAY ON MALLETT'S BAY? This questionnaire is an effort to gather information about the quality of your boating experience on Malletts Bay. This information will be used by the Town of Colchester to develop a Recreation Management Plan for Malletts Bay.

Please take five minutes to complete this questionnaire. Your participation will help the Town determine where problems currently exist, where they may exist in the future, and what policies may help solve recreation problems. Your responses are confidential. Thank you for your interest and participation.

Q-1 What is the ZIP CODE of your permanent place of residence? _____

Q-2 What type of boat did you use today (if applicable, enter length and motor horsepower)?

<input type="checkbox"/> NON-MOTORIZED (CANOE, ROWBOAT, ETC.)	<input type="checkbox"/> SAILBOARD
<input type="checkbox"/> MOTOR/POWER BOAT: _____ FEET _____ HP	<input type="checkbox"/> JET SKI
<input type="checkbox"/> SAILBOAT: _____ FEET _____ HP	<input type="checkbox"/> OTHER _____

Q-3 How many people were on the boat, including yourself? _____

Q-4 What was the primary activity of your boating trip? (Check one)

<input type="checkbox"/> FISHING	<input type="checkbox"/> WATERSKIING	<input type="checkbox"/> NATURE ENJOYMENT/ SIGHTSEEING
<input type="checkbox"/> SWIMMING	<input type="checkbox"/> CANOEING/KAYAKING	<input type="checkbox"/> JET SKIING
<input type="checkbox"/> SAILING	<input type="checkbox"/> SNORKELING/SCUBA	<input type="checkbox"/> OTHER _____
<input type="checkbox"/> SAILBOARDING	<input type="checkbox"/> TOURING/CRUISING	

Q-5 Please enter the approximate times that your boat trip began and ended today:

BEGAN: _____	ENDED: _____
--------------	--------------

Questions 6-12 deal with the route of your boat trip today. Please refer to the Area Map to get the appropriate Area number for each question. Enter '0' if a question does not apply.

	AREA NUMBER(S)
Q-6: In which Area did your boating trip begin (if it began outside Malletts Bay, enter "11")?	
Q-7: If another boat access point were added to the Bay, in which Area would you want it to be located?	
Q-8: In chronological order, which Areas did you boat to today? (list all areas)	
Q-9: In which Area did you spend the most time?	
Q-10: In which Area did you have the best conditions for your primary activity?	
Q-11 Which Area was the most crowded?	

Q-12 Did you experience any conflicts or problems with other users of Malletts Bay (Check one):

☐ YES. IF YES, IN WHICH AREA DID YOU EXPERIENCE THE WORST PROBLEM? _____ ☐ NO

IF YES, briefly describe the worst problem you experienced in the Area entered above:

IF YES, what was the type of boat they were using? (Check one)

<input type="checkbox"/>	NON-MOTORIZED CANOE, KAYAK, OR ROWBOAT	<input type="checkbox"/>	MOTOR/POWER BOAT
<input type="checkbox"/>	SAILBOAT	<input type="checkbox"/>	JET SKI
<input type="checkbox"/>	SAILBOARD	<input type="checkbox"/>	OTHER _____

Q-13 On a scale from 1 to 9, with 1 representing extremely crowded and 9 representing "not at all crowded", how crowded did you feel while boating on Malletts Bay today?(Circle appropriate number)

1 2 3 4 5 6 7 8 9

Q-14 Indicate the amount and location of expenditures made for this boating trip. Answer all that apply.

	In Colchester/Malletts Bay	Outside of Colchester/Malletts Bay
Boating and Fishing Expenditures (incl. fishing tackle, parking, fees, gas & oil, repairs & parts, etc.)	\$ _____	\$ _____
Food and Lodging (incl. groceries, , ice, restaurant, hotel/motel, etc.)	\$ _____	\$ _____
Other/Miscellaneous	\$ _____	\$ _____

