December, 2001

Dear Parker River/Essex Bay ACEC Steward:

Over the past 25 years, the Executive Office of Environmental Affairs (EOEA) has recognized the importance of protecting and preserving Areas of Critical Environmental Concern (ACECs) in Massachusetts. ACECs provide a unique opportunity for local communities to work in partnership with state agencies and other organizations to take an active role in preserving the environmental quality, historic character, and associated economic values of a region.

The Parker River/Essex Bay ACEC was designated in 1979 in recognition of the more than 25,500 acres of estuarine, riverine, salt marsh, and barrier beach ecosystems within the municipalities of Newbury, Rowley, Ipswich, Essex, and Gloucester. This ACEC contains extensive clam flats and recreational opportunities that are important resources to the local and regional economy. State and federal agencies, conservation organizations, businesses, and residents of the North Shore share stewardship responsibilities in this ACEC.

We are pleased to provide you with a report entitled "An Assessment of Resource Management Strategies in the Parker River/Essex Bay ACEC". This assessment provides an overview of natural resource issues, case studies, and ideas for improved regulatory and nonregulatory management strategies as identified by volunteers and staff from ACEC communities. The report describes this local perspective and identifies approaches for regional ACEC management. We hope the ideas presented here will provide the information you may need to enhance communication and encourage implementation of innovative management strategies.

Please review this assessment and contact the Massachusetts Office of Coastal Zone Management's ACEC Stewardship Coordinator, Katie Lund, at (508) 289-2889 with any questions and additional ideas you might have for stewardship of the Parker River/Essex Bay ACEC. You may also contact the CZM North Shore regional office staff at (978) 281-3972 or the ACEC Program's Coastal Coordinator, Liz Sorenson, at the Department of Environmental Management at (617) 626-1394.

Very truly yours,

Bob Durand

Acknowledgements

Many local officials and volunteers who took time from their demanding schedules to participate in assessment interviews made this document possible. Although these people are too numerous to list here, they are cited in the section entitled *Resource Issues for ACEC Municipalities.* We especially want to thank them for providing anecdotal accounts, historical narratives, and the essential information that comprises the majority of this report. All photos, including the cover, were taken by Katie Lund unless otherwise noted. The cover was designed by Arden Miller, CZM.

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I. INTRODUCTION

BACKGROUND

The Parker River/Essex Bay Area of Critical Environmental Concern (ACEC), designated in 1979 by the Massachusetts Secretary of Environmental Affairs, contains 25,500 acres of estuarine, riverine, salt marsh, and barrier beach ecosystems within the municipalities of Newbury, Rowley, Ipswich, Essex, and Gloucester (Figure 1). The Massachusetts Department of Environmental Management (DEM) administers the ACEC Program and coordinates closely with the Massachusetts Office of Coastal Zone Management (CZM) regarding all coastal ACECs. The ACEC designation encourages coordination of local, regional, state, and federal agencies and organizations to preserve, restore, and enhance resources of this area. Projects within the ACEC boundary require higher environmental standards and review through the existing state environmental regulatory framework, including the Massachusetts Environmental Policy Act (MEPA), the Waterways Regulations (Chapter 91), the Wetlands Protection Act, the Solid Waste Facilities Site Assignment Regulations, and CZM policies.

Local governments are not required to establish and implement new regulations or policies to address impacts on ACEC resources. However, ecological, economic, and recreational interests in the ACEC and issues including loss of open space, salt marsh degradation, and water pollution can effectively be addressed through local bylaws and regulations. This assessment highlights both regulatory and nonregulatory approaches that ACEC stewards can consider to improve natural resource management in their communities.

Since "one size does not fit all" when it comes to developing strategies for resource management, there is need for creative approaches and partnerships to effectively address issues in ACEC communities. Fortunately, many partners in the region (Appendix A) are committed to developing flexible programs and to working with local officials and volunteers to provide technical assistance. By working together, local and regional partners can promote a strong network of support for resource protection, access a broader range of regional funding sources, and draw on expertise from diverse organizations working to protect the natural environment. This assessment highlights case studies and actions that these partners can consider to further their goals of resource management. Ultimately, collaborative efforts will broaden the network of North Shore organizations working to protect this unique area.

DESCRIPTION OF STUDY

Assessing local and regional resource management strategies is one step towards improving ACEC stewardship efforts. This document presents the results of an assessment conducted for the Parker River/Essex Bay ACEC in Winter, 2000 and is intended to serve as an information link among the five municipalities and partners working throughout the ACEC. The report is targeted to those who make and implement policy decisions through bylaws and regulations, as well as those who use nonregulatory approaches for natural resource protection.

This document has four main objectives:

1) identify priority natural resource issues in the ACEC region and

This assessment highlights both regulatory and nonregulatory approaches that ACEC stewards can consider to improve natural resource management in their communities.

the five municipalities;

2) document existing regulatory and nonregulatory strategies for natural resource protection in the five ACEC municipalities (Appendix B);
3) highlight innovative approaches and transferable case studies to help address resource issues; and
4) identify local and regional management strategies to address environmental concerns.

These objectives were accomplished by reviewing existing local zoning bylaws, planning board rules and regulations, and wetland bylaws (Appendix B) and by interviewing local boards, commissions, and departments within the five municipalities, as well as some staff from regional organizations (see Appendix C for a list of interview questions). Their anecdotal accounts of both the regulatory and nonregulatory framework and their identification of issues and case studies comprise the majority of this report.

To begin, an overview of the natural resource issues within the Parker River/Essex Bay ACEC is presented. A brief summary of each municipality's primary resource concerns as articulated in local interviews follows. The next section highlights particular case studies as examples of successful strategies that other towns, agencies, and organizations might consider if they have not yet taken such action. Case studies include growth management techniques, approaches for acquiring and protecting land, nonregulatory mechanisms for reducing stormwater discharge, strategies for water conservation, and ways to strengthen wetlands bylaws and regulations. The final section identifies strategies for action, as offered both by local officials and CZM staff.

Figure 1. Parker River/Essex Bay ACEC boundary

II. Natural Resource Issues In The ACEC

The following sections (unless otherwise noted) are abbreviated summaries from the *Parker River/Essex Bay Area of Critical Environmental Concern Resource Inventory* prepared by CZM in spring, 2000 (Busse 2000). To receive a copy of the resource inventory, contact the CZM North Shore Regional Office at 978-281-3972. For a list of agencies and organizations that can offer assistance for these issues, refer to Appendix A.

Photo by Robert Buchsbaum

WATERSHED PROTECTION

River networks in the Parker, Ipswich, and North Coastal watersheds connect resources in the Parker River/Essex Bay ACEC. The Parker River Watershed encompasses 83 square miles and is bordered by the Merrimack River Watershed to the north and the Ipswich River Watershed to the south. Water flow in the Parker River is reduced to a trickle in the summer and may cease completely in certain segments during years of low precipitation. Dams and low water supply especially impact anadromous fish runs in this watershed. Communities within the Parker River Watershed are mostly rural in character with low-density housing and many farms. However, land use is changing as the population in the watershed increases each year. With additional commercial and residential development come greater concerns of water quality problems and loss of open space.

The Ipswich River Watershed encompasses 155 square miles. Along its course, the river and tributaries flow through wetlands that help maintain good water quality. These wetlands and the watershed's groundwater provide much of the river's flow during drier times of the year. Water use efficiency and conservation is a great concern in the region since portions of the river run dry in the summer especially during times of drought and high water withdrawl. Shellfish and anadromous fish runs in tidal portions of the river also rely on adequate water supply and quality. Most of the watershed is forested while a smaller percentage is made up of residential, industrial, and commercial development.

The North Coastal Watershed encompasses 168 square miles along the coast from Boston to the North Shore. The dominant resource industries in the upper North Shore ACEC communities of Essex and Gloucester include commercial fishing for finfish, lobsters, and shellfish harvesting. As in other ACEC watersheds, water quality in tidal portions of the Essex River and in Essex Bay is a concern to shellfish harvesters. These two ACEC communities in the North Coastal Watershed have retained their scenic and environmental character, but are also being faced with increasing threats of suburban sprawl and loss of open space. *See Appendix A for watershed organization and agency contact information.*

WATER SUPPLY

(Information derived through assessment interviews)

Over the last 15 years, ACEC towns have experienced significant population growth, with resulting impacts on water supplies. For some communities, supplying adequate water for the future is a matter of protecting and developing local groundwater resources. However, in the Ipswich River Watershed, the

situation is more complicated. A number of water sources that draw from the Ipswich River are being stretched beyond their capacity to supply water particularly during extended dry periods. Moreover, there is competition between the water supply needs of communities and the needs of recreation, agriculture, industry, business, and fisheries and wildlife. Much of the public is unaware of the source of its water supply, the limitations, and the sustainable measures necessary to assure a continued supply.

Intensive conservation efforts and public education are effective ways to change water use habits. Technical assistance and grants from state and regional planning agencies are available to help local governments create and carry out water supply protection plans, including leak detection and system rehabilitation and aquifer land acquisition opportunities. *Refer to Appendix A for a list of agencies and organizations that focus on water supply issues.*

WATER QUALITY

Water quality within the ACEC varies depending on the location. While water quality in certain parts of the Ipswich River has improved, it has declined in tributaries to the Parker River. Impacts to tributary water quality include decreased open space, degradation of wetlands that filter pollutants, and changes in surrounding land use patterns that increase impervious surfaces. Fecal coliform bacteria, which are common indicators of disease-causing bacteria and viruses from human and animal wastes, are generally found in higher concentrations in rivers and tributaries after periods of heavy rainfall. Potential sources of bacterial pollution in ACEC waters include wastewater treatment facilities, stormwater runoff, faulty or improperly maintained septic systems, and agricultural runoff. Plum Island Sound and Essex Bay continue to have low to moderate levels of pollutants and consistently have better water quality than the tributaries because of the higher flushing rates in these estuaries.

State agencies and local organizations are committed to monitoring coastal waters to learn more about water quality pollutants and their sources. Additional opportunities for water quality improvement are available through local implementation of growth management bylaws and regulations related to the design and development of subdivisions, stormwater management, and wetlands protection. In addition, by working with regional and state agencies, local governments can target areas where elevated pollutant levels exist, such as at particular storm drains or where agricultural waste and industrial pollution are high. *Refer to Appendix A for a list of agencies and organizations that focus on water quality issues.*

SHELLFISH RESOURCES

Historically, both Plum Island Sound and Essex Bay have been major shellfishing areas with six species being harvested in the region: soft-shell clam, surf clam, blue mussel, razor clam, oyster, and ocean quahog (Buchsbaum and Purinton 2000). The soft-shell clam is the most economically important shellfishery and supports a community of harvesters, distributors, processors, and restaurant owners in the ACEC region. Shellfish populations are dynamic and unpredictable, but there is general consensus that productivity is currently low due to cumulative impacts of over- harvesting and predation over the past 20 years. In addition, longer regulatory shellfish bed closures, as a result of increased land-based pollution following rainfall events, are a concern to many harvesters throughout the region.

The Town of Ipswich has made considerable attempts to improve coastal pollution and protect shellfish resources. In the fall of 1999, shellfish beds opened in Fox and Treadwell Island Creeks due to successful water quality remediation efforts by the town and the Ipswich Coastal Pollution Control Committee (see the Case Studies section). In addition, a partnership between the Rowley Marine Advisory Board, Merrimack Valley Planning Commission, Eight Towns and the Bay, the Northeast Massachusetts Aquaculture Center, and officials in Gloucester, Ipswich, and Rowley are successfully researching the feasibility of rearing soft-shell clams for both private and public use by investigating techniques of hatchery production and wild seed harvesting (see the Case Studies section). These initiatives, combined with stormwater best management practices and wastewater management, will help maintain healthy shellfish populations in the future. *Refer to Appendix A for a list of agencies and organizations that focus on shellfish issues.*

WETLANDS

photo by Robert Buchsbaum

With approximately 10,000 acres of salt marsh, the ACEC includes the largest continuous salt marsh system in New England and is part of a region known locally as the "Great Marsh." ACEC salt marshes are protected under the Massachusetts Wetlands Protection Act, through local wetlands bylaws and regulations, and through ownership or management by municipalities and conservation agencies. Although much of the salt marsh is still relatively pristine, there are concerns of human alterations and impacts to these habitats such as tidal restrictions, including culverts and dikes, which impede the natural tidal flow. These restrictions lead to a change in native vegetation with as the invasive species *Phragmites* encroaches on degraded salt marsh habitats. A Massachusetts Audubon study in 1996 determined that although *Phragmites* have not taken over a large percentage of the region so far, it is widespread and occurs in stands ranging from a few plants to several acres (Buchsbaum 1996). Since *Phragmites* stands are considered of less value to wildlife than native salt marsh species, these sites are being targeted by resource managers for restoration and monitoring efforts. In addition to tidal alterations, monitoring results indicate that developing land adjacent to wetland habitats causes water pollution, habitat impacts, and changes in native plant and invertebrate communities (Smith 1999). Disturbance to these "edge habitats" resulting from surrounding development and stormwater runoff is estimated to worsen as pressures increase on the fringe of salt marsh environments.

Two proactive volunteer restoration programs managed by state agencies are underway in the ACEC. The state Wetlands Restoration Program (WRP) is working with volunteer professional scientists to monitor salt marsh restoration sites. Over 60 scientists are part of this program, which monitors vegetation, fish, macroinvertebrates, hydrology, and salinity both before and after a restoration project takes place. In addition, citizen volunteers are monitoring restoration sites through the Wetlands Health Assessment Toolbox (WHAT) program. CZM, the University of Massachusetts Cooperative Extension Program, and the Massachusetts Bays National Estuary Program have developed the WHAT approach to assessing wetland quality and ecological health through volunteer monitoring at different sites in the ACEC region. Each of the study sites have all been adversely affected by tidal restrictions, stormwater discharges, and nonpoint source pollution from urban development. Parameters monitored by volunteers at each site include: avifauna, vegetation, aquatic macroinvertebrates, water chemistry, tidal influence, and land use. From data collected, CZM wetland specialists can quantify the intensity of human land use within 100 meters of the salt marsh study site. By engaging citizens, WHAT partners hope to foster

stewardship of wetlands and further educate communities about complicated issues surrounding wetland values and functions. ACEC municipalities can address some of these salt marsh concerns by using local bylaws and regulations to protect wetland resources from surrounding development. *Refer to Appendix A for a list of agencies and organizations that focus on salt marsh and wetland issues.*

BARRIER BEACHES

Barrier beaches are found in most ACEC communities; according to *An Inventory of the Coastal Resources of the Commonwealth of Massachusetts* (Hankin et al. 1985), Gloucester has 172 acres, Ipswich has 1,333 acres, Newbury has 607 acres, and Rowley has 186 acres of barrier beach. In addition, Plum Island and Crane Beach are the fourth and sixth largest barrier beach landforms in Massachusetts. Barrier beach systems are dynamic landforms that undergo constant change and provide a variety of public benefits, including recreation, wildlife habitat, and storm protection (MBBTF 1994).