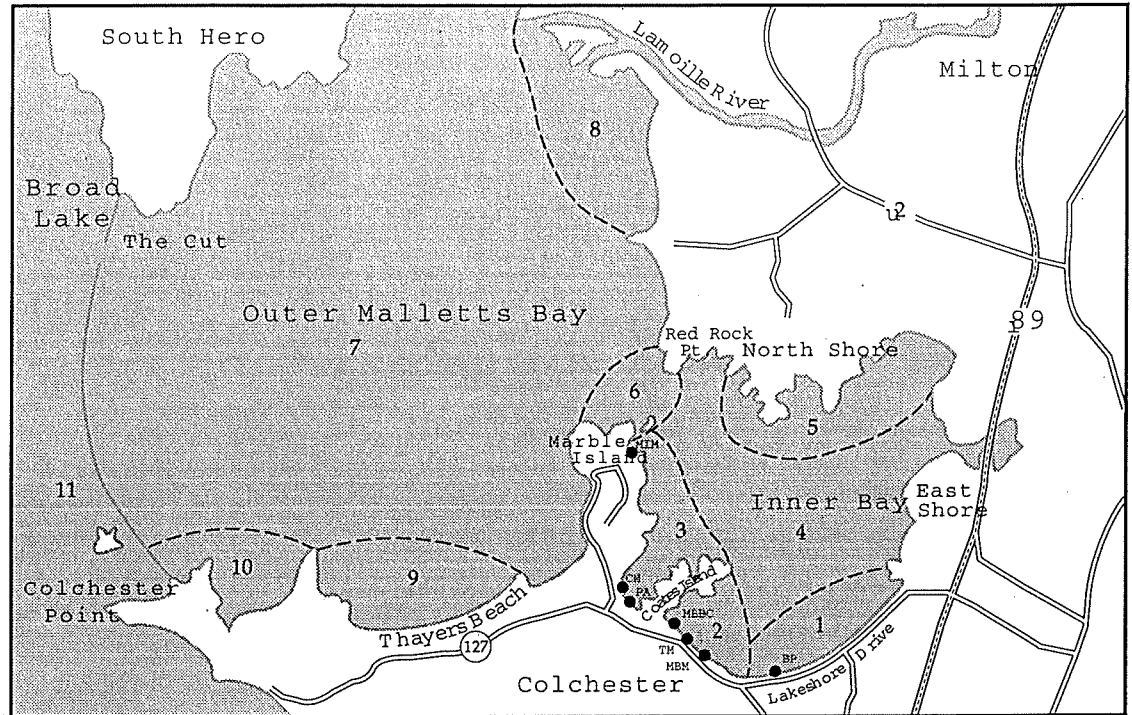
Q-15 Briefly describe the most and least appealing aspects of your boating trip today:

Most Appealing: _____

Least Appealing: _____

Q-16 Briefly describe any concerns or comments you have about recreational use of Malletts Bay: _____

Area Map of Malletts Bay



BP = Bayside Park CM = Champlain Marina MBBC = Malletts Bay Boat Club MBM = Malletts Bay Marina PA

Appendix C: OPEN-ENDED RESPONSES REGARDING USER CONFLICTS ON MALLETT'S BAY

POWERBOAT WAKES
WAVES COMING IN THE MARINA AT MARBLE ISLAND. IT'S TERRIBLE
ALMOST HAD A BOAT COLLISION
BOATERS WITH ZERO SKILLS, NO WAVE ZONES, NOT BEING FOLLOWED IN AREA 6
TERRIBLE WAKES AT LESS THAN 50 FEET WHEN YOU ARE TRYING TO FISH
FISHING ON THE DOCK, KIDS NOT PROPERLY WATCHED
MOTOR BOAT NOISE
LOADING & UNLOADING BOAT
DOCK IS CROWDED
WHILE FISHING A SHORELINE, HAVING WATER SKIERS SKI BETWEEN MY BOAT AND SHORE
TOO MUCH TRAFFIC
POWER BOAT WAKE - NO SLOWING TO PASS
MOTOR BOAT WAKES
POWER BOAT WAKES FROM ZONE 6 & 4 / SUGGEST - SPEED LIMIT TO MALLETT'S HEAD 6 MPH
FISHING BOAT ANCHORED IN CUT
SMALL MOTORBOAT ANCHORED IN THE CUT FISHING. SMALL MOTORBOATS AND JET SKIS LEAVING A WAKE WHERE BOATS ARE ANCHORED
JET SKIS
SEVERAL BOATS, CHOPPY WATERS, MOSTLY DUE TO MY INEXPERIENCE IN BOATING (NOT REALLY A MAJOR PROBLEM)
MALLETT'S BAY AREA CROWDED WHEN LAUNCHING AND RETURNING
POORLY MARKED MOORING OFFSHORE. OFTEN I HAVE ALMOST FOUND MOORINGS WELL OUTSIDE THE NO WAKE ZONE. THIS IS EXTREMELY HAZARDOUS
4 FOOT SEAS
SPEEDS OF POWER BOATS AND WAKE
LONG LINES
JET SKI
LARGE MOTOR BOAT EXCESSIVE SPEED WEEKENDS ARE WORSE
JET SKIS HATE JET SKIS
SOME JERK IN A 24 FT BOAT PASSED WITHIN 30 FT OF MY BOAT AT A HIGH SPEED, I WAS TROLLING AT 3 MPH. IT MAKES IT TOUGH FOR SMALL CRAFT WHEN LARGE CRAFT ARE INCONSIDERATE
WHILE WINDSURFING, A BOAT CAME WITHIN 8 FEET OF ME. I HAD TO MOVE OUT OF ITS WAY



JET SKI IN TOO CLOSE TO SHORE
SAILBOATS CUTTING ACROSS FISHING LINES
NON BOATERS PARKING IN LAUNCH RAMP
LARGE BOATS AT HIGH SPEED TOO CLOSE TO SMALL ANCHORED FISHING BOATS
JET SKIS TOO CLOSE TO ANCHORED VESSEL
JET SKIS - WAKES, NOISE
TOO MANY "CRAZY'S" IN CONTROL OF POWER BOATS
BOAT WAKES: HUGE
TOO MANY JET SKIS
CANADA BOAT HAVE NO COMMON SENSE
JET SKI NOISE
JET SKIS COMING VERY CLOSE & FAST-VERY LOUD AND ANNOYING
NO CANVAS REPLACE
NO WAKE VIOLATORS-LAMOILLE RIVER PEOPLE NOT WATCHING WHERE THEY ARE GOING
NO WAKE VIOLATIONS, VESSEL OPERATORS NOT PAYING ATTENTION TO US OR OTHER VESSEL
NO CONFLICTS WITH INDIVIDUALS BUT PROBLEMS CAUSED BY CONSTANT LARGE POWER BOATS WAKES AND NOISY JET SKIS
BOATERS LEAVING THE INNER BAY ARE NOT CAREFUL DRIVERS
BOATERS WITH POOR ETIQUETTE
JET SKIS AT HIGH SPEED NEAR THE SHORE. AS I WAS APPROACHING THE HARBOR/MOORING-DISREGARD FOR SEAMANSHIP
LACK OF SEAMANSHIP-ERRATIC HIGH SPEED BOATS CONVERGING & CAUSING HUGE WAKES
LARGE VERY LOUD HIGH SPEED POWER BOATS CAME VERY CLOSE TO MY SEA KAYAK
CAMP KINIYA-SKI BOAT DOES NOT STAY 200 FT AWAY FROM RAFTS & MOORINGS. CONSTANT ATTENTION IS REQUIRED TO AVOID AN ACCIDENT
SAFETY HAZARDS BY JET SKIS RENTAL IN AREA 1. RENTERS ARE MOST OFTEN YOUNG/INEXPERIENCED/INCONSIDERATE. THEY HUG SHORELINE CONSTANT ENGINE NOISE EVER-PRESENT. JET SKIS DON'T COME & GO, THEY STAY. THEY COME WITHIN 10 FT OF SWIMMERS. WHAT IS LEGAL DISTANCE
2 JET SKIS CROSSING OUR WAKE (COMING CLOSE TO US)
LARGE WAKES FROM LARGE & FAST MOVING BOATS
BOATS SPEEDING CLOSE TO SWIMMING AREA
EXCESS USE OF JET SKIS, PAIR OF BARKING DOGS, FREE RUN OF SEVERAL NEIGHBORS BEACHES BY KIDS ON JET SKIS



LACK OF CONSIDERATION IN AREA 10 EXCESSIVE SPEED 15/20 MPH WITH 30'/50' OF BEACH, LACK OF MOORING MARKERS
JET SKIING IN AND AROUND SWIMMERS & MOORED BOATS
AREAS 6 & 3 HARASSES BY JET SKIS. THERE IS NO EDUCATION PROGRAM TO TEACH RESPECT FOR OTHER BOATS AS PADDLE CRAFT
JET SKI ENCOUNTERS ROUTINE AND ALMOST ALWAYS A PROBLEM OR POTENTIAL PROBLEM
JET SKIS AT FULL SPEED WITHIN 100 FT OF OUR BOAT
POWER BOAT OPERATORS THAT DON'T KNOW PROPER NAUTICAL ETIQUETTE i.e. RIGHT OF WAY
HEAVY TRAFFIC AND WAKE ACTION
JET SKIS COME IN TOO CLOSE TO SWIMMING AREA
OTHER BOAT CUT ACROSS OUR BOW AT HIGH SPEED, LARGE WAKE NEARLY UPSETTING US
A BOAT IS MOORED 3-400 YDS NORTH OF THE END OF MILLS PT. SHOULD BE W/I 200 FT OF LAND. CAN'T SEE WELL AT NIGHT
CONGESTION
LACK OF CONSIDERATION FROM OTHERS BOATERS MOTOR BOATS COMING TOO CLOSE
LARGE MOTORIZED YACHTS AND HIGH POWER MOTOR BOATS WENT BY ME WHILE AT ANCHOR CAUSING HEAVY WAKES THAT ROCKED MY SMALL FISHING BOAT
HARASSED BY JET SKIERS
WATER SKIERS NOT STAYING SUFFICIENT DISTANCE FROM MOORED OR ANCHORED BOATS. ACTUALLY WAS USING MOORED BOAT TO TURN AROUND (WITH SKIER BEHIND)
PEOPLE GOING TOO FAST
IRRESPONSIBLE DRIVERS - CUTTING ACROSS THE BOW, SPEEDING
SPEEDING JET SKIS IN MARKED 5 MPH AREAS
2 JET SKIS CAME WITHIN 75 FT RUINING THE PEACE AND QUIET OF THE MORNING
JET SKIS COMING OUT OF MARBLE ISLAND USING POOR SEAMANSHIP