Federal, state, and local agencies have a variety of jurisdictional interests in beaches and dunes. Local governments play an important role as commissions, committees, and boards review proposals for construction activities in these resource areas. A number of activities that take place on beaches are appropriate for review under the Wetlands Protection Act such as construction, Off Road Vehicle (ORV) use, beach nourishment, dune construction, or restoration projects (Massachusetts Wetlands Protection Act, G.L. c. 131, s. 40). However, "passive" recreational activities that are not likely to alter beaches, such as foot traffic, boating, and horseback riding, would not be subject to the Act (MBBTF 1994). Inappropriate development on barrier beaches, coastal beaches, and dunes can cause erosion and modification of the beach or dune, resulting in severe economic loss to residents and to local, state, and federal governments.

On Plum Island, the Towns of Newbury and Newburyport are trying to address issues of growth management, water supply, and water quality through an agreement to extend water and sewer services to this barrier beach. The agreement includes measures for conserving water and for assuring that utility extensions do not promote further development on Plum Island. Responsible beach and dune management involves protecting the public interests and carefully balancing the needs of many competing user groups. *Refer to Appendix A for a list of agencies and organizations that focus on barrier beach issues.*

OPEN SPACE AND GROWTH MANAGEMENT

One primary reason the ACEC is still relatively pristine is because a large percentage of coastal wetlands and surrounding uplands are protected as conservation land and wildlife sanctuaries. However, ACEC communities are continuing to experience significant population increases. As new residents are drawn to the character and beauty of the area, homes and subdivisions are being built while more open space is being lost. If current trends of sprawling development continue, many of the natural wild places will be destroyed or severely fragmented, and the community character and quality of life in cities and towns will be diminished (Steele 1999). Degradation of community character can come with the abandonment of existing residential city and town centers, increased traffic, longer commutes, and more isolated lifestyles. Growth not only changes the character of North Shore communities, but also alters areas once dominated by forests, farmland, and coastal resources. Based on Massachusetts Executive Office of Environmental Affairs (EOEA) buildout analysis, population

and development in each of the ACEC towns are project to increase (Table 1).

Table 1. Projected population growth in ACEC towns

Town	Residents (1998/99)	Projected Buildout Populations
Newbury	6,970	11,896
Rowley	5,343	11,395
Ipswich	12,768	22,833
Essex	3,566	11,852
Gloucester	29,252	38,961

[Results for Newbury were estimated as part of the Plum Island Sound Minibay Project (Buchsbaum 1996) while Rowley, Ipswich, Essex, and Gloucester estimates were derived from the 1999-2000 EOEA buildout analysis].

Although many ACEC communities lack formal growth management plans, local and regional groups are taking steps to address the issue. Open space inventories, secured revenue for open space acquisition, community planning forums, and new concepts in subdivision design are being used by ACEC communities to varying degrees. Technical and funding support through the state's Community Preservation Act, Executive Order 418, and buildout analyses provide additional tools that communities may take advantage of to further their planning goals. Efforts to incorporate growth management strategies into local bylaws and regulations are under way in some ACEC communities and continue to be a priority for resource managers in the region. *Refer to Appendix A for a list of agencies and organizations that focus on open space and growth management issues.*

III. Natural Resource Issues In ACEC Municipalities

The Parker River/Essex Bay ACEC boundary includes municipalities of Newbury, Rowley, Ipswich, Essex, and Gloucester (Table 2).

Table 2. Acreage and percentage of towns within the ACEC
Note: *These numbers were obtained through analysis of the MassGIS database. ACEC area is calculated to be 25,500 acres*

Town	Approximate acreage	Approximate percentage of ACEC
Newbury	7,387	29
Rowley	3,898	15
Ipswich	9,866	39
Essex	3,435	13
Gloucester	912	4

For the purpose of documenting resource issues in each of these municipalities, local conservation commissions, planning boards, open space committees, and other citizens involved in local resource management efforts were interviewed (see Appendix C for a list of interview questions). Each municipality may have other issues and concerns beyond those documented in this section, however for the purpose of this report, only priority issues related to ACEC resources are sited.

Table 3. Priority natural resource issues in each ACEC municipality.
Note: *results presented are based solely on the response from interviews with local officials.*

	ACEC MUNICIPALITY				
ISSUES	**Newbury**	**Rowley**	**Ipswich**	**Essex**	**Gloucester**
Water Supply		X	X		
Water Quality	X		X	X	X
Wetlands	X	X		X	
Barrier Beach	X				
Open Space and Growth Mgt.	X	X	X	X	X

In addition to the interviews, CZM reviewed zoning bylaws, planning board rules and regulations, and wetland bylaws in each of the five ACEC municipalities and compiled the Table of Local Regulatory Strategies in Appendix B. Readers can reference this table if they want more detail about bylaws and regulations in each ACEC city or town. By looking at this matrix, readers can also determine how each municipality's regulatory approach to resource management compares with others in the region.

TOWN OF NEWBURY

The following people were interviewed about Newbury resource issues:

Sarah Creighton	Newbury Open Space Committee
Rusty Iwanowitz	Resident/Massachusetts Division of Marine Fisheries
Dave Mountain	Newbury Planning Board/Parker River Clean Water Association
Doug Packer	Newbury Conservation Commission
Alicia Raddatz	Resident/former Topsfield Conservation Agent

Information presented for the Town of Newbury is a summary of individual opinions and does not necessarily reflect the views or policies of any agency, organization, or local board/committee.

Water Quality

Some people interviewed felt that water quality is an issue of concern in Newbury. Agricultural runoff, failing septic systems, and effluent from wastewater treatment plants all contribute as sources of pollution that lead to high bacteria counts. Another source of water contamination in Newbury is the active landfill that is adjacent to the Little River and ACEC salt marsh. To address operating violations at the landfill that impact these resource areas, the Department of Environmental Protection (DEP) and the Town of Newbury recently entered into a Interim Order by Consent to improve landfill operations and bring it into compliance with wetlands and solid waste regulations. Officials in Newbury have hired an independent environmental consultant to evaluate and make recommendations for landfill operations.

To help assess water quality issues in the town, the Parker River Clean Water Association (PRCWA) conducted water quality tests and presented results to the Newbury Conservation Commission. The PRCWA is also meeting with riverfront landowners of the Parker River to discuss resource stewardship, including backyard landscaping and septic system maintenance, as well as the regulatory requirements of the state Wetlands Protection Act and the Rivers Protection Act. This outreach is helping residents better understand how upland activities affect marine and freshwater resources.

Wetlands

The town has adopted Newbury Wetland Bylaw and Regulations for Plum Island as required by the administrative consent order signed with DEP to address issues of sewer and water lines being considered for this barrier beach. The town has agreed to hire a conservation agent that will greatly increase the town's ability to implement and enforce this new bylaw.

An additional approach the town has to protecting wetland resources in the entire town are the Newbury Board of Health Regulations that require development to be set back 300 feet from the Parker River and its tributaries. Some people interviewed feel that these regulations would be more effective if placed within the zoning bylaw since it cannot be waived and is more enforceable that board of health regulations. If this regulation was incorporated into a Parker River Watershed Overlay Protection District within the zoning bylaw, the planning board would have stronger authority to require that all new development meet this 300-foot setback and greater authority than the board of health to enforce the requirement.

photo by Arden Miller

Barrier Beach Resources

In response to an Administrative Consent Order (ACO) issued by the Massachusetts Department of Environmental Protection (DEP), the Town of Newbury and the City of Newburyport are required to take action to improve the current water supply on the Plum Island by extending the city's water distribution system and making improvements in the wastewater collection system to service the community on this barrier beach. The ACO further directed the town and the city to adopt a Plum Island Overlay District zoning bylaw/ordinance, as well as a wetlands protection bylaw/ordinance and accompanying regulations, to ensure that utility services do not encourage growth and development on this barrier beach as pursuant to Executive Order 181. These land use controls will help ensure that additional growth will not have a negative impact on barrier beach resources or pose a threat to public welfare and safety by building in high coastal hazard areas.

Open Space and Growth Management

Newbury's large tracts of open space, including protected areas and privately owned parcels, add to the strong rural character of the town. Conservation lands comprise nearly half of the town's total acreage, a large percentage of which is in wetland areas. However, the town still has large tracts of potentially developable land and other areas where redevelopment is transforming small summer cottages to larger, year-round residences. Also, the extension of the commuter train has brought families from the Boston area searching for homes in this smaller rural community. Farmers are selling off their land to developers and are consequently being pushed to marginal areas closer to the Parker River. These factors lead to a loss of open space, an increase in pressure on town resources, such as water supply and water quality, and a diminishment of the town's rural character.

Town officials have had little concern about the loss of open space thus far because half the town is either protected or located under water, and thus considered undevelopable. Moreover, developable tracts of land are often viewed as sources of tax revenue while the town does not have adequate financial resources to purchase land (especially Chapter 61A land) as it becomes available for potentially protected open space. However, recent events illustrate a growing interest in open space protection among residents. At a recent town meeting voters decided to purchase a small piece of open space in Byfield and the town recently completed and received approval for an Open Space Plan that can be viewed on the Newbury Planning Board's website.

At its April, 2001 Annual Town Meeting, Newbury became the first coastal community in the Commonwealth to pass the Open Space Residential Design (OSRD) bylaw. OSRD is a local planning tool that can be used as an alternative to the conventional subdivision of land. OSRD encourages early planning and discussion to preserve open space and natural areas while constructing subdivisions in a more economical and efficient manner. The town views OSRD as an effective way to create neighborhoods, maximize the amount and quality of open space preserved, and provide more opportunities for mixed housing.

Table 4. Newbury reference table		
ACEC resource issue	*Case study page #*	*Action strategy page #*
Water quality	22-25	41-42, 45-46
Wetlands	27-28	46
Barrier beach resources		47
Open space/growth management	28-34	42-44, 46-47

TOWN OF ROWLEY

The following people were interviewed about Rowley resource issues:

John Ashworth	Rowley Conservation Commission
Sue Moses	Rowley Open Space Committee
Cliff Pierce	Rowley Planning Board
Tim Purinton	Former Rowley Conservation Agent
Russ Hodgston	Former member of the Rowley Planning Board

Information presented for the Town of Rowley is a summary of individual opinions and does not necessarily reflect the views or policies of any agency, organization, or local board/committee.

Water Supply

Rowley's rapid rate of growth and development has impacted the town's water supply. In 1998, the town opened a third public well to accommodate increased population and residential development. Officials also had to implement water-use restrictions to limit water consumption and control the quality of drinking water. In effort to protect the wellhead and prevent further development in these water supply areas, the town recently purchased Pingree Farms and Hunsley Hills, which are considered important parcels in the Rowley Open Space Plan.

Wetlands

In an attempt to protect wetland resources, particularly those within or adjacent to the ACEC, the town recently drafted a wetland bylaw and regulations. The draft bylaw includes measures to address areas not subject to the state's Wetlands Protection Act, such as isolated vegetated wetlands and ephemeral pools, and creates strict performance standards for resource areas and buffer zones. In particular, the draft bylaw would create a 150-foot buffer zone to the ACEC in which any proposed project would be subject to review and approval by the conservation commission. The draft bylaw was recently turned down at a spring, 2000 town meeting due to a lack of public support. However, officials recognize that efforts to better inform the public and involve them in the next bylaw draft will prove more successful and plan on bringing a modified version of the original bylaw before a future town meeting.

Open Space and Growth Management

Rowley officials indicate that a damaging pattern of residential and commercial sprawl is threatening to change the character of the town. This pattern of growth can impair the quality and quantity of water resources and wetlands, remove old growth forests and vegetation, and in some cases threaten

resource-based economic activities and employment, such as shellfishing. In addition, unmanaged sprawl increases infrastructure and service expenses to the community.

The town has implemented some measures to address the issue, including a Rowley Rate of Development Bylaw (limiting development to 24 units per year) and zoning changes (increasing the minimum lot area requirements from 40,000 square feet to 60,000 square feet and increasing lot frontage in every district). However, officials remain concerned with issues related to the limited jurisdiction of the conservation commission, the effectiveness of Title V as a growth management tool, and the effectiveness of the Rowley Soils Suitability Bylaw. Some feel that a comprehensive approach to growth management, such as master planning, could tie some of the town's existing strategies together while planning for future development. To work toward that end, the town is currently in the process of preparing a Community Development Plan, as pursuant to Executive Order 418. The planning board is also considering adopting an Open Space Residential Design (OSRD) bylaw as another local planning tool that can be used as an alternative to the conventional subdivision of land. OSRD encourages early planning and discussion to preserve open space and natural areas while constructing subdivisions in a more economical and efficient manner.

Table 5. Rowley reference table

ACEC resource issue	*Case study page #*	*Action strategy page #*
Water supply	21	41, 47
Wetlands	27-28	47
Open space/growth management	28-34	42-44, 48

TOWN OF IPSWICH

The following people were interviewed about Ipswich resource issues:

Kathryn Glenn	Former Ipswich Conservation Agent
Wayne Castonguay	TTOR Northeast Region Ecologist, Coastal Pollution Control Committee
Glenn Gibbs	Ipswich Department of Planning and Development
Glenn Hazelton	Ipswich Open Space Committee
Kerry Mackin	Ipswich River Watershed Association/Growth Management Committee
David Standley	Ipswich Conservation Commission and Open Space Committee

Information presented for the Town of Ipswich is a summary of individual opinions and does not necessarily reflect the views or policies of any agency, organization, or local board/committee.

Water Supply

The Town of Ipswich obtains most of its water supply from the Parker River Basin, the Ipswich River Basin, and two impoundments in the Egypt River. During summer months, the Ipswich River has been documented with extremely low flows on several occasions. Historically, water use has been

approximately .5 million gallons per day over the allowed amount. The Ipswich River Watershed Association (IRWA) documented a need for the Town of Ipswich to implement Massachusetts Water Conservation Standards (IRWA 1998) (see the Case Studies section).

In order to address the issue of water supply, the town has begun to discuss the need for a water connection moratorium, a pro-active water conservation plan with restrictions, and disincentives for high water consumption. During periods of drought and water shortage, the town has successfully responded with restrictions on water use. When restrictions were imposed in 1997, the town strictly limited outdoor water use to night-time hours and required hand-watering only, which proved effective in reducing the summertime peak water demand (IRWA 1998). The public responded with varied opinions: some believed the town should be responsible for providing sufficient services, while others took initiatives to prepare for drought using such methods as low-maintenance and low-water gardening.

Water Quality

With approximately 500 acres of intertidal shellfish beds, Ipswich has been a major producer of oysters, mussels, scallops, and clams. However, over the past several years, residential growth and land development have led to increased stormwater runoff and coastal pollution. As a result, shellfish harvest following a rainstorm is prohibited in certain areas. However, the town has been working hard to successfully mitigate some identified water quality impacts and as a result, shellfish beds in Fox and Treadwell Island Creeks have recently been opened to harvesting. Recently, the town appropriated money to upgrade the treatment plant pump station so that it will operate at full capacity. The plant also changed disinfection techniques from chlorination to the more environmentally friendly ultra-violet irradiation as a means to control microbiological contaminants (bacteria/viruses). Ipswich continues to make upgrades in the treatment plant by constructing a new forced main that is part of a project to eliminate or greatly reduce the overflow of raw sewage from discharge points located at the Town Wharf and Choate Bridge. The Town Wharf pump station is also scheduled to have new pumps installed that will better handle the increased flow resulting from installation of the new forced main. With treatment plant improvements, it is likely that rainfall events and stormwater runoff will contribute the primary impacts to water quality and shellfish resources in Ipswich.

The Ipswich Coastal Pollution Control Committee (CPCC) has taken steps to address septic system failures, lobbied for sewage treatment plant improvements, and helped improve farm waste management practices (see the Case Studies section). The CPCC has inventoried every storm drain and ditch that discharges stormwater to coastal areas and has identified 50 sites causing significant amounts of pollution. Thirty-seven of these point sources of pollution were recommended for a best management plan, of which eight sites now have plans implemented (Mehaffey 2000b).

Ipswich is the only ACEC municipality to have a stormwater management plan that addresses many of the water quality issues stated above. This plan is based on information from CPCC reports and is currently being reviewed by the Selectmen. To implement the plan, town officials need technical and financial resources to help them incorporate recommended actions into their workplan.

Open Space and Growth Management

Some people interviewed for the Town of Ipswich indicate that a primary

natural resource concern is the potential of future growth and development on Great and Little Necks if the areas are sewered. There is substantial growth potential on 140 "grandfathered" unbuildable lots (rendered unbuildable by their inability to percolate for Title V septic systems) and the 90 acres of land leased to the Air Force. This land would all be developable if the area is sewered. Sewering will also likely cause the demolition of the existing houses in favor of larger homes and increase stormwater runoff from added impervious surfaces. Although one study that investigates potential sewer project costs and impacts was completed for the town in 2000, both officials and residents questioned the accuracy of development projections in the report. Therefore, the town is looking to fund a second study in 2001 to look solely at the development impacts.

Like Newbury, the town is using OSRD as an alternative to the conventional subdivision of land to create neighborhoods, maximize the amount and quality of open space preserved, and provide more opportunities for mixed housing.

The town recently mended its cluster bylaw to include the principles of Open Space Residential Design (OSRD). Like Newbury, the town is using OSRD as an alternative to the conventional subdivision of land to create neighborhoods, maximize the amount and quality of open space preserved, and provide more opportunities for mixed housing.

Table 6. Ipswich reference table

ACEC resource issue	*Case study page #*	*Action strategy page #*
Water supply	21	41, 48
Water Quality	22-25	41-42, 48
Open space/growth management	28-34	42-44, 49

TOWN OF ESSEX

The following people were interviewed about Essex resource issues:

Westley Burnham	Essex Planning Board
Stephan Gersh	Essex Conservation Commission
Ed Perkins	Essex Conservation Commission
Betsy Shields	Essex Planning Board

Information presented for the Town of Essex is a summary of individual opinions and does not necessarily reflect the views or policies of any agency, organization, or local board/committee.

Water Quality

Up until the May, 2000 town meeting, Essex did not have any mechanism within its zoning bylaw for enforcing stormwater standards. To address this concern, the town recently approved an amendment to the site plan review bylaw under the special permit section that includes drainage management review for projects. This action is a major step in reducing water quality impacts to critical resources protected within the town's wetland district, the flood plain district, and the water resources protection district. However, stormwater from residential development is not covered under the site plan/special permit change because these sections only cover commercial and multi-family rather than single family and subdivision development.

For many years, the Town of Essex has struggled with high nutrient concentrations and pollution in the Essex River. When the town instituted a

sampling program in 1995 to investigate pollutant types and sources as part of their wastewater management planning efforts, the primary contributing sources were identified as failing septic systems and stormwater discharge. Recently, an agreement was formulated and approved by both the Town of Essex and the City of Gloucester to allow Essex to send 225,000 gallons of wastewater per day to Gloucester's sewage treatment plant. Although the costs are higher than if Essex built its own sewer, the town avoids having to find a suitable location in town and avoids unwanted discharge of waste into an environmentally sensitive estuary.

Wetlands

The Town of Essex currently does not have a wetlands bylaw or regulations. Some Town officials believe that the Massachusetts Wetlands Protection Act and the Rivers Protection Act adequately protect these resource areas. Currently, a wetland district defined within the zoning bylaw acts as an overlay district. This district, which primarily addresses water quantity rather than quality, is defined to serve the purposes of flood protection, water table preservation, and conservation of natural resources for education, recreation, and general public welfare. The planning board is the entity acting as the special permit granting authority for exceptions to restricted uses. However, missing from the wetland district are performance standards addressing water quality, open space, and wetland habitat particularly within buffer zones to resource areas.

Open Space and Growth Management

The Town of Essex is currently not divided into residential, commercial, and industrial zoning districts. Most planning board members feel that the zoning bylaw, with its dimensional and density regulations and special district overlays, is effective in managing growth and that newly created zoning districts would actually increase the rate of development with the added security it allows developers. Similarly, others believe forming zoning districts would have negative effects as it creates many non-conformities since the town has already taken shape with a mix of residential and commercial use. Conversely, others maintain that implementing zoning districts would better define suitable locations for residential, commercial, and industrial development and better guide future growth management in the town.

Some local officials expressed concern about a provision within the water resource protection district of the zoning bylaw that allows more impervious surface coverage for commercial development. The zoning district standards specifically prohibit residential development on lots less than 40,000 square feet or that renders impervious area more than 15% of the lot area. On the other hand, commercial developments are permitted by special permit if more than 15% of lot area or 2,500 square feet is made impervious provided that a system for artificial recharge of stormwater is incorporated into the plan. This provision, combined with the lack of zoning districts, leads to the potential for more commercial development with overall increased impervious surface coverage throughout the town. Attempts to remedy this concern were made at the town meeting in May, 2000 to reduce the residential limitation rather than make requirements for commercial developments more stringent. Local officials feared that if commercial developments were subject to the same standards as residential, the result would be the creation of many existing non-conformities. Non-conforming structures are then subject to more restrictions and may require a Zoning Board of Appeals hearing if additions or alterations are proposed in the future. Ultimately, neither standard has yet to be changed because residents turned down the article, stating that they feared it would endanger the town's watershed.

Table 7. Essex reference table		
ACEC resource issue	***Case study page #***	***Action strategy page #***
Water quality	22-25	41-42, 49
Wetlands	27-28	49
Open space/growth management	28-34	42-44, 50

CITY OF GLOUCESTER

The following people were interviewed about Gloucester resource issues:

Sam Cleaves	Former City Planner
Thomas Keough	Community Development Department/ Former Conservation Agent
Dave Sargent	Gloucester Shellfish Advisory Board
Dr. Arthur Socolow	Conservation Commission

Information presented for the City of Gloucester is a summary of individual opinions and does not necessarily reflect the views or policies of any agency, organization, or local board/committee.

Water Quality

In 1996, a Wastewater Management Plan (WMP) was written by the City of Gloucester to address issues stemming from water quality concerns and problems with failing septic systems. As a result of inspections conducted under the WMP, 85-90% of on-site septic systems were identified as failing in the Walker Creek 50 foot Critical Buffer Zone (a portion of which falls within the ACEC boundary). Results from wet and dry weather sampling in the creek show that fecal coliform levels exceed those required for both shellfish harvest and swimming standards, with levels > 200 coliform per 100 ml of seawater. However, mandatory septic upgrades in all of West Gloucester are on hold until it is decided what areas will be sewered. As a result, the upgrade requirements (as specified in the WMP) for Walker Creek have not yet been implemented. To remove some pollutants in this area, the city installed re-circulating sand filters at storm drains identified as contamination sites along Walker Creek.

Developments known as Castle View 1 and 2 (in West Gloucester near the ACEC boundary) have also raised water quality concerns. Castle View 1 was constructed before the new state Title V regulations were imposed. Thus, existing septic systems in this area were not designed to meet current performance standards and often do not function properly. Monitoring results have shown elevated levels of fecal coliform bacteria during two surface outbreaks. As a result of the pollution problems in this subdivision, Castle View 2 was constructed with a series of detention basins and re-circulating sand filter systems to reduce bacterial contamination of nearby waters. These management practices appear to be functioning properly as monitoring results show low levels of fecal coliform. Both the Shellfish Department and concerned citizens continue to monitor water quality in West Gloucester and meet with city Health Department officials on a regular basis to discuss their results.

Open Space and Growth Management

A resource concern expressed by local officials in Gloucester is the loss of open space and wildlife habitat. Although approximately 45% of Gloucester's nearly 15,000 acres of assessed land is open space (Joyner 2000), development in and around these resource areas has led to fragmentation and impacts to habitat. Up until now, Title V and the city's board of health regulations that are even more stringent than the state standards, have helped limit growth. However, officials recognize the need to plan for future development and open space, rather than manage land through sewer and septic permitting.

One method for protecting open space is offered within the Cluster Development Zoning provision found within the city Zoning Ordinance. This provision requires cluster subdivisions to maintain greater than 30% of the land as open space. However, the cluster zoning alternative is rarely used over conventional subdivision design because of the uncertainty of an approval and the potential need to invest a great deal of money during the lengthy special permit process. The planning department is currently considering incorporating concepts of Open Space Residential Design (see the Case Studies section) such as using a preliminary conceptual plan rather than a required definitive plan as an incentive to developers. The City of Gloucester has also recently amended the zoning ordinance to increase the minimum lot size requirements in certain districts and double the minimum lot size when creating "pork-chop" lots. Neither provision necessarily has the effect of reducing building lot coverage, but they do reduce the number of buildable lots.

To address their city's future, Gloucester volunteers and city staff are in the process of writing a 10 year community development plan. The Community Development Plan 2000 Committee has been gathering public opinion about concerns in Gloucester through a series of meetings and have spent nearly a year collecting data and information to support the plan. Thus far, Gloucester residents report that, "protecting natural areas – from shorelines to woods, marshes to meadows – is a chief concern of those who live here" (Joyner 2000). The Community Development Plan is viewed by residents as an opportunity to tackle important natural resource issues.

Table 8. Gloucester reference table

ACEC resource issue	*Case study page #*	*Action strategy page #*
Water quality	22-25	41-42, 50
Open space/growth management	28-34	42-44, 51

The Community Development Plan is viewed by residents as an opportunity to tackle important natural resource issues.

IV. Regional And Local Case Studies

The examples listed here are intended to provide agencies, organizations, and municipalities with information about creative approaches and models that can be transferred throughout the region.

The following case studies were derived from interviews with local officials and regional agencies and conservation organizations, as well as through a review of bylaws, regulations, and newspaper accounts of recent town initiatives. Each section highlights some of the innovative regulatory and nonregulatory approaches to natural resource protection. Regulatory approaches include case studies highlighted from zoning bylaws, wetland bylaws and regulations, and planning board rules and regulations in the five ACEC communities. Nonregulatory strategies include innovative tools for water supply, water quality, shellfish resources, open space, and growth management. In addition, a section for *Technical Assistance and Information Sharing* is included to highlight particularly useful resources available for further information. The examples listed here are intended to provide agencies, organizations, and municipalities with information about creative approaches and models that can be transferred throughout the region. Please contact the organizations or agencies (Appendix A) identified at the end of each case study for more information.

WATERSHED PROTECTION

Parker River Watershed Nonpoint Source Monitoring and Analysis

The Massachusetts Office of Coastal Zone Management (CZM) is leading an effort with other agencies and organizations to develop *a Nonpoint Source (NPS) Monitoring and Analysis Framework*. This framework creates tools for using water quality monitoring data and land use information to evaluate NPS control efforts in coastal watersheds. The pilot project currently underway in the Parker River Watershed will develop tools to link land use trends and patterns, chemical and biological data from aquatic sources, and information about NPS pollution control methods. Ultimately, Geographic Information System (GIS) tools will be developed that will help coastal managers to: 1) assess NPS control methods and their effectiveness in protecting and restoring the condition of coastal aquatic resources such as estuaries, rivers, and salt marsh habitats; 2) identify relationships between development patterns and their impacts on aquatic resources; and 3) determine areas at risk or locations where monitoring stations should be sited. **Contact: Massachusetts Office of Coastal Zone Management.**

WATER SUPPLY

Innovative Water Conservation Techniques

The Town of Ipswich has taken positive steps toward water conservation by completing a leak detection study in 1997, which discovered a 20% loss and resulted in repairs that amounted to water savings of 170,000 gallons per day. In addition, the town has attempted to comply with the state recommendation of 100% metering by contracting for and replacing meters with an automatic metering system that cuts down on unaccounted water. During periods of drought and water shortage, the town has successfully responded with restrictions on water use. When restrictions were imposed in 1997, the town strictly limited the hours of outdoor water use to night-time hours and required hand-watering only, which proved effective in reducing summertime peak water demand. In

1998, the Ipswich River Watershed Association (IRWA) wrote an effective report addressing water supply issues for the Town of Ipswich (IRWA 1998). Recommendations were written to improve water efficiency, the results of which helped motivate a town-wide educational campaign. IRWA also encouraged other remedies, such as: 1) town subsidies for water efficient plumbing; 2) water pricing to reward low-volume use and discourage high water use by implementing an "inclined block structure" rather than a flat rate; 3) continued aggressive water restrictions, enforcement, and establishment of non-criminal disposition and citations; 4) subdivision guidelines for water-efficient plants, limitations on lawn size, and landscaping with natural plantings; and 5) environmentally designed golf courses (IRWA 1998).
Contact: Ipswich River Watershed Association.

WATER QUALITY

Drainage Plans for Approval Not Required Lots

Those seeking permits for new homes in Gloucester now have to submit detailed plans of how their projects will affect drainage in a given area. The change to the zoning ordinance in August, 2000 is designed to stem unexpected water runoff onto neighboring properties as drainage and grading plans will now be approved by the city's director of public works. These plans must show how runoff and grading will be affected by a given project and must be approved before a building permit can be issued. However, it is the public works director's discretion whether to exempt certain project proponents from submitting a plan if the project will not affect drainage or grading in a given area. The plans must also detail the extent of woodlands, trees, and ledge composition in addition to drainage and grading levels. This zoning ordinance change gives Gloucester the opportunity to review single family home projects categorized as Approval Not Required (ANR). ANR lots traditionally do not require review or approval by a planning board as they have existing frontage on a town road or on an approved subdivision road. By requiring drainage plans, the building inspector can now review these plans to ensure adequate stormwater management.
Contact: Gloucester Planning Department.

Those seeking permits for new homes in Gloucester now have to submit detailed plans of how their projects will affect drainage in a given area.

Stormwater Performance Bond

Most ACEC communities have subdivision regulations requiring that a stormwater management plan include compliance with state stormwater standards. In addition to the typical best management practices (BMPs) for water quantity, the regulations require BMPs that reduce pollutants and sediments in surface runoff to reduce negative water quality impacts from new growth and development. The conservation commission has this jurisdiction for water quality under the Wetlands Protection Act, but only for specific resource areas and associated buffers.