Appendix D: CATEGORIZED OPEN ENDED RESPONSES ON CONCERNS ABOUT
MALLETTS BAY

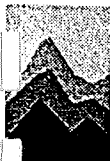
Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
✓								SAFE BOATING PRACTICES AND A BETTER HANDLE ON POLLUTION BY BOATS (OWNERS)
✓								TOO MANY SPEED BOATS GOING TOO FAST, TOO CLOSE TO SMALLER BOATS, OR FISHING BOATS AT ANCHOR
	✓	✓						TRAFFIC, WEEDS
								A SIGHTSEEING BOAT SIMILAR TO THE ETHAN ALLEN ON L. CHAMPLAIN WOULD BE NICE FOR RESIDENTS & VISITORS
	✓	✓						ON SOME WEEKENDS, AS MANY AS 35-40 LARGE BOATS, MANY FROM CANADA MOOR OFF THAYERS BEACH FOR THE WEEKEND, ONE WONDERS ABOUT HOLDING TANKS, POLLUTION ETC IN THIS BAY
		✓						WEEKENDS ARE FILLED WITH TOO MANY BOATS-HAVE CHANGED MY BOATING TO WEEKDAY EVENINGS WHEN THE BAY IS LESS CROWDED
✓						✓		ENFORCEMENT AND SAFETY ARE GOOD. THEY NEED TO BE MAINTAINED. MOORING REGULATIONS SHOULD BE UP TO TOWNS, NOT THE STATE
	✓							WATER QUALITY
				✓		✓		CONCERNS: LACK OF TOWN CONTROL OF RAFTS AND MOORINGS; WIDELY LOUD BOAT ENGINE NOISE
					✓			BOATS COME IN AND ANCHOR OFF SHORE IN FRONT OF OUR PRIVATE BEACH SO THERE IS LITTLE CHANCE FOR PRIVACY-VERY ANNOYING! SIGNS TO KEEP OFF IGNORED OR TORN DOWN FREQUENTLY
			✓	✓				I HAVE BEEN HARASSED BY JET SKIERS AND THEY ARE TOO NOISY
	✓							WEEDS, ALGAE
	✓							SEWAGE DRAINAGE (FROM CAMPS & BOATS)
	✓				✓			BOATERS ON PRIVATE PROPERTY; ASIAN MILFOIL AND OTHER WEEDS
✓	✓		✓	✓				BOATS DUMPING TANKS. NOISY JET SKIS. BOATS TOO FAST TOO CLOSE TO SHORE OR ANCHORED BOATS
✓			✓	✓				JET SKIS-NOISE, POOR SEAMANSHIP



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
			✓					JET SKIS SHOULD BE BANNED
				✓				EXCESSIVE NOISE FROM POWER BOATS, ESPECIALLY JET SKIS TYPE
				✓				WE ENJOY QUIET TIMES WHICH ARE SOMETIMES SPOILED BY NOISY CRAFT
✓				✓				POWER BOATS INCREASE POLLUTION IN SOUND. WAVES & SPEED SHOULD BE BANNED. OUT OF STATE BOATS SHOULD BE CHARGED PROPERTY TAX USE
			✓	✓				STOP THE NOISE POLLUTION FROM THE JET SKIS THEY ARE HORRIBLE - GIANT MOSQUITO NOISE AT 90 DECIBELS. THEY WOULD BE BANNED IN A WORK PLACE AS HAZARDOUS TO YOUR HEARING. WHY ALLOW THEM ON THE LAKE!
			✓	✓				WE ENJOY A QUIET RETREAT. NOISIER CRAFT, ESPECIALLY JET SKIS ARE VERY DISTURBING
	✓							TOO MANY SAILBOATS & CRUISERS STILL DUMPING IN THE BRAE LOCK BAY
		✓						THERE IS TOO MANY BOATS BEING ACCEPTED TO THE MARINA THERE AT THE BAY
✓	✓			✓				CIGARETTE BOATS & JET SKIS ARE OFFENSIVELY NOISY AND TRAVEL TOO FAST TO BE SAFE! SOMETHING HAS TO BE DONE ABOUT AQUATIC GROWTH i.e. MILFOIL
	✓					✓		CONCERN RE BOATERS COMING ONTO PRIVATE PROPERTY (CLEARLY POSTED) TO JUMP FROM CLIFFS, SWIM FROM RAFT OR WALK DOGS. WATER PURITY AN OCCASIONAL CONCERN BECAUSE OF BOATS DUMPING



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
	✓		✓	✓				JET SKI NOISE, POLLUTION BY OIL ENGINE COOLANT & HUMAN WASTE
				✓		✓		MOORINGS AND RAFTS CAN BE PLACED ANYWHERE BY ANYONE; AND POORLY MUFFLED POWER BOATS LEADING TO LOUD ENGINE NOISE
	✓							WEED AND ALGAE NEAR MOUTH OF MALLETT'S CREEK WEEDS HAVE GROWN WORSE EACH YEAR. NO FUN TO TRY AND SWIM WITH ALGAE AROUND YOUR NECK
✓				✓				THE VERY LOUD HIGH SPEED POWER BOATS THAT TRAVEL SHOW NO CONCERN FOR PADDLE CRAFT
	✓							A CHANNEL THROUGH THE SANDBAR BRIDGE SHOULD BE DREDGED. WATER PURITY TESTING SHOULD BE DONE BY ZONE AND THE RESULTS PUBLISHED
✓	✓		✓	✓				BOATERS DUMPING SEWAGE INTO LAKE. EXCESSIVE BOAT SPEED TOO CLOSE TO SHORE. NOISY JET SKIS
	✓							DUMPING OF HOLDING TANKS, THROWING OF GARBAGE OVERBOARD, INCREASE IN UNDESIRABLE WEED GROWTH
	✓				✓			WATER QUALITY IS A CONCERN, ALSO PUBLIC ACCESS
✓			✓	✓				LEVEL OF NOISE WITH POWERBOATS & JET SKIS AS WELL AS SPEED (TOO FAST)
✓		✓	✓					TOO MANY BOATS & JET SKIS ABOVE SPEED LIMIT TOO CLOSE TO SHORE
✓			✓					JET SKI & SUCH NOT KNOWING OR IGNORING THE SPEED LIMITS AROUND OTHER BOATS OR WITHIN 200 FT OF SHORE
✓								MOTOR BOATS & WATER SKIING - CLOSE TO SHORE & (SPEED) NON OWNER USE OF MOORING & ANCHORING - CLOSE TO SHORE
			✓					JET SKIS ARE VERY ANNOYING!
					✓			TOO MANY CANADIANS MOORING RIGHT OFF SHORE & OFTEN USING THE SHORE FOR SANITARY DISPOSAL