A unique section found in both the Rowley and Newbury Planning Board Regulations that extends review of water *quantity* to address water *quality* concerns is the requirement of a separate stormwater performance bond. Usually, performance bonds are posted by developers to cover the road and drainage structures until the subdivision is constructed or the road and utilities are accepted by the town. The stormwater performance bond focuses on the construction of stormwater mechanisms and more importantly, includes follow-up water quality monitoring to assure that these practices are working effectively. If monitoring indicates that the BMPs do not meet water quality expectations, the bond will include funding to improve the BMPs until results comply with

stormwater standards. With Rowley and Newbury adopting these unique water quality stormwater standards under planning board regulations, the areas just outside the conservation commission jurisdiction (but equally important to ACEC protection) can now be reviewed by the planning board.
Contact: Coastal Zone Management, North Shore Regional Office.

Wastewater Management Overlay District

In order to manage growth due to the proposed new sewer line between Essex and Gloucester, the City of Gloucester has approved a West Gloucester Overlay District that places restrictions on growth within a 3,301 acre area. The district will prevent immediate development of 1,326 lots in these areas. Subdivisions that result in four or more lots will require the approval of the planning board through the special permit process and are prohibited from connecting to the city sewer. Subdivisions, therefore, must provide for the installation of septic systems that meet Title V standards and will not have access to the sewer lines for five years unless their septic system fails. The district will remain in place for five years during which time a permanent growth management plan will be developed. This wastewater management overlay district is an innovative approach taken by the city to plan for growth.
Contact: Gloucester Planning Department.

As part of the plan, failing septic systems within 50 feet of a stormdrain that discharge into nearby waterways were identified and targeted for future remediation.

Wastewater Management Plan

A 1996 Wastewater Management Plan was written to address issues stemming from water quality concerns and problems with failing septic systems in Gloucester. As part of the plan, failing septic systems within 50 feet of a stormdrain that discharge into nearby waterways were identified and targeted for future remediation. Along Walker Creek (which is within the boundary of the ACEC), 85-90% of tested systems were shown to fail. As part of the plan, Gloucester will provide low cost loans for improving existing septic systems that are not tied into the sewer. The management plan has proven successful in identifying failing septic systems in need of upgrades and for providing information to determine how much of the town is to be sewered.
Contact: Gloucester Board of Health.

Agriculture Best Management Practices

A local diary cow farming family has turned its land and operations into a model for agricultural management in order to prevent fecal coliform in manure from reaching riverways and eventually ACEC coastal waters. Since 1995, the Herricks of Rowley have partnered with local officials, state and federal agencies, and conservation organizations to discover the best methods to reduce agricultural runoff pollutants and to fund the design and installation of some "best management practices" (BMPs). To assist the family with this important environmental effort, a support team was assembled including the Natural Resources Conservation Service, CZM, the North Shore Office of Massachusetts Audubon Society, and the Parker River Watershed Team. The project involves BMPS that fence cows out of the wetlands, restore vegetation so the wetlands can act as a natural pollutant filtration system, create a system of swales and berms to act as settling basins that remove contaminants before the runoff eventually reaches the Mill River, and replace roadway culverts to restore flow between the wetlands. Both pre- and post water quality monitoring data is used to determine the effectiveness of these innovative BMPs. Outreach materials are being developed to educate farmers and stable owners about the findings of BMP evaluations, funding opportunities, availability for technical assistance, and the successful partnership approach.
Contact: Coastal Zone Management, North Shore Regional Office.

Coastal Pollution Control Committee

The Coastal Pollution Control Committee (CPCC) was created in 1991 by the Ipswich Board of Selectmen to identify, evaluate, and recommend actions designed to reduce and control levels of fecal coliform bacteria affecting the coastal area of Ipswich. The Committee produced a final report, which identified the primary sources, transport mechanisms, and impacts of coastal pollution from fecal coliform and suggested ways to address these impacts (ICPCC 1995).

The CPCC recommended in their 1995 report that a stormwater management plan be developed to combat the most significant source of pollution to coastal waters. The draft plan is based on more than 1000 water samples identifying sources of pollution in town. As part of the 1995 final report, the town developed a spreadsheet of prioritized recommendations; many of the recommendations have since been implemented. The CPCC has been successful in addressing and improving upon: 1) septic failures; 2) farm waste management practices and pet waste practices; 3) sewage treatment plant upgrades; 4) harbormaster/waterways regulations to better address discharge wastes and other pollution from boats; 5) stormwater requirements within local subdivision regulations and the special permit process which are designed to meet the state water quality standards; and 6) modifications to the existing wetland regulations to expand the no disturbance/no build regulations in buffer zones to the ACEC and coastal tributaries.

The stormwater management plan and CPCC report has resulted in dramatic improvements in water quality in Ipswich waterways. Evidence of success is apparent in the re-opening of two clam flats in Fox and Treadwell Island Creek that have been historically closed to harvesting by pollution.

Selectmen have gone through the report to identify recommendations still in need of action. To help evaluate the success of best management plans that have been put in place and to help better understand how money is being spent, the Selectmen are recommending follow-up water quality monitoring to determine results of the management planning.
Contact: Ipswich Conservation Office.

The Committee produced a final report, which identified the primary sources, transport mechanisms, and impacts of coastal pollution from fecal coliform and suggested ways to address these impacts

Stormdrain Stenciling

With help from the Eight Towns and the Bay Committee, students and community groups in the ACEC Towns of Ipswich and Gloucester have stenciled the message "Don't dump. Drains to river/harbor/marsh" next to municipal storm drains. Storm drain stenciling is a fun and hands-on way to educate others and to promote voluntary action for pollution prevention. The stenciled messages, painted next to a municipal storm drain, alerts residents to the dangers of dumping items such as motor oil, pet waste, antifreeze, and trash into storm drains, where they are transported to local streams, rivers, and coastal waterways.

The stencils, featuring both the message and a fish graphic, are available on a loan basis to interested organizations and schools, free of charge, along with an information resource kit. In conjunction with the stenciling activity, many groups distribute an information sheet that lists items typically placed in storm drains, some of the effects these items have on marine life and water quality, and suggested solutions for addressing the problems. Studies have shown that stenciling works to raise awareness of pollution and stormwater runoff.
Contact: Eight Towns and the Bay Committee.

photo by Tom Kleindinst

Optical Brightener Handbook

Optical brighteners are fluorescent white dyes that are added to almost all laundry detergents to help make clothes look brighter. Because these dyes are a component of laundry effluent, they are generally found in domestic wastewater and can therefore enter the subsurface environment as a result of ineffective sewage treatment. Removal of the optical brightener dyes in groundwater is by adsorption (or attachment) onto soil and organic materials; in surface waters they are removed by adsorption and photo decay. Since adsorption is a critically important process in the performance of septic systems, the recovery of these dyes in nearby waters (either surface or groundwater) indicates ineffective natural cleansing of wastewater.

Two groups in the ACEC, the Ipswich Coastal Pollution Control Committee and the Gloucester Shellfish Department/Shellfish Advisory Commission, have found that Optical Brightener testing when done in combination with a larger sampling program reliably helps identify faulty septic systems, storm drain cross-connections, and human/animal waste differentiation. These two organizations produced an Optical Brightener Handbook that can be used by other water quality monitoring groups.
Contact: Eight Towns and the Bay Committee website at http://www.thecompass.com/8TB.

Water Quality Monitoring and Presentations

The Parker River Clean Water Association (PRCWA) began collecting water quality samples once a month throughout the Parker River Watershed beginning in the spring and continuing through the fall of 2000. Information was collected for temperature, dissolved oxygen, pH, fecal coliform, nutrients, turbidity, depth, and velocity at each sample site. An annual report summarizing the data was written and results were presented to conservation commissions in the towns of Newburyport, Newbury, and Rowley. These presentations have improved communications between PRCWA and conservation commissions in the watershed, and have encouraged local officials to seek public support for setting up additional water quality sampling sites in their town. PRCWA plans on continuing this sampling schedule and follow-up presentations to more watershed communities.
Contact: Parker River Clean Water Association.

Regional Boat Waste Management

Harbormasters from Newbury, Rowley, Ipswich, Essex, Gloucester, and Rockport convened in spring, 2000 to begin a process of coordinating pumpout facility activities on a regional basis. By working collectively, the harbormasters were quickly able to assess the capacity of pumpout boats and shoreside facilities in the region and develop a coverage strategy to best serve boaters throughout the area. For example, Ipswich agreed to take its new pumpout boat to Essex Bay to provide boaters with pumpout services that hadn't been accessible in years past. As boaters become more aware of the increased pumpout coverage, less waste will be discharged directly into ACEC waters of Plum Island Sound and Essex Bay.

With coordination from CZM, the Harbormasters also assisted in developing information for public education and pumpout promotion materials for distribution in the summer of 2001. This outreach campaign is based on information needs identified by the harbormasters, includes formats most usable by boaters in the region, and incorporates ways to build a regional identity for the ACEC waters. Concurrently with these efforts, CZM conducted a boater

survey to gather information about pumpout use and how it could be made more accessible. This information has been compiled into a Regional Boat Waste Pumpout Plan (Brown 2001) that promotes pumpout use through public education.

The boat waste management initiative serves as a model for promoting regional collaboration to assess and meet the needs of recreational boat users and provides an example of how municipalities can join forces to meet challenges through cooperation and planning. By working within a regional framework, services are better provided to a full spectrum of boaters regardless of jurisdictional boundaries.
Contact: Coastal Zone Management, North Shore Regional Office.

SHELLFISH RESOURCES

Marine Resource Advisory Board

The Rowley Marine Resource Advisory Board was appointed by the Board of Selectmen in August, 1999 to act as advisors for the Shellfish Commissioners, Shellfish Constable, and the Selectmen on the management of Rowley's marine resources, especially the clam flats, and to explore the viability of aquaculture for the town. With impetus from the Metropolitan Valley Planning Commission's (MVPC) shellfish enhancement project (see next case study), the board was established in response to concerns over shellfish declines and low commercial license sales.

The Advisory Board aims to: 1) develop a comprehensive long-term shellfish management plan; 2) research and implement feasibility studies to stabilize the fluctuations of the resource; 3) implement other marine resource aquaculture programs; 4) work in cooperation with neighboring ACEC towns trying to address similar aquaculture issues; 5) continue the shellfish enhancement program using nets and short-term predator control; and 6) develop a control program for existing flats (Mehaffey 2000a). Enforcement of the existing by-law concerning flat closures in over-harvested areas is another priority. The Marine Resource Advisory Board is a successful example of how a group of volunteers can organize, with the help of regional planning organizations, to address resource issues in their town and cooperatively with other towns throughout the ACEC.
Contact: Rowley Conservation Office.

The Marine Resource Advisory Board is a successful example of how a group of volunteers can organize, with the help of regional planning organizations, to address resource issues in their town and cooperatively with other towns throughout the ACEC.

Shellfish Enhancement Project

A multi-year shellfish aquaculture research project was launched on the North Shore in 1995 by a partnership of the MVPC, Eight Towns and the Bay, the Northeast Massachusetts Aquaculture Center, and the municipalities of Gloucester, Rowley, and Ipswich. The goal of this project is to research the feasibility of rearing soft-shell clams for both private aquaculture and public stock enhancement by investigating two techniques of hatchery production and wild seed (or young clam) harvesting. Several types of experimental seed catching nets have been deployed at eight locations in Gloucester, Rowley, and Ipswich. The nets function by allowing clam larvae in the water column to settle and grow under the nets, while protecting them from predators. Based on previous research, it is expected that the nets will capture and protect many thousands of naturally produced young clams that would otherwise perish due to predation and other types of mortality. These clams can then be thinned and the excess transplanted to under-productive or non-productive shellfish areas.

Since the early 1990s, these shellfish enhancement efforts have resulted in an increase in take by both professional and recreational shellfishermen. This regional effort demonstrates an ongoing initiative that benefits local resources and economies while addressing management needs and reducing strain on over-harvested areas throughout the ACEC region.
Contact: Merrimack Valley Planning Commission.

WETLANDS

No Build/No Disturb Zone

Pursuant to the Ipswich Wetlands Protection Bylaw and Rules and Regulations, the Ipswich Conservation Commission has jurisdiction on land within 150 feet of the ACEC, which exceeds requirements of the state's wetlands regulations by adding an additional 50 feet to their review. Projects proposed in the area within 150 feet of the ACEC shall be required to demonstrate that potential impacts to the ACEC by the proposed project are mitigated. In evaluating the effect of activities proposed in this 150 foot buffer zone, the Commission is required to review short-term, long-term, and cumulative effects on adjacent resource areas. Any adverse effect shall be minimized through compliance with particular performance standards. As part of these performance standards, the Commission recently amended requirements of the No Build/No Disturb Zone. Wetlands regulations now establish a 50 foot No Disturbance Zone and a permanent 15 foot No Build Zone (landward of the No Disturb Zone) on all projects in the buffer zone, thus preventing building within 65 feet from a wetland resource area. The existing performance standards and potential modifications exceed the standards used by other towns in the ACEC and can serve as a useful model for implementation.
Contact: Ipswich Conservation Office.

Wetland Exclusion From Lot Area Calculations

Essex is the only town within the Parker River/Essex Bay ACEC that has succeeded in excluding 100% wetland area from the lot area definition.

The lot area definition within the Essex Zoning Bylaw was recently amended (annual town meeting - May 2, 2000) to add that bogs, tidal marshlands, and other forms of wetland be excluded from lot area calculations. This new definition will affect new subdivisions by specifically requiring only the area of uplands to count toward minimum lot size, thereby reducing the number of lots that are predominantly wetlands and ultimately reducing the number of dividable parcels. Essex is the only town within the Parker River/Essex Bay ACEC that has succeeded in excluding 100% wetland area from the lot area definition. Many other towns have only been able to exclude a certain percentage, such as within the Agricultural-Residential District Regulations of Newbury, which require not more than 20% of the minimum lot area to be in wetlands and similarly, in the Rowley Floodplain and Watershed Protection District Regulations, which require not more than 25% of the lot area to be floodplain or watershed protection land. With the 100% exclusion of wetlands in lot area calculations, Essex has taken an innovative approach for managing growth adjacent to sensitive wetland resources.
Contact: Essex Conservation Commission.

Wetland Performance Standards: 300 foot ACEC Buffer

The Gloucester General Wetlands Ordinance goes beyond the state's Wetlands Protection Act 100 foot buffer requirements by giving the conservation commission jurisdiction of a 300 foot buffer around the ACEC boundary. Within Section 12-10-1 of the Wetlands Ordinance, land extending 100 feet horizontally outward from the boundary of the ACEC, termed "Upland Edge,"

is referred to as a Resource Area and subject to protection under the article. Any activity proposed or undertaken within 200 feet horizontally outward from the Upland Edge is also subject to regulation. Certain performance standards are required, such as no vegetation cutting (other than existing lawns, flowers, vegetables, crops, and ornamental shrubs) within the Upland Edge, no additional impervious surface to land within the Upland Edge, and no components of any drainage system or septic system installed within 200 feet of the ACEC. The 300-foot jurisdictional area adjacent to the ACEC boundary is unique to Gloucester and is a significant regulatory step towards ACEC resource protection.
Contact: Gloucester Conservation Office.

Isolated Land Subject to Flooding

The Massachusetts Wetlands Protection Act defines isolated land subject to flooding as a wetland resource area, but many projects that alter less than the threshold limit would not be subject to review by the conservation commission or by the Department of Environmental Protection. In order to exert more authority over this type of resource area, the City of Gloucester recently passed an amendment to the General Wetlands Ordinance that reduces the state's threshold size from 5,000 to 2,500 square feet. The amendment stems from concern that these areas, once falling below the 5,000 square foot threshold for review, still serve valuable public interests such as pollution and storm damage prevention, surface and groundwater supply, and unique wildlife habitat. With the 2,500 square foot reduction in the threshold size now triggering review, there is an opportunity to ensure proper development and preservation of these isolated wetlands.
Contact: Gloucester Conservation Office.

Salt Marsh Science Classroom Project

Since 1996, students in grades 5-12 on the North Shore have been working with Massachusetts Audubon Society scientists to learn exciting and important information about salt marshes and Phragmites Australis (Common Reed), an invasive plant that grows in salt marshes. Some of the activities students have been involved with include: monitoring the growth of Phragmites in salt marshes; studying the effect of salinity levels on the growth of salt marsh vegetation; assessing tidal restrictions (places where natural tidal flow has been obstructed by human actions); and sampling fish above and below tidal restrictions to determine the impact of these restrictions on fish. Students and teachers from Pine Grove School in Rowley and Ipswich High Schools have been participating in the study. The information collected in this project helps scientists advise local, state, and federal agencies about how to protect and restore salt marshes (MAS 2001).
Contact: Massachusetts Audubon Society.

OPEN SPACE AND GROWTH MANAGEMENT

Land does not need to be developed to contribute financial resources, such as tax revenue, to the well-being of a community. A study by the Trust for Public Lands finds that while protecting open space costs money in the short-term, development ultimately means higher taxes in the long-term to maintain additional municipal services. Open space has long-term, positive, net fiscal benefits including savings on public service expenditures, enhanced property valuation, water resources protection, pollution control, hazard mitigation, and an improved bond rating (ECGA 1999). Open space also has a positive long-term

photo by Bruce Carlisle

Open space has long-term, positive, net fiscal benefits including savings on public service expenditures, enhanced property valuation, water resources protection, pollution control, hazard mitigation, and an improved bond rating.

net economic benefit for communities, including support for the tourist industry, creation of recreational opportunities, preservation of water-based industries, protection of the agricultural industry, and corporate retention and relocation (ECGA 1999). The case studies cited below are examples of how communities have tried to reach a balance between the protection of open space and the opportunity for appropriate growth and development.

The case studies cited below are examples of how communities have tried to reach a balance between the protection of open space and the opportunity for appropriate growth and development.

Growth Management Steering Committee

To address issues of growth management and loss of open space, the Town of Ipswich formed a Growth Management Steering Committee, which consists of 24 people representing diverse areas of interest and expertise in the town, including affordable housing, open space preservation, water resources protection, business, real estate development, and local government. This group began meeting monthly in August of 1999 and took as its mission the following:

> *To assess the current residential and commercial impacts upon the natural, constructed and municipal capabilities of the town, to anticipate the growth of such impacts, and to devise comprehensive municipal policies, techniques, and incentives – both voluntary and mandatory – that will guide the growth of Ipswich in a manner responsive to our Community Vision (Community Design Partnership 2000).*

The Committee also participated in the prioritization of open space parcels and sponsored three civic forums regarding the community's vision for its future. Forming committees such as these can benefit a town by encouraging cooperation, communication, and by building support for local growth management initiatives.

Contact: Ipswich Planning Department.

Open Space Inventories

Ipswich Inventory and Prioritization of Parcels

The Ipswich Open Space Committee obtained funds to identify and prioritize open space parcels based on a set of criteria used to assess resource values. Public water supply, marsh fringe, forest, wildlife habitat and corridors, scenic and cultural character, and contribution to recreational resources are some of the criteria being used to inventory the town's open space. The resulting inventory prioritizes parcels for protection and acquisition. This plan is being used to support the town's growth management plan and a $10 million bond authorization for the acquisition of open space. The list of priority open space properties is unique to the ACEC region and is on file at the town clerk's office.

Contact: Ipswich Planning Department.

Massachusetts Audubon Society's Critical Habitats and Open Spaces

The Massachusetts Audubon: North Shore (MAS:NS) office is developing a comprehensive inventory of important natural communities such as salt marsh, vernal pools, lakes and ponds, rivers and streams, and barrier beaches and dunes on Cape Ann. As part of this inventory, MAS:NS is identifying unprotected open space in Rockport and Gloucester and highlighting areas without adequate resource protection.

Volunteer support for the inventory is critical to its success from beginning to end. After working with staff biologists to determine criteria for each natural community, MAS:NS staff publicized the project to enlist the help of regional naturalists and environmental groups and announced the project in The Gloucester Daily Times to invite all citizens to participate in the inventory.

After volunteers completed inventories and verified sites with MAS:NS staff

biologists, the identified natural community's flora and fauna were catalogued and mapped to show where Cape Ann critical habitats are located. Final products are being used to hold workshops and conduct field trips for municipal officials and interested citizens to increase their enthusiasm and understanding for protecting the nature of Cape Ann. This project illustrates a successful way to involve the public in identifying unprotected, ecologically valuable land for future planning efforts.
Contact: Massachusetts Audubon Society.

Open Space Acquisition

Rowley Land Acquisition: Hunsley Hills

The 104 acre parcel known as Hunsley Hills is one of the largest undeveloped pieces of land in Rowley and is now permanently protected because of actions taken at town meeting to approve the property purchase at a value of $1.25 million. The town now owns and manages the property in perpetuity for the purposes of water supply and watershed protection, conservation, and low-impact recreation. Protection of Hunsley Hills will create a contiguous corridor of conservation land covering nearly 500 acres made up of an assemblage of land owned by the conservation commission, Rowley Water Department, Girl Scout Camp, other town-owned land, and land donated by developers (Trust for Public Land 2000).

Hunsley Hills was identified as a top priority for protection in Rowley's 1998-2003 Open Space and Recreation Plan. The success of the land acquisition project can be credited to the support and leverage that the town gained from conservation groups, funding sources, and state agencies with expertise in marketing and land acquisition techniques. A strong coalition supporting the acquisition project was built by meeting with the planning board, finance committee members, water board, conservation commission, and board of selectmen. Using the power of public media, such as letters to the editor or press releases, the open space committee publicly advertised and marketed the project with facts on the land to be acquired, partners involved, and estimated costs. From its experience, the committee learned the value of preparing a concise multimedia presentation for town meeting that included graphs, maps, photographs, and figures for cost estimates, as well as facts addressing community concerns, such as taxes, traffic, water quality, building rates, impacts on schools, and recreational opportunities.

The success of the land acquisition project can be credited to the support and leverage that the town gained from conservation groups, funding sources, and state agencies with expertise in marketing and land acquisition techniques.

Rowley's Open Space Committee has become even more empowered with the aid of a Conservation Land Fund that is augmented yearly with $20,000 from the town (per request) and brings the potential for leveraging other sources of matching funds. Approximately $100,000 was spent recently for acquisitions totaling 125 acres. This funding source, combined with the collaborative efforts illustrated in the Hunsley Hill acquisition process, have proven to be effective tools for protecting and managing open space. Another success from the Hunsley Hills acquisition project is that the town's Finance Committee has decided to allocate $50,000 toward acquisition each year from its operating budget.
Contact: Rowley Open Space Committee.

Ipswich Land Acquisition: $10 Million Bond Authorization

In an effort to preserve open space, protect water supply, and provide recreational opportunities, a majority of voters at the Ipswich annual town meeting (April 2000) agreed to borrow up to $10 million to protect open space either by outright acquisition or by obtaining a deed restriction on its use (Laidler 2000). The town showed tremendous commitment to preserving open

Much of the public support for the bond was generated from a series of civic forums that the town held to help the community envision its future.

space by creating this large fund with a Proposition 2½ override. Much of the public support for the bond was generated from a series of civic forums that the town held to help the community envision its future.

The measure names the Selectmen as the authority that decides when to borrow the money for land purchases and when to sell portions of open space parcels with proceeds going toward debt service on the bond. Thus, the fund gives the town the flexibility to act quickly and compete with other buyers when valuable parcels become available, particularly Chapter 61A lands, which are part of a tax reduction program for agricultural lands. If the town does not necessarily want to take full title to the land in order to protect it, less money can be used by purchasing conservation easements and development rights. Several committees are involved in selecting properties the town tries to buy, while the open space committee is leading an effort to prioritize properties and determine the best forms of protection.
Contact: Ipswich Planning Department.

Conservation Restrictions

Conservation Restrictions (CRs) are legal agreements between a landowner and a conservation organization or government agency that extinguish some or all development rights over a property. Even though CRs usually do not open land for public use, they serve valuable public interests such as protecting scenic byways, wildlife habitat, and productive farmland. CRs may bring property tax relief and income real estate tax benefits while keeping family land intact, preserving critical open space, and setting examples for neighborhood preservation.

Rowley Conservation Restriction: Minister's Woodlot

The Rowley Historical Society believes the 22 acre "Minister's Woodlot" is one of the oldest unchanged private lots in continuous use in America. This forested portion of land provides an important buffer between Route 1A and the ecologically sensitive ACEC salt marsh. A proposed development on 2 1/2 acres threatened to change the use and alter the landscape after 340 years. In response, the Town of Rowley, the Massachusetts Audubon Society, Essex County Greenbelt Association, Rowley Realty, the Rowley Historical Society, and an anonymous donor joined forces to secure a payment of $110,000 to the church trustees in order to obtain a Conservation Restriction (CR) on the entire lot (Blake, 2000). The church retains ownership and management responsibilities of the property, which will be accessible to the public for passive recreation, while the town and the Massachusetts Audubon Society make certain that the land remains protected. Seeing as the lot is bounded almost entirely by other conservation land, the procurement of the conservation restriction has also helped establish wildlife corridors and prevent fragmentation of open space.

This case study illustrates the importance of protecting land with multiple resource values, forming a collaboration among interested parties and landowners, and obtaining the technical assistance and support of land trusts and organizations with professional staff.
Contact: Rowley Conservation Office.

Community Planning Forums

Gloucester Community Development Plan 2000 Committee

To address their city's future, Gloucester volunteers and city staff are in the process of writing a 10 year community development plan. The Community Development Plan 2000 Committee has been gathering public opinion about

concerns in Gloucester through a series of meetings and have spent nearly a year collecting data and information to support the plan. Thus far, Gloucester residents report that, "protecting natural areas – from shorelines to woods, marshes to meadows – is a chief concern of those who live here" (GDT 2000). Group discussions about protecting open space focus on privately held tracts of land that could be developed, but presently remain undisturbed. Planning ideas for these tracts of land include acquisition and conservation easements or restrictions. The Community Development Plan is viewed by residents as an opportunity to tackle important natural resource issues.
Contact: Gloucester Planning Board.

The Future of Ipswich Planning Project

The *Future of Ipswich Planning Project* began in 1999 as a town initiative to respond to citizen concerns about trends in the amount, location, type, and design of new development and growth in the town. Officials decided to provide limited funding for a consultant team to begin a growth management planning process with a visioning component and to prepare studies on open space issues. The goal of this planning project is to help the residents, business owners, and property-owners in Ipswich agree on a vision for the town's future, a strategy to make the vision a reality, and action steps to implement the strategy. A visioning civic forum was held in January, 1999 to elicit elements for a Vision Statement that the town can use as a goal when developing its growth management plan. By developing and implementing a growth management plan that directs and shapes change to enhance and promote the town's goals, Ipswich will be able to protect and preserve the places and characteristics that its citizens cherish. The creation of a vision for the future begins the process and starts the town-wide conversation about how to make the vision a reality.
Contact: Ipswich Planning Department.

The goal of this planning project is to help the residents, business owners, and property-owners in Ipswich agree on a vision for the town's future, a strategy to make the vision a reality, and action steps to implement the strategy.

Land Protection Assistance

Great Marsh Land Protection Assistance

As part of Massachusetts Audubon Society's Great Marsh Initiative, the Land Protection Team brings together agencies and conservation organizations to work collectively to restore and protect open space in towns from Salisbury to Gloucester (including all five ACEC towns). The Team is committed to helping individuals, local governments, and public access groups acquire, protect, and manage land. As part of this effort, the Team has created an *Assistance and Technical Services Request Form* that encourages all communities, groups, and individuals to request assistance from the Land Protection Team. Assistance is available in the following areas: acquisition, planning and assessment, outreach and education, resource inventories, and ACEC boundary, project review, and resource mapping questions.

After a developer of the Winchester Farm Estates in Ipswich submitted a design for a 20-lot standard subdivision in 1997, he was encouraged by the town's planning board to consider an open space residential design as the property contains over 36 acres of woods, wetlands, and a cranberry bog. In response to a May 1999 request, the Land Protection Team compiled a list of design firms and individuals who have experience with open space residential design development from a member of the Ipswich Open Space Committee. After receiving a recommended list from the Land Protection Team, the developer hired Randall Arendt, a nationally known open space designer, to develop a plan for the property. The plan now locates 20 houses on 15 acres of land, leaving 20 acres of preserved cranberry bogs, forested knolls, and all the property's wetlands. A present trail system will take residents from their homes to the preserved areas

…the Team has created an Assistance and Technical Services Request Form that encourages all communities, groups, and individuals to request assistance from the Land Protection Team.

and into the Willowdale State Forest. The conservation land will be deeded either to the town or a conservation land trust like Essex County Greenbelt Association. Although lot sizes will be smaller than in a conventional subdivision, the developer is allowed to build more houses with greater density under the town's open space zoning bylaw. Arendt's development plan also calls for an innovative "natural drainage system" which uses vegetated retention ponds rather than traditional pipes, curbs, and catch basins. This plan is being praised by multiple stakeholders including the property owner, abutters, the planning board, and the developer.
Contact: Ipswich Planning Department, Masschusetts Audubon Society.

Essex County Greenbelt Association Land Protection Programs

The Essex County Greenbelt Association is a non-profit organization dedicated to preserving the open space heritage of Essex County. Since 1961, Greenbelt's land programs have helped local communities and landowners to safeguard ecosystems, foster agricultural usage, and protect scenic vistas and special natural features. One of the organization's goals is to create a network of "greenbelts" consisting of river, coastal systems, visually intact landscapes, and trail and other natural corridors. Greenbelt offers information outlining protection measures and options that would best suit landowners and they have been successful in protecting nearly 10,000 acres of land in Essex County. Throughout the interviews for this assessment, many local officials indicated that Greenbelt is a valuable resource for information dissemination and is highly successful in negotiating open space acquisitions.
Contact: Essex County Greenbelt Association.