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
			✓	✓				JET SKIS CONTRIBUTE NOISE POLLUTION & SAFETY HAZARDS
✓				✓				EARLY MORN BASS FISHING. NOISY BOATS & FISHERMAN TOO CLOSE TO SHORE & CAMP. LARGE BOATS NOT FOLLOWING THE RULES i.e. EXCESSIVE SPEED & WAKE AROUND SMALL BOATS. RECOMMEND SPEED, NOISE, AND WAKE BE CONTROLLED AND ENFORCED.
✓	✓				✓			TOO MANY USING SHORE TO TIE UP. BLOCKS PASSAGE ALONG SHORELINE. MOTORBOATS TRAVELING TOO FAST CLOSE TO SHORE. FLUSHING OF TANKS AS LEAVING
			✓					I'D HATE TO SEE MANY MORE JET SKIS
		✓						GETTING MORE CONGESTED
		✓						INNER BAY IS OFTEN VERY CONGESTED
			✓	✓				INCREASED NOISE -JET SKIS & POWER BOATS
	✓	✓						MANY PEOPLE USE THE BAY, BUT LEAVE THEIR GARBAGE BEHIND!
						✓		COMMERCIAL MOORING ARE GETTING OUT OF CONTROL
							✓	DREDGE SANDBAR SO BOATS CAN GO UNDER BRIDGE & GET TO SAND BAR BEACH
	✓							I WOULD LIKE TO SEE THE "POTTY" PATROL ON DUTY AT THAYERS BAY DURING THE WEEK
					✓			KEEP MALLETT'S BAY OPEN FOR ALL USES, BOTH RESIDENT AND NON RESIDENT
							✓	I CONSIDER IT EXCELLENT
✓								BIG POWER BOATS CREATING WAKES AT FULL SPEED - INCONSIDERATE - LACK OF KNOWLEDGE OF BOATING ETIQUETTE & SAFETY
	✓							PARKING ENVIRONMENTAL ISSUES. I FEEL USE OF THE BAY ADVANTAGEOUS PROVIDING SAFETY IS ASSURED - THESE PAST 31 YEARS HAVE NOTICED INCREASED USE BUT ALSO CARE AND CONSIDERATION OF OTHERS
	✓	✓	✓					POSSIBLE POLLUTION FROM LARGE MOORED GROUPS, JET SKIS ARE HAZARD TO BATHERS. THIS EVENING THERE WERE 47 MOORED BOATS AT SPAULDINGS WEST.
					✓			NEIGHBOR STEALS MY FLOATING BALLS REMOVED MY RADIATOR AS AN ANCHOR SUB LEASERS LETS SOMEONE USE MY MOORING A MESS!
			✓			✓		LACK OF CONTROL OF JET SKIS



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
						✓		MOORINGS & MAKING RULES FOR ALL OF COLCHESTER LAKE FRONT DOESN'T MAKE SENSE!
	✓	✓						WATER QUALITY, CROWDING IN SOME MOORING AREAS, WASTE DISCHARGE FROM TRANSIENT VESSELS
			✓					I'D HATE TO SEE MANY MORE JET SKIS
	✓							WEEDS AND ALGAE
				✓				NOISY CRAFT CREATE A NUISANCE
							✓	NONE
			✓					JET SKIS THEIR EFFECT ON PADDLE CRAFT BIRD & WILDLIFE
✓								BOATS (CAMI KINIYA MOTORBOATS & CANOES) HAVE COME TOO CLOSE TO OUR RAFT. THE CANOES HAVE ACTUALLY HIT SOME OF OUR GUESTS
				✓				NOISE POLLUTION
					✓			CONCERN RE BOATERS COMING ONTO PRIVATE PROPERTY TO JUMP FROM CLIFFS OR WALK DOGS. DUMPING AN OCCASIONAL PROBLEM
	✓				✓			WATER QUALITY IS A MAJOR CONCERN, ALSO PUBLIC ACCESS
			✓					FINES FOR JET SKI/WATER BIKE VIOLATIONS NEED TO BE HIGHER AS THEY ARE NOT A DETERRENT i.e. JET SKIS AT FULL SPEED UP MALLETT'S CREEK
	✓		✓	✓				NOISE POLLUTION BY JET SKIS ETC., OIL POLLUTION (ENGINE COOLANT) & HUMAN WASTE POLLUTION
					✓			TOO MANY CANADIANS ANCHORING RIGHT OFF SHORE & USING THE SHORE LINE FOR A LATRINE
			✓	✓				JET SKI NOISE
	✓							DUMPING OF HOLDING TANKS, THROWING OF GARBAGE OVERBOARD, INCREASE IN UNDESIRABLE WEED GROWTH
							✓	OVERNIGHT VISITORS ANCHORING TOO CLOSE TO SHORE
			✓		✓			JET SKIS SUCK. INCONSIDERATE EARLY FISHERMAN COMING VERY CLOSE TO SHORE
	✓	✓						THE OILY SLICK ON WATER OBTAINED FROM THE BAY IS AN INDICATOR OF POLLUTION FROM TOO MANY MOTORIZED VESSELS. RECOMMEND THE WHOLE BAY OR THE RESIDENTIAL AREAS NOT BE ALLOWED GASOLINE ENGINES
							✓	HOME OWNERSHIP SHOULD HAVE FIRST CHOICE OF

Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
✓	✓		✓					THERE ARE SOME BIRD HABITATS (HERONS, DUCKS, MERGANSERS) THAT SHOULD BE RESTRICTED BY BOAT - JET SKIS!!! MAYBE CERTAIN FOOTAGE SHOULD BE DETERMINED
✓								THERE ARE TOO MANY INEXPERIENCED BOATERS
		✓						GETTING CROWDED
✓								LACK OF ETIQUETTE ON BEHALF OF POWER BOATERS
			✓					MODIFY USE OF JET SKIS!!
	✓							PEOPLE LEAVING GARBAGE IN WATER AND ON BEACH
						✓		IT'S WAY OVERDUE, MALLETTS BAY DESPERATELY NEEDS RECREATIONAL ACTIVITIES DURING THE SUMMER MONTHS, IT WOULD HELP TOURISM
		✓						BOAT TRAFFIC IN AND OUT OF SPAULDING BAY ACCESS AREA
						✓		CONCERNED WITH OVER REGULATION BY NON BOATERS
			✓	✓				JET SKIS ARE A DREADFUL ANNOYANCE IN AREA 9. THEY ARE VERY NOISY & TIRESOME & USED MANY HOURS EVERY DAY JUST FOR KICKS
							✓	IT IS JUST PERFECT!!
		✓						TOO MANY MOORINGS
	✓				✓			PLEASURE BOATS ANCHORING FOR WEEKEND IN FRONT OF PROPERTY PEOPLE CONTINUE TO USE LAKE AND DUMPING CONCERNS
✓			✓					BOATS EXCEEDING 5 MPH OR MAKE A WAKE IN A NO WAKE ZONE, IET SKIS ALL OVER THE PLACE
							✓	I DO NOT SEE ANY PROBLEMS. MALLETTS BAY IS A GREAT PLACE TO BOAT AS LONG AS YOU ARE RESPONSIBLE
✓		✓						THE INNER BAY IS A ZOO OF INEXPERIENCED SPEED NUTS. I DON'T GO THERE, THEY DON'T OBEY THE RULES OF THE ROAD
		✓						CONGESTION
							✓	NONE
✓								ENFORCE REDUCE SPEEDS IN AREA 6 POWER BOATS
					✓			FEEL SHORE OWNERS WHO OWN PROPERTY & PAY HIGH TAXES SHOULD HAVE PREFERRED TREATMENT
✓								BOATS COME IN TOO CLOSE TO SHORE - CHILDREN SWIM THERE AND I DON'T WANT THEM LIT



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
			✓	✓				DO NOT LIKE NOISY JET SKIS
			✓	✓				JET SKIS ARE NOISY AND A NUISANCE
			✓	✓				EXCESSIVE NOISE FROM POWER BOATS, ESP THE JET SKIS TYPE
			✓					JET SKI BOATS SHOULD BE BANNED
				✓		✓		LACK OF TOWN CONTROL OF MOORINGS AND RAFTS; UNDULY LOUD BOAT AND ENGINE NOISE
	✓	✓				✓		EXCESSIVE BOATING INTERFERES WITH SWIMMING - FEAR TO USE ROW BOAT AND CANOES. ALSO THERE IS GASOLINE SCUM BY SHORE. BOATING NEEDS TO BE REGULATED
	✓							BOATERS ON OUR BEACH OR DOCKS, WEEDS LIKE ASIAN MILFOIL, GARBAGE DUMPED FROM BOATS
	✓							ALGAE, WEEDS
							✓	ON THE AVERAGE VERY LITTLE USE OF THE BAY MOST PEOPLE WITH BOATS HEAD OUT TO BROAD LAKE
	✓							THERE SEEMS TO BE MORE ALGAE THIS YEAR
	✓							SEWAGE DRAINAGE (CAMPS & BOATS)
					✓			THERE SHOULD BE MORE ACCESS FOR VISITORS TO THIS AREA - PICNIC - SHOPPING ET.
		✓	✓	✓				HATE THE SOUND OF JET SKIS - I DISLIKE HOW THE LARGE # OF POWER BOATS ANCHOR OFF THAYER'S BEACH! ALL WEEKEND EVERY WEEKEND
✓						✓		ENFORCEMENT AND SAFETY ARE GOOD. THEY NEED TO BE MAINTAINED. MOORING REGULATIONS SHOULD BE UP TO TOWNS NOT THE STATE!
			✓					AREAS 9&10 SOMETIMES 3 JET SKIS COMPETING & CONTORTING WITH EACH OTHER. RARELY IS THERE A DAY THAT ONE JET SKIER IS NOT OUT GUNNING HIS MACHINE FOR HOURS. EXTREMELY ANNOYING
		✓						OVER CROWDED
	✓							WATER QUALITY
	✓	✓						TOO CROWDED, WEEDS ARE BECOMING A PROBLEM
						✓		COAST GUARD AND STATE POLICE "SAFETY CHECKS" WITH NO PROBABLE CAUSE ARE A HUGE NUISANCE AND SHOULD BE STOPPED
✓	✓							SAFE BOATING PRACTICES AND A BETTER HANDLE ON POLLUTION BY BOATS (OWNERS)