Grow Smart North Shore

At the request of the MAPC North Shore Task Force, a team of twelve graduate students at the Harvard Graduate School of Design investigated ways that new patterns of growth could be encouraged in North Shore communities. The goal of the study was to identify ways that the region can promote smarter development patterns with strategies and investments that preserve the area's remaining open space and rural character while reinforcing its economy and quality of life. Through work with local officials and organized public workshops, the team produced a document, containing regional maps, entitled Grow Smart North Shore that describes an open space protection strategy, ideas for improving patterns of development, a buildout analysis, and suggestions for implementing land protection strategies (HUGSD 1999). In preparing recommendations for implementation, the team sought to: 1) consider the needs and character of the region's resources and people; 2) consider the needs of the regional ecology; 3) address the issue of water quality and quantity; 4) address the rich cultural heritage of the region; and 5) create a realistic, regional open space reserve on the North Shore and Cape Ann (HUGSD 1999).

Analyzing the distribution of regional resources ultimately led to the identification of certain key areas in need of immediate preservation (for a series of maps highlighting these areas see the final report cited as HUGSD 1999). Input from formal and informal meetings with North Shore residents was critical in formulating the proposals in Grow Smart North Shore and important first steps for attaining regional cooperation.
Contact: Metropolitan Area Planning Commission (MAPC).

Green Neighborhoods Alliance: Open Space Residential Design

Through a collaborative design process, a diverse group of North Shore constituencies known as the "Green Neighborhoods Alliance" have worked to produce and promote an Open Space Residential Design bylaw. Otherwise known as Conservation Subdivision Design and modeled after the work of Randall Arendt, this technique aims at building desirable neighborhoods by maximizing the amount of preserved open space without reducing the number of homes built. The Alliance is the first land use partnership in Northeast Massachusetts to successfully include local and state governments, regional planning agencies, conservation organizations, developers, engineers, and realtors.

The process uses the following four steps to balance environmental and development needs during subdivision planning: 1) identify priority conservation areas for protection; 2) site houses to avoid these resource areas and to maximize views and other marketable amenities; 3) lay out roads to minimize length (less natural disturbance and cost); and finally 4) draw lot lines. This approach differs from traditional "cluster" development because a creative working relationship among divergent groups, such as developers, planners, and conservation organizations, is established at the conceptual stage of the process. Early on, these groups try to address environmental concerns and offer innovative economic incentives to developers without a cumbersome review process. The result is a "neighborhood" design with smaller, more intimate lots surrounded by shared open spaces, which protects natural resources while encouraging residents to become more integrated into the community.

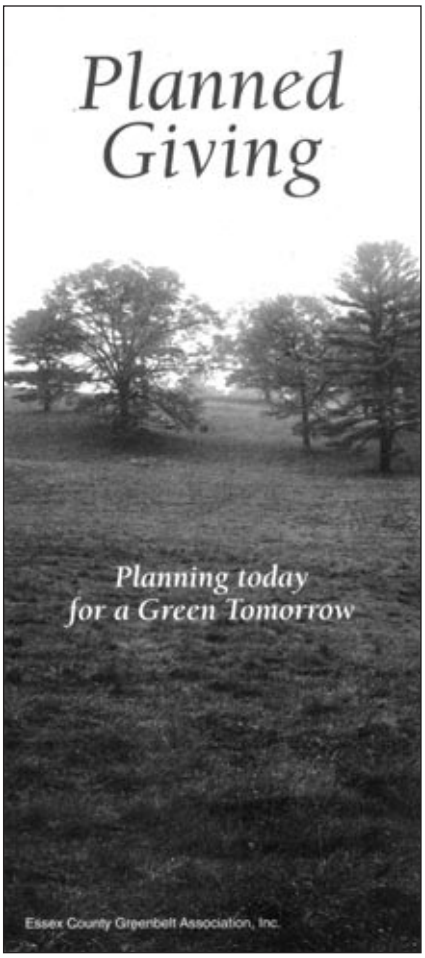
Essential to the project's success is an outreach program that includes the use of brochures, fact sheets, slide shows, and other associated education materials, as well as many workshops and forums. Even more important to the success is the extensive staff time commitment from local and state governments, regional planning agencies, conservation organizations, builders, engineers, and realtors. These professionals have donated many hours to meetings, review of technical documents, and submission of comments on both regulatory and nonregulatory tools in order to promote this innovative residential development strategy. This model is being transferred to other communities showing interest in learning about the innovative approach.
Contact: Massachusetts Audubon Society.

The Alliance is the first land use partnership in Northeast Massachusetts to successfully include local and state governments, regional planning agencies, conservation organizations, developers, engineers, and realtors.

TECHNICAL ASSISTANCE AND INFORMATION SHARING

A Citizen's Guide to the Project Review and Approval Process

The Ipswich Department of Planning and Development produced an information guidebook (1999) to assist the public in understanding the process of obtaining necessary development permits in Ipswich. It summarizes the town's project review and approval process, defines the roles that each local regulatory board plays in that process, and sites the relevant sections of the town's bylaws to reference for more detailed information. By using the guidebook, the public may become more aware of the regulatory requirements, the permit process, and the need to address resource protection issues within permits and plans.
Contact: Ipswich Planning Board.



Brochures

Brochures target a large number of stakeholders, such as landowners, boaters, clammers, and recreational tourists who use and benefit from resources but who may not be aware of the large number of protection efforts underway. A well-targeted education and outreach campaign to these stakeholders will build support for resource protection. The Ipswich River Watershed Association has distributed brochures, including "How Animal Wastes Pollute Our Waters" and "A Resource Guide to Pasture and Manure Management." The Towns of Rowley and Ipswich have created brochures summarizing the purpose behind the Wetlands Protection Act and the Local Wetland By-laws and how they are implemented through the local conservation commissions. The Town of Ipswich Coastal Pollution Control Committee has distributed brochures to educate the public on sources of pollution to and protection mechanisms for the Ipswich River. The Essex County Greenbelt Association has put out an informational brochure entitled "Open Space in Essex County: Understanding the Fiscal and Economic Benefits for Your Community." These brochures have been and can be distributed through numerous avenues depending on the subject matter (e.g., when sending out dog tag license renewal forms or direct mailings to landowners within the ACEC boundary). Many stakeholders are on mailing list, so they can be effectively engaged with direct mailings if appropriate. These groups include, but are not limited to: commercial or recreational shellfishermen, lobstermen, recreational boaters, tourist-oriented businesses, seafood processing companies, coastal homeowners associations, municipal waterways and harbors staff, and boards and commissions.
Contact: Coastal Zone Management, North Shore Regional Office.

Newspaper Articles, Cable-Access Television, and Videos

Writing about the ACEC or natural resource issues in local newspapers is another way to reach the general public. By focusing articles on diverse topics, such as the importance of clamming, migratory fish, water quality, and recreational boating, the public can learn about the importance of these resources to the economy, environment, public health, and recreation in the region. Writing for local papers has shown to be an effective tool for public education.

The Ipswich Planning Board has a local cable program where they discuss every article on the warrant for upcoming town meetings. During this program, citizens can call and ask questions that better prepare themselves for town meeting. This format is a useful way to educate the public and advocate for resource protection in the ACEC.

The Eight Towns and the Bay Committee has produced a video about the Great Marsh entitled, *Voices of the Great Marsh*. This video is being distributed at a variety of locations including libraries, town halls, historical societies, and will be aired on local cable television. The video presents a historical and contemporary portrait of the Great Marsh through the voices of those who have worked to restore and protect if for future generations.
Contact: Coastal Zone Management, North Shore Regional Office; Ipswich Planning Department; Eight Towns and the Bay Committee.

Coastal Communities Toolbox

A collection of tools and resources available to coastal communities is highlighted in CZM's document entitled *Coastal communities toolbox: innovative strategies for addressing growth, water quality, and other environmental issues.* The report describes several models and programs designed to provide municipalities, their boards and commissions, and local volunteers with "real world" tested tools and

strategies for addressing coastal management issues. Four categories of CZM resource management programs are described: 1) planning for development, 2) water quality, 3) coastal access, and 4) special area management. The text provides guidance for implementing programs, lessons learned, as well as strategies for multi-disciplinary and multi-jurisdictional partnering. The document highlights local and regional partners active in resource management and the benefits of partnering for information sharing, technology transfer, and problem solving to help eliminate the adage, "I can't do this alone", and replace it with "we can do this together".

Ideally, users of this document include planners, conservation agents, health agents, volunteer boards and commissions, developers, regional agencies, and any other entity engaged in local and regional resource management issues and planning for growth. One unique feature is the inclusion of strategies aimed at teambuilding between traditionally adversarial parties such as developers and local regulatory bodies. Thus, the document is designed for wide circulation and accessibility to users with a wide range of skills and resources in coastal watersheds.
Contact: Coastal Zone Management, North Shore Regional Office.

Local Network Meetings

The CZM North Shore Regional Office facilitates several "network" meetings, which bring together members and administrators of similar boards and commissions for topic specific technical assistance, information sharing, and group problem solving. The conservation commission and health networks meet monthly for discussion, regulatory questions, and to receive information from a variety of sources including state agencies, environmental organizations, and private environmental consulting groups. In addition, CZM, Massachusetts Audubon, and the Essex County Greenbelt Association recently partnered to form an Open Space Committee Network that meets on a quarterly basis. Members of regional open space committees gather to discuss and receive technical assistance about issues concerning open space inventory, funding, and mapping. These network meetings have proven to be a successful way of educating municipal officials and volunteers about a variety of topics and have led to more effective decision making at the local level.
Contact: Coastal Zone Management, North Shore Regional Office.

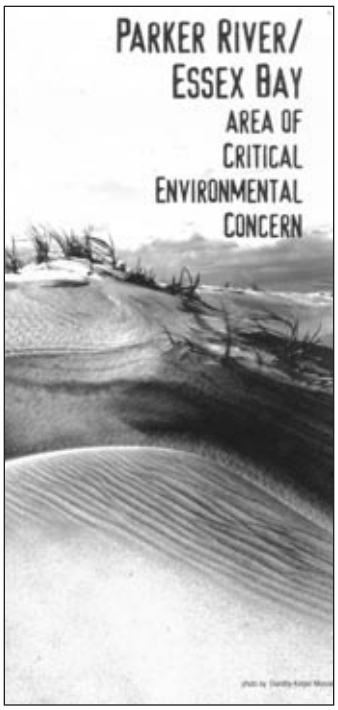
ACEC Letter and Brochure Mailing

The Rowley Conservation Commission identified parcels and compiled an address list for landowners within the ACEC boundary. By working with the CZM North Shore Office, they then drafted a letter to send along with the ACEC brochure to these landowners. The letter identified threats to natural areas in the ACEC, discussed what it means to be living with the ACEC in their "backyard," and described the economic, ecological, and cultural significance of ACEC resources to the town. The goal of this mailing was to increase support of ACEC stewardship efforts and encourage appropriate management of these special areas.
Contact: Coastal Zone Management, North Shore Regional Office.

Great Marsh Natural Resource Mapping

The Great Marsh Land Protection Team has created a tool to help North Shore communities identify and prioritize areas for natural resource protection. As part of this process, natural resources in the Great Marsh and surrounding watersheds were illustrated in a series of three maps: 1) natural resources, 2) natural resource overlap, and 3) natural resource overlap and open space

These network meetings have proven to be a successful way of educating municipal officials and volunteers about a variety of topics and have led to more effective decision making at the local level.



protection. The first two maps are used to locate important areas such as surface waters, wetlands, floodplains, forests, and wildlife habitats and to guide protection and restoration efforts by illustrating where these resource areas overlap. The third can be used to identify areas of high resource overlap that are within designated permanent or temporary protected open space. A set of "ecological guidelines" drafted by regional ecologists is included with each of the maps to help users think of ways to use and interpret the data to improve resource management both at a regional and local level. Ground-truthing at the local level will increase each map's accuracy and help add new information to regional, state, and federal databases. Since maps give people a sense of how local resources are part of a larger ecosystem, they can be displayed at a variety of public locations, meetings, and workshops to demonstrate how activities in one community can affect resources in neighboring towns.

Contact: Coastal Zone Management, North Shore Regional Office.

V. Regional And Local Strategies For Action

As seen through the many case studies documented in this report, the five municipalities and regional partners in the Parker River/Essex Bay ACEC have been making great strides in meeting their environmental protection goals. Whether it be preservation of community character, protection of wetland resource areas, or addressing polluted stormwater runoff, these efforts promote protection and stewardship of the ACEC and natural resources in surrounding communities. However, despite these positive steps taken, some of the resource issues previously described still need to be addressed. The strategies highlighted in this section can help the communities and partners involved take additional steps forward. Ultimately, it is up to local governments to decide which actions are most appropriate, realizing regional organizations and agencies can offer technical assistance and funding.

To identify strategies for local and regional resource management, CZM began by reviewing existing zoning bylaws, planning board rules and regulations, and wetland bylaws in each of the five ACEC municipalities. Based on this review, the *Table of Local Regulatory Strategies* in Appendix B was compiled. This table provides more detail about local bylaws and regulations and shows how each municipality's approach to resource protection compares to others in the region. CZM also interviewed local officials and volunteers to gather their suggestions for resource protection strategies and needs both in their town and the region.

By evaluating information from local interviews, highlighted case studies, and existing regulatory approaches for each town, CZM compiled the information in this chapter that begins with strategies that regional partners can consider to further assist ACEC communities. The next section identifies strategies at the municipal level that are consistent for all five ACEC communities. Readers interested in local resource management ideas should also review the final information presented in *Strategies for each ACEC Municipality,* which recognizes the differences between community needs and focuses on strategies specific to each of the five ACEC municipalities. *Key words are put in bold to help the reader quickly identify the main topic, while related case study page numbers are identified where appropriate to help the reader navigate through this document.*

REGIONAL PARTNER STRATEGIES

Throughout this assessment there are many examples of successful partnerships that are key to ensuring resource protection at a regional level. Regional organizations and agencies are taking a proactive role in helping communities develop and implement effective management strategies. This section identifies additional opportunities for regional groups to provide coordination and technical assistance that support local and region-wide efforts to address environmental issues throughout the ACEC.

Regional partners bring distinct skills and informational resources to communities. Some can offer help in organizing forums and in enhancing participation, while others can assist in the planning process, bringing a menu of innovative tools and strategies that towns can explore to plan for their future. Regional groups are uniquely positioned to provide this kind of support because

their focus transcends municipal boundaries, allowing them to better implement regional solutions. For many of these strategies, it makes sense for regional groups to develop tools and strategies that can be used multiple times by different communities, thus encouraging consistency throughout the region. Strategies for regional groups to help address issues of water quality, open space and growth management, and information sharing are given below.

Water Quality

Regional groups can pursue the following actions to help communities address water quality concerns:

Pages 22 & 24 →

✓ Hold stormwater workshops for local officials (planning boards, conservation commissions, and department of public work officials) to help assess and select appropriate technologies and resolve issues about the use and maintenance of stormwater management practices. *See case study: 1) stormwater performance bond and 2) Coastal Pollution Control Committee.*

Page 21 →

✓ Transfer tools being developed from CZM's Parker River Watershed pilot **Nonpoint Source Monitoring and Analysis Framework** to other ACEC watersheds. These tools can be used to assess the effectiveness of pollution control measures, identify relationships between development patterns and aquatic resource quality, and determine areas where additional monitoring stations should be sited. *See case study: Parker River Watershed nonpoint source monitoring and analysis.*

✓ Work with landscape architects to develop outreach materials and hold workshops to educate community leaders and the public on how to use water-efficient/drought-resistant plants, limit lawn size, plant buffers to reduce runoff, and implement other **environmental landscaping techniques** to limit water use and improve water quality.

Page 23 →

✓ Provide technical assistance to agricultural landowners and stable owners in upper parts of the watershed to reduce water quality impacts through implementation of **agricultural best management practices.** *See case study: agricultural best management practices.*

Open Space and Growth Management

Regional groups can pursue the following actions to help communities address open space and growth management concerns:

Pages 33 & 34 →

✓ Provide communities with technical assistance and information for drafting and/or implementing **master plans and Executive Order 418 community development plans.** Examples of planning tools include Open Space Residential Design, Planned Unit Development (PUD), transfer of development rights (TDR), and mixed commercial/residential development to create neighborhoods, protect open space, and reduce transportation needs. *See case study: 1) Green Neighborhood Alliance – Open Space Residential Design and 2) Grow Smart North Shore.*

✓ Produce a **fact sheet about the cost of development versus the cost of open space protection** and distribute to ACEC communities. One barrier to open space protection is how a community views the short-term benefits of increased tax revenue without realizing the long-term infrastructure costs with new development. Regional partners can help overcome this barrier by making available accurate information about cost

differences to officials and interested citizens.

✓ Assist towns in **identifying and prioritizing parcels for open space acquisition,** finding funding sources to purchase open space, and developing a public awareness campaign to support local acquisition efforts. For example, regional partners can help local officials develop and use build-out analyses, resource maps, and Geographic Information System (GIS) data to inventory lands with exceptional resource value. *See case study: 1) open space inventory, 2) open space acquisition, 3) conservation restrictions, 4) community planning forums, and 5) Great Marsh natural resource mapping.*

Pages 29, 30, 31, 36

✓ Whenever possible, **organize regional planning efforts on an ecosystem/watershed basis** rather than along traditional jurisdictional boundaries. Services such as grant writing, mapping, master and open space planning, and promotion of shared resource protection including water supplies, can be more effective if offered on a regional, rather than town by town basis.

Technical Assistance and Information Sharing

Regional groups can pursue the following actions to coordinate and improve information sharing and technical assistance efforts:

✓ Schedule biannual or quarterly **ACEC network meetings** to help the five ACEC communities share resources, provide topic-specific training, package regional grants, and obtain the information and services needed to advance consistent ACEC protection and management for the region. Planning boards, open space committees, conservation commissions, and boards of health could find it useful to attend these meetings. As with other successful North Shore network meetings, one or more regional partners should coordinate and facilitate this ACEC network for local officials and their staff. *See case study: local network meetings.*

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✓ Compile a **packet for new conservation commission members** providing a variety of important information including contacts for technical assistance, handouts from the Massachusetts Association of Conservation Commissions, wetland delineation techniques, soils training handbooks, and information on higher performance standards within ACECs. When developing the packet, regional partners could work with local conservation commissions to identify and prioritize what information to include. For towns that do not have a full-time agent and cannot regularly attend workshops, regional partners could give presentations at commission meetings about topics of interest such as background information and enforcement procedures for the Rivers and Wetlands Protection Acts.

✓ Work together to produce and distribute a **document describing available regional services and assistance** available to communities. Such a document would help local officials access the appropriate organization/agency for technical assistance and thus help strengthen local and regional contacts.

✓ Help communities get up-to-speed with **current mapping technologies.** As GIS is being increasingly used as a planning tool, communities need technical assistance for such things as hardware/software, grant writing, resource mapping, and GIS training. *See case study: Great Marsh natural resource mapping.*

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✓ Where **environmental science and salt marsh curricula** are being used in public schools, help teachers broaden their efforts to include information on other important natural resources, such as estuaries, watershed, finfish/shellfish, and migratory birds. By discussing not only the ecological importance of these resources but also their recreational and economic significance, students will gain a greater appreciation of the ACEC as an entire ecosystem that crosses the political boundaries where they live. *See case study: salt marsh science classroom project.*

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✓ Work with local officials to increase the use of **brochures, newspapers articles, and workshops** to target stakeholders who use and benefit from ACEC resources. A well-targeted outreach campaign will build support for resource protection and increase awareness not only about the ecological significance of resources but also the economic, recreational, and cultural value they add to our daily lives. *See case study: 1) newspaper articles, cable TV, and videos, and 2) ACEC letter and brochure mailing*

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COMMON STRATEGIES FOR ALL ACEC MUNCIPALITIES

One size does not fit all when it comes to addressing local resource protection in each of the five ACEC towns. However, strategies highlighted in this section can have a positive impact in most (if not all) of the five ACEC municipalities. Implementing these strategies will help create a more consistent approach to resource protection and encourage local officials to work with other municipalities to address common issues on a region-wide basis. Contact the CZM North Shore Regional Office (978-281-3972) to get information about organizations and agencies that can provide the technical or funding assistance needed to help implement these strategies. Readers may also refer to the *ACEC Contact List* in Appendix A for additional information.

Water Supply

Communities can pursue the following action to address water supply concerns:

✓ Implement **water conservation methods** that include: restricting watering of lawns and gardens to limited days and hours; establishing a leak detection program as part of water department budgets; offering subsidies for water efficient plumbing; creating subdivision guidelines that list water-efficient plants for landscaping; and demonstrating environmentally friendly lawn and garden projects in collaboration with local Garden Clubs for interested citizens. *See case study: innovative water conservation techniques.*

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Water Quality

Communities can pursue the following actions to address water quality concerns:

✓ Prevent **stormwater problems from Approval Not Required (ANR) lots** by using the building permit process. ANR lots do not require planning board approval under the Subdivision Control Law because they have frontage on a town road, formerly approved subdivision road, or a road deemed passable by the planning board. However, development of these lots without review can have damaging stormwater impacts. To address this water quality problem, towns can require that project proponents submit erosion control measures and a stormwater management plan that address water quantity and quality as part of a building permit application. This

would allow a building inspector to seek input from the planning board about the effectiveness of stormwater and erosion practices before rendering a decision to grant or reject the building permit. *See case study: drainage plans for Approval Not Required lots.*

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✓ Establish realistic **annual budgets for long-term operation and maintenance of stormwater best management practices** such as storm-treat systems, detention basins, and vegetated swales. When new subdivisions are accepted at town meeting, access roads are approved with complicated drainage systems using new technologies. Department of public works budgets need to reflect realistic maintenance costs to effectively minimize stormwater problems. *See case study: stormwater performance bond.*

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✓ Continue improving the public's awareness about the need for and availability of **boat pumpout facilities** by working regionally to educate boaters in the area. Once boaters are comfortable with using pumpout facilities on a regular basis, municipalities may want to consider applying for a state No Discharge Area designation so that new and transient boaters will also use pumpout services and learn to appreciate the local value placed on ACEC waters of Plum Island Sound and Essex Bay. *See case study: regional boat waste management.*

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Open Space and Growth Management

Communities can pursue the following actions to address open space and growth management concerns:

✓ Consider options for community planning techniques that take advantage of available resources, guidance, and public involvement. *See case study: 1) growth management steering committee and 2) community planning forums.*

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- Use **"visioning" exercises as a tool for community development planning** to explore ideas and build consensus about your community's future. "Visioning" is a term to describe brainstorming and consensus building about desired community characteristics. Visioning exercises can be used to assist municipalities with prioritizing open space for protection, planning for town center revitalization, or developing a master plan or open space plan. A set of visioning forums are critical for enlisting public comments, reviewing future options for growth, engaging residents and businesses, and reaching consensus on planning goals and objectives. Thus, holding a visioning or community planning forum can help solidify local priorities for growth planning and open space protection. Visioning exercises are ideal ways for interested citizens to share ideas with one another, gain support for new initiatives, and give detailed input to local officials.
- Take advantage of funding and/or technical services through Executive Order 418 to prepare a **Community Development Plan.** Towns can create a scope of work for these plans after they receive a build-out map (a map showing the community at maximum development based on current local zoning and state laws) from the state's Executive Office of Environmental Affairs. Community development plans are designed to include long-term planning objectives for community preservation, housing, transportation, and economic development. Part of the planning process involves identifying the type, location, and quantity of open space including unprotected open space.
- Consider developing a **master plan** as another community planning option. Although master plans address similar objectives to Community

Development Plans, they are more comprehensive and include eight components that address land use, housing, transportation, open space and recreation, public facilities, economic development, natural and cultural resources, and implementation. Master plans encourage development most needed, discourage development not wanted, and site projects in appropriate locations. Without the guidance offered by a master plan, development will more likely occur in a haphazard manner. If a municipality has completed a master plan, they can use this document to fulfill requirements of their community development plan described above.

✓ Take advantage of the state's **Community Preservation Act** that authorizes a new revenue stream to assist towns with land acquisition. Three steps are critical to include in a strategy for land protection:

1. Establish an accounting mechanism to receive and disperse money from the Community Preservation Act's revenue stream. The open space committee, planning board, and conservation commission should work with the town accountant, treasurer, and finance committee to establish an appropriate mechanism.
2. Dedicate a portion of the town or city general operating budget each year for land acquisition. These funds, combined with the new Community Preservation revenue stream and grants, will increase the town's ability to purchase priority open space parcels in a timely manner.
3. Identify and prioritize key parcels for acquisition through either the Community Preservation Act or an open space plan.

Pages 29, 30, 31, 32, 36 ⟶

See case study: 1) open space inventory, 2) open space acquisition, 3) conservation restrictions, 4) land protection assistance, and 5) Great Marsh natural resource mapping.

✓ Work with regional planning organizations to **evaluate recently completed state buildout analyses** and discuss appropriate short and long-term community planning goals. Some towns are poised to move forward with developing formal growth management plans while others are at earlier, informal stages of discussing goals and planning community forums to gather information.

✓ **Update antiquated bylaws or regulations** that are no longer applicable or effective in addressing town issues and future goals. During the process of drafting a community development or master plan, the town would examine future directions for growth, economic revitalization, and natural resource protection. This is an excellent time to review existing bylaws and regulations, especially those that were adopted in the 1970s and 80s when the "one size fits all" approach was often touted as a growth management solution. The following questions could be addressed:

- Does your town have/need a variety of zoning and overlay zoning districts to meet your local goals and objectives?
- Does your town have an updated site plan bylaw? Do your bylaws and regulations allow adequate assessment of environmental impacts?
- Does your town have an adequate fee structure for permit applications to cover costs of review by an independent consultant?

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See case study: community planning forums.

✓ **Update Open Space plans with a section that discusses land protection as it relates to ACEC resources** in the town. The Parker River/Essex Bay ACEC Resource Inventory (Busse 2000) and the Great Marsh Natural Resource Mapping project are valuable sources of information for these updates and are available from the Coastal Zone

Management North Shore Regional Office.

✓ In towns where no planner is on staff, appoint a **zoning enforcement officer who has separate duties from the building inspector**. With the rapid rate of growth in ACEC communities, building inspectors are often overwhelmed with development review. One way to improve resource protection is to better enforce existing bylaws and regulations by having a separate zoning enforcement officer on staff.

Technical Assistance and Information Sharing

Communities can pursue the following actions to coordinate and improve information sharing and technical assistance efforts:

✓ **Develop a website for each municipality** as a way to distribute information to the public and neighboring communities. For example, news about new bylaws and regulations, town warrants, or Open Space and Master Plans can be placed on the website.

✓ Investigate the possibility of **sharing conservation agent and planner positions** with other towns that do not have professional staff. Not only would this aid in the implementation of existing bylaws and regulations, but also provide assistance with nonregulatory resource protection mechanisms such as grant writing, implementation of mapping and GIS skills, and outreach and education efforts.

✓ Consider requiring **submission of development plans in GIS compatible formats.** As local boards become trained with GIS and data development skills, they can better use this technology to assess proposed development and its impacts on surrounding resource areas. Also, towns may work with regional planning agencies and/or MassGIS to keep their GIS data updated as electronic plans gets submitted.

✓ Take advantage of available media such as newspapers and cable television to attract volunteers. **Volunteer projects** could include: grant writing, serving on open space committees, writing about resource issues in local newspapers, educating landowners about options for land protection, identifying open space protection opportunities by checking records of deeds and titles, participating in environmental education at schools, creating brochures and handouts, and inventorying town-owned conservation properties. *See case study: 1) open space inventories, 2) brochures, and 3) newspaper articles, cable access television and videos.*

← **Pages 29 & 35**

✓ Hold regular c**oordination meetings for municipal staff and board members.** These informal meetings can provide time for boards of health, conservation commissions, and planning board representatives to review projects and permits, identify issues, and discuss opportunities for collaboration.

✓ Consider working with regional partners to purchase and/or develop a **tracking system for permit and license approval conditions.** Septic system approvals, subdivision approvals, conservation commission Orders of Conditions, and other licensing approvals contain stipulations for inspections, monitoring, etc. A tracking system would remind staff when these actions are due, ensure that the action has been successfully completed, and allow staff to enter data for future reference and to share with other

departments. Compiling this information into one system could also help officials and boards consider future land use management strategies and pollution reduction efforts.

✓ Attend **North Shore conservation commission, board of health, and open space committee network meetings** as a way to receive technical assistance and information and network with other communities to address resource issues. In addition, CZM is developing ideas for an ACEC network that will make resources specifically available to the five ACEC communities. Planning boards, open space committees, and boards of health could also attend these regional ACEC network meetings to discuss common issues and funding opportunities for all ACEC communities. *See case study: local network meetings.*

Page 36 →

✓ Identify parcels and landowners within the **ACEC boundary to mail an ACEC brochure and letter** describing the significance of the area, threats to resources and habitats, and the importance of having an ACEC "in your backyard." *See case study: ACEC letter and brochure mailing.*

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STRATEGIES FOR EACH ACEC MUNICIPALITY

A fundamental challenge within ACEC communities is the lack of adequate staff and financial resources needed to initiate more proactive strategies for resource management. Recognizing that all five ACEC communities are unique with different political structures, issues, and approaches, this section highlights strategies to help communities prioritize limited time and funding constraints to best address some of their issues. In addition to the regional *Common Strategies for all ACEC Municipalities* identified in the previous section, officials and boards in each municipality can also consider taking the following steps toward improving resource protection in their community. Contact the CZM North Shore Regional Office (978-281-3972) to get information about organizations and agencies that can provide the technical or funding assistance needed to help implement these strategies. Readers can also refer to the *ACEC Contact List* in Appendix A for additional information.