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
							✓	WE JUST LIVE HERE
✓			✓	✓				NEED TO REGULATE USAGE OF JET SKIS FOR NOISE AND SAFETY NEAR SWIMMING AND RESIDENTIAL AREAS
	✓		✓					WATER QUALITY - JET SKI & WATER SKIERS AMONG MOORED VESSELS
✓			✓					JET SKI OPERATORS SHOW NO RESPONSIBILITY WHEN USING THEIR MACHINES
						✓		GOOD HELP & CONTROL BY LOCAL/STATE POLICE. SHOULD BE ABLE TO CONTACT THEM DIRECTLY BY MARINE RADIO NOT VIA USCG!!
	✓							WATER QUALITY
	✓		✓	✓				INCREASE IN WEEDS IN INNER BAY - THOSE D... NOISY JET SKI TYPE THINGS!
				✓		✓		INADEQUATELY MUFFLED BOAT MOTORS; LACK OF TOWN CONTROL OF MOORINGS, RAFTS, ETC.
	✓							POLLUTION
	✓					✓		BOATERS ON OR TYING UP TO OUR PRIVATE PROPERTY; BEER BOTTLES AND WASTE DUMPED; SPREAD OF ASIAN MILFOIL AND OTHER WEEDS
			✓	✓				JET SKIS - NOISE POLLUTION - THEIR NOISE CAN RUIN THE ENJOYMENT OF THE BAY
	✓				✓			NOT ENOUGH MOORING SPACE FOR LANDOWNERS AROUND MALLETT'S BAY. I DON'T WANT PEOPLE I DON'T KNOW CROSSING MY LAND TO GET TO THEIR MOORINGS. POLLUTION FROM TOO MANY PEOPLE
						✓		NEED MORE PUBLIC ACCESS, BETTER POLICING
					✓			MORE CONCERN SHOULD BE SHOWN FOR THE WISHES OF THE LAKESHORE OWNERS - WHO PAY DEARLY FOR THE "PRIVILEGE"
	✓				✓			PUBLIC ACCESS AND WATER QUALITY
	✓	✓	✓					WATER QUALITY APPEARS TO BE A CONTINUING PROBLEM FROM BEACH FIELDS THAT HAVE FAILED /WEEKEND MOTORBOAT TRAFFIC IS HEAVY IN AREA 9 WITH JET SKIS, SAILBOARDING, WATER SKIING AND TUBING/BOARDING TAKING PLACE PLUS TRANSIENT MOORING FOR THE ENTIRE WEEKEND
							✓	OUR SECTION WELL MANAGED AND NOT CROWDED
✓			✓	✓				WE CONTINUE TO OBJECT TO THE NOISE OF JET SKIS & THEIR BEHAVIOR



Boating Etiquette/Safety/Speed	Environmental Conditions	Congestion/Crowding	Jet Skis	Noise	Public Access/Infringement on Private Property	Regulation	Other	Comment
					✓			BUOY ACCESS SHOULD NOT BE PERMITTED FROM PUBLIC BOAT ACCESS AREA.
					✓	✓		BETTER PUBLIC ACCESS; BETTER MORE POLICING
	✓		✓					WATER QUALITY - JET SKI & WATER SKIERS AMONG MOORED VESSELS
	✓				✓			PEOPLE TRESPASS ACROSS NEIGHBOR'S PROPERTY TO MAINTAIN BOAT & MOORING IN FRONT OF OUR COTTAGE. GLOBAL CONCERN - BOATS WITH TOILETS - ILLEGAL DISCHARGE
	✓				✓			WATER QUALITY & PUBLIC ACCESS
			✓	✓				JET SKIS ARE VERY NOISY IN OUR AREA (PORTERS POINT)
	✓				✓			BOATERS TYING UP TO OUR PRIVATE PROPERTY (CLEARLY MARKED) WASTE DUMPED; SPREAD OF ASIAN MILFOIL & OTHER WEEDS
	✓							ALGAE & WEEDS
				✓		✓		INADEQUATELY MUFFLED BOAT MOTORS, LACK OF TOWN CONTROL OVER MOORINGS, RAFTS, ETC.
			✓					BAN JET SKIERS!
			✓					BAN JET SKIS!

APPENDIX E: GENERAL ATTITUDE SURVEY

Hello, my name is _____, and I'm calling on behalf of the Town of Colchester. We're conducting a survey to assist the Town in developing a Recreation Plan for Malletts Bay on Lake Champlain. It will take approximately 3 minutes to conduct the survey. May I ask you a few questions? I want to assure you that your telephone number was chosen randomly, and all of your responses are completely confidential.

Q-1) What Town do you live in?

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> a) Burlington | <input type="checkbox"/> e) Essex |
| <input type="checkbox"/> b) Winooski | <input type="checkbox"/> f) Milton |
| <input type="checkbox"/> c) South Burlington | <input type="checkbox"/> g) Westford |
| <input type="checkbox"/> d) Colchester | <input type="checkbox"/> h) Williston |

Q-2) Have you heard of Malletts Bay on Lake Champlain?

- ☐ YES (GO TO Q-3)
☐ NO (if no, survey ends. Thank you.)

Q-3) Have you ever used Malletts Bay for recreation?

- ☐ YES (GO TO Q-4)
☐ NO (GO TO Q-3a)

Q-3a) Which of the following best describes why you have not used Malletts Bay for recreation?

- ☐ a) Malletts Bay is not convenient/there is poor Vermont Fish & Wildlife Public Access Area.
☐ b) Malletts Bay is too crowded.
☐ c) I prefer to recreate elsewhere.
☐ d) Other (briefly describe) (GO TO Q-7)

Q-4) What is the primary activity you engage in when you go to Malletts Bay?

- | | | |
|--|--|---|
| <input type="checkbox"/> a) fishing | <input type="checkbox"/> e) water-skiing | <input type="checkbox"/> i) canoeing/kayaking |
| <input type="checkbox"/> b) swimming | <input type="checkbox"/> f) touring | <input type="checkbox"/> j) snowmobiling |
| <input type="checkbox"/> c) sailing | <input type="checkbox"/> g) sightseeing | <input type="checkbox"/> k) ice fishing |
| <input type="checkbox"/> d) sailboarding | <input type="checkbox"/> h) jet skiing | <input type="checkbox"/> l) other |

Q-5) How well suited is Malletts Bay for _____ (from Q-4 above)?

- ☐ a) Well Suited (go to Q-6a)
☐ b) Average (go to Q-6b)
☐ c) Not Well Suited (go to Q-6b)

Q-6a) What is the main reason Malletts Bay is well-suited to your primary activity?

- ☐ a) convenient/good access
☐ b) scenic beauty/clean water
☐ c) good services (for boats; food, beverages available)
☐ d) other

Q-6b) Why is Malletts Bay **not** well suited to your primary recreational activity?

- ☐ a) Malletts Bay is not convenient/poor access.
☐ b) Malletts Bay is too crowded.
☐ c) Malletts Bay is too polluted.
☐ d) I pursue my primary activity elsewhere. (GO TO Q-6c)
☐ e) Other

Q-6c) Where do you normally go? _____



Appendix F: Prioritizing Goals

Malletts Bay Recreation Management Plan - Prioritizing Goals

Steering Committee Member Name: _____

The following exercise is to help prioritize the management strategies suggested in the Management Plan; determining which should be implemented first. The task is to compare the management goals in column A with those in Column B and rate their relative importance according to the Comparison Scale below.

A	B	Rating
Minimize Boating Conflict	Minimize Perceived Crowding	_____
Minimize Boating Conflict	Provide Adequate Access	_____
Minimize Boating Conflict	Support Cultural/Tourism Resources	_____
Minimize Boating Conflict	Improve Water Quality	_____
Minimize Boating Conflict	Maintain Ecological Health	_____
Minimize Boating Conflict	Provide Adequate Berthing	_____
Minimize Perceived Crowding	Provide Adequate Access	_____
Minimize Perceived Crowding	Support Cultural/Tourism Resources	_____
Minimize Perceived Crowding	Improve Water Quality	_____
Minimize Perceived Crowding	Maintain Ecological Health	_____
Minimize Perceived Crowding	Provide Adequate Berthing	_____
Provide Adequate Access	Support Cultural/Tourism Resources	_____
Provide Adequate Access	Improve Water Quality	_____
Provide Adequate Access	Maintain Ecological Health	_____
Provide Adequate Access	Provide Adequate Berthing	_____
Support Cultural/Tourism Resources	Improve Water Quality	_____
Support Cultural/Tourism Resources	Maintain Ecological Health	_____
Support Cultural/Tourism Resources	Provide Adequate Berthing	_____
Improve Water Quality	Maintain Ecological Health	_____
Improve Water Quality	Provide Adequate Berthing	_____
Maintain Ecological Health	Provide Adequate Berthing	_____

Comparison Scale

- 1 A is equally important as B
- 2 A is moderately more important than B
- 3 A is strongly more important than B
- 4 A has demonstrated importance over B
- 5 A is extremely more important than B
- 6 B is moderately more important than A
- 7 B is strongly more important than A
- 8 B has demonstrated importance over A
- 9 B is extremely more important than A

NOTE: This exercise is based upon the "Analytical Hierarchy Process" which is used frequently by committees and state agencies in their decision making.