NEWBURY

As articulated through interviews, the primary resource issues in Newbury include concerns about water quality, wetlands, barrier beach resources and open space and growth management. In addition to actions identified in the previous *Common Strategies for All ACEC Municipalities* section, Newbury officials and boards can also consider the following strategies to address their local resource issues.

Water Quality

The Town of Newbury may want to pursue the following actions to address water quality concerns:

✓ Strengthen protection of land surrounding the Parker River and its tributaries. A Newbury Board of Health Regulation that establishes a 300-foot setback to the river is a good first step toward resource protection. Turning these regulations into a **Parker River Overlay Zoning District** with an associated bylaw that establishes performance standards for development within 300 feet of the Parker River and its tributaries would provide additional land protection and water quality benefits to the town.

The Overlay Zoning District Bylaw would provide consistent enforcement and performance standards and clarify the town's objectives for land use activities within the designated setback. The planning board could be the regulatory authority for the overlay district, which is appropriate since they have a revolving fund for fees as well as consultants and other technical experts needed for independent review of submitted data and plans.

✓ Seek a **full time health agent with technical expertise in wastewater management.** This person could help the town address complexities of the Plum Island water and sewer proposals, Title V, and the use of alternative technologies for wastewater management.

✓ Work with the Metropolitan Valley Planning Commission (MVPC), Parker River Clean Water Association (PRCWA), and the Parker River Basin Team to write a **319 nonpoint source implementation grant** to address some of the targeted water pollution problems identified in the Little River water quality data collected by MVPC and PRCWA.

Wetlands

The Town of Newbury can pursue the following actions to address wetland issues:

✓ **Share a conservation agent** with the Town of West Newbury or **create a full-time environmental planner** that can share responsibilities between the planning board and conservation commission.

✓ **Expand the jurisdiction of the general wetlands bylaw** now being implemented on Plum Island (as required by the Department of Environmental Protection under the September, 2000 Administrative Consent Order to address water quality concerns on the island) to include wetlands in the entire town. Given the importance of wetlands to such things as pollution filtration, habitat, and flood protection, the town could protect these important functions by going beyond Plum Island and including all town wetlands in the Newbury General Wetlands Bylaw. *See case study: 1) no build/no disturb zone, 2) wetland exclusion from lot area calculation, 3) wetland performance standards, and 4) isolated land subject to flooding.*

← Pages 27 & 28

✓ Take advantage of existing advocacy groups such as PRCWA to assist the town in public **outreach campaigns** to gain support for passing bylaws and regulations discussed, such as a Parker River Overlay District and Newbury General Wetlands Bylaw. *See case study: water quality monitoring and presentations.*

← Page 25

Open Space and Growth Management

The Town of Newbury can pursue the following actions to address concerns of open space and growth management:

✓ Consider doing an **inventory to prioritize open space parcels** for acquisition. These efforts will help implement the town's open space plan recently approved by the state and be a step toward developing growth management strategies. *See case study: 1) open space inventory, 2) land protection assistance, and 3) Great Marsh natural resource mapping.*

← Pages 29, 32, 36

✓ Capitalize on the momentum and recent public support of the open space purchase in Byfield to **create a conservation land fund or open space bond** that dedicates a portion of town revenue for land acquisition. *See case study: 1) open space acquisition and 2) conservation restrictions.*

← Pages 30 & 31

Pages 29 & 31 →

✓ **Expand efforts of growth management planning** on Plum Island to the entire town since a significant amount of developable land is highlighted in the buildout analysis recently completed by the state. *See case study: 1) growth management steering committee, and 2) community planning forums.*

✓ Build on the success of the town's recently completed Open Space Plan to **develop a Master Plan.** This can be accomplished by drafting additional plan sections covering future anticipated municipal service and infrastructure needs and growth planning goals, as well as actions the community intends to take to meet their needs and achieve these goals.

Barrier Beach Resources

The Town of Newbury can pursue the following action to address concerns of barrier beach resources:

✓ Develop a **proactive beach management program** focusing on dune restoration, public access, beach nourishment, and storm response. The management program should be developed by a working group that represents diverse interests, such as recreation, business, and conservation.

ROWLEY

As articulated through interviews, the primary resource issues in Rowley include concerns about water supply, wetlands, and open space and growth management. In addition to actions identified in the previous *Common Strategies for All ACEC Municipalities* section, Rowley officials and boards can also consider the following strategies to address their local resource issues.

Water Supply

The Town of Rowley can pursue the following action to address water supply concerns:

Page 21 →

✓ Use the *Town of Ipswich Water Conservation Report* (1998) as a model to address concerns of **water supply.** This report outlines a series of actions that can help the town become more efficient in its water use. *See case study: innovative water conservation techniques.*

Water Quality

The Town of Rowley can pursue the following action to address water quality concerns:

Page 23 →

✓ Consider having the board of health and conservation commission work with the Parker River Basin Team to obtain funding and technical assistance to improve **water quality in agricultural areas** of the upper watershed. *See case study: agricultural best management practices.*

Wetlands

The Town of Rowley can pursue the following action to address concerns about wetlands:

Pages 27 & 28 →

✓ Explore opportunities to modify and adopt the **Rowley General Wetlands Bylaw** postponed at the Spring, 2000 town meeting. By encouraging community participation and actively incorporating citizen comments, the conservation commission will be more successful when bringing a modified version of the bylaw before a future town meeting. *See case study: 1) no build/no disturb zone, 2) wetland exclusion from lot area calculation, 3) wetland performance standards, and 4) isolated land subject to flooding.*

Open Space and Growth Management

The Town of Rowley can pursue the following actions to address concerns about open space growth management:

✓ Consider drafting a **community development plan and/or a master plan** by using a "visioning" workshop as described in the previous *Common Strategies for All ACEC Municipalities* section. With momentum from recent land purchases, commitment from the Finance Committee to dedicate revenue for land acquisition, successful implementation of the Open Space Plan, and funding available from Executive Order 418, opportunities exist for the town to move forward and develop a comprehensive approach to growth management that integrates environmental, community character, and economic goals. *See case study: community planning forum.*

← Page 31

✓ Hire a **full-time or shared planner** with neighboring towns such as Boxford. This person would be able to assist the town in short and long-term planning such as facilitating community planning forums and eventually working to draft a Master Plan or Community Development Plan. The professional planner could also help achieve better coordination between town boards.

IPSWICH

As articulated through interviews, the primary resource issues in Ipswich include concerns about water supply, water quality, and open space and growth management. In addition to actions identified in the previous *Common Strategies for All ACEC Municipalities* section, Ipswich officials and boards can also consider the following strategies to address their local resource issues.

Water Supply

The Town of Ipswich can pursue the following action to address water supply concerns:

✓ Continue efforts to **promote water conservation strategies** as outlined in the report by the Ipswich River Watershed Association (IRWA 1998). *See case study: innovative water conservation techniques.*

← Page 21

Water Quality

The Town of Ipswich can pursue the following actions to address water quality concerns:

✓ Continue studying ways to resolve **water quality issues on Great and Little Necks.** Once the town completes a second study of development impacts from the potential sewer project, it may consider implementing innovative technologies as outlined in the draft Great Neck Septic System Management Plan as an alternative to sewering the area. *See case study: 1) wastewater management overlay district and 2) wastewater management plan.*

← Page 23

✓ Continue raising the **public awareness of pollution and stormwater runoff** by working with the Eight Towns and the Bay Committee to stencil more storm drains in the town. *See case study: storm drain stenciling.*

← Page 24

✓ Continue implementing **stormwater management plan recommendations** as identified by the Coastal Pollution Control Committee. Regional partners can provide technical and financial assistance to help the town achieve these goals and transfer this innovative model to others in the region. *See case study: Coastal Pollution Control Committee.*

← Page 24

Open Space and Growth Management

The Town of Ipswich can pursue the following actions to address open space and growth management concerns:

✓ Work with the Great Marsh Land Protection Team to **document the town's success in creating the open space bond and parcel inventory methods.** Officials and volunteers are leaders in creating successful local land protection strategies. By working with the Land Protection Team, their efforts can be packaged into a transferable model for other towns to learn from. With its approach to land protection, Ipswich has begun to cooperate with partners in the area to apply for regional funding opportunities such as the state's Focus Area Initiative that encourages towns to work together to identify acquisition strategies for a region. *See case study: 1) open space inventory and 2) open space acquisition.*

Pages 29 & 30 →

ESSEX

As articulated through interviews, the primary resource issues in Essex include concerns about water quality, wetlands, and open space and growth management. In addition to actions identified in the previous *Common Strategies for All ACEC Municipalities* section, Essex officials and boards can also consider the following strategies to address their local resource issues.

Water Quality

The Town of Essex can pursue the following action to address water quality concerns:

✓ Incorporate language addressing the requirement for meeting **state stormwater standards** (including the requirement for a stormwater management plan) into Essex Planning Board Subdivision Rules and Regulations. This change is one way to address the issue of stormwater runoff from residential development. Currently, this issue is not addressed in the town's drainage management review of the site plan bylaw. *See case study: stormwater performance bond.*

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✓ Continue **river and stream monitoring** once the town connects to Gloucester's sewer system to ensure that water quality is improved and maintained in ACEC waters of the Essex River and Essex Bay. *See case study: 1) water quality monitoring and presentations, 2) optical brightener handbook and 3) stormdrain stenciling..*

Pages 24 & 25 →

Wetlands

The Town of Essex can pursue the following actions to address wetland concerns:

✓ Incorporate performance standards that address water quality, open space, and habitat, particularly in buffer zones to resource areas into the **water and wetlands resource protection district**. Additional protection of these resource areas beyond this district could also be achieved by adopting an **Essex General Wetland Bylaw.** *See case study: 1) no build/no disturb zone, 2) wetland exclusion from lot area calculation, 3) wetland performance standards, and 4) isolated land subject to flooding.*

Pages 27 & 28 →

✓ Support a **conservation agent and a planner** as full-time staff positions; the town may want to consider sharing the conservation agent with the Town of Hamilton that lies within the same watershed. These positions could help initiate and implement many of the wetlands and planning strategies highlighted for the town.

Open Space and Growth Management

The Town of Essex can pursue the following actions to address open space and growth management concerns:

✓ Hold public **"visioning" forums** to help officials and boards think about future planning needs and determine whether existing zoning districts meet the town's goals and objectives. Ultimately, this process could also help clarify goals and objectives needed to begin a **Community Development Plan**. Executive Order 418 funding and regional partners are poised to offer Essex assistance in future planning. Also, the newly appointed town administrator may be in a position to help the planning board and open space committee to coordinate visioning and Community Development Planning projects. *See case study: community planning forums.*

← Page 31

✓ **Review existing zoning bylaws and districts** in light of concerns related to the new sewer installation. It is important for the community to consider going beyond the use of a sewer overlay district that limits the number of hook-ups to discussing more **comprehensive long-term growth management strategies.** Possible questions to discuss include:

1. Does the overlay district encourage the type, size, and location of growth that the community wants in the future?
2. Does projected growth meet both environmental and economic goals and if not, how can growth be guided in the proper direction? and
3. Do existing bylaws and regulations give local officials control over negative environmental impacts such as reducing the coverage of impervious surface and promoting stormwater best management practices? *See case study: 1) wastewater management overlay district and 2) community planning forums.*

← Pages 23 & 31

✓ Take advantage of the state law that gives planning boards the right to establish a **revolving fund requiring developers to pay a fee** that can be used for consultant review when a plan is submitted.

GLOUCESTER

As articulated through interviews, the primary resource issues in Gloucester include concerns about water quality and open space and growth management. In addition to actions identified in the previous *Common Strategies for All ACEC Municipalities* section, Gloucester officials and boards can also consider the following strategies to address their local resource issues.

Water Quality

The City of Gloucester can pursue the following actions to address water quality concerns:

✓ Incorporate **site plan review** into the zoning ordinance to address resource issues such as stormwater drainage, erosion control, and protection of natural features.

✓ Continue raising the **public awareness of pollution and stormwater runoff** by working with the Eight Towns and the Bay Committee to stencil more storm drains in the city. *See case study: storm drain stenciling.*

← Page 24

✓ As soon as the West Gloucester sewer study is complete, move forward with recommendations for **sewer/septic upgrades** as outlined in the Wastewater Management Plan. This approach is especially important in West Gloucester where water quality is a priority issue for the ACEC. *See case study: 1)*

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wastewater management overlay district and 2) wastewater management plan.

Open Space and Growth Management

The City of Gloucester can pursue the following action to address open space and growth management concerns:

✓ Build on the **Community Plan 2000 success.** Gloucester's implementation of a strong public participation program within their Community Plan 2000 initiative is a regional "visioning" model. Based on existing momentum at the community level, city officials can help ensure the success of this plan by making this initiative a priority in future workplans and continue to dedicate staff and time to the process. Officials can also seek additional help from regional partners to provide assistance as this initiative moves forward. As Ipswich has also organized a community visioning process, the city should consult with the Metropolitan Area Planning Commission to ensure that models, lessons learned, and successful examples can be shared between both Ipswich and Gloucester. *See case study: community planning forums.*

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VI. CONCLUSION

Throughout this assessment, there are many examples of projects and strategies that further natural resource management efforts of the five municipalities, agencies, and organizations working in the Parker River/Essex Bay ACEC. This assessment documents some of these approaches and encourages others to learn from their success. It is important for communities to continue thinking beyond their own political boundaries by working with other municipalities to manage resources on a regional level. This can be accomplished by doing such things as protecting open space parcels connected to adjacent protected areas in neighboring towns and working with other ACEC communities to apply for regional natural resource grants. The ACEC is a designated resource area that can serve as a unifying link to help create this needed regional approach.

photo by Bruce Carlisle

Local and regional groups need to continue adopting regulatory and nonregulatory measures that help guide responsible management decisions. However, fundamental challenges to adopting and implementing new management techniques within local governments include a lack of staff, financial resources, and public support and understanding of the issues. Through interviews, local officials communicated that permit review takes the majority of their time and minimizes their ability to initiate more proactive strategies or improve communication and coordination both within their own local boards and with neighboring communities. These challenges are even more of a concern in towns lacking full-time staff positions. As local officials often do not have the time, staff, or funding needed to address their environmental concerns, the role of regional agencies and organizations and their technical assistance and financial support of new initiatives are key to ensuring effective management of natural resources in the ACEC.

In this assessment, it is also evident that working with the public constituency may afford many benefits and improve the chance that management strategies will be implemented at the local level. Seeing as it is the people for whom the lands are preserved and resources are managed, local governments, state agencies, and conservation organizations should continue fostering a participatory, welcoming, and open relationship with the public they serve. Thus, public education is a fundamental component in the mission of natural resource stewardship. Information disseminated through pamphlets, brochures, letters, newspaper articles, and television are effective ways to educate the public on various topics and provide contacts for further information. Establishing a mechanism for communication with user groups and stakeholders will go far in encouraging their involvement and advocacy for resource protection.

Interviews with local officials and volunteer staff proved to be an invaluable way of obtaining the information needed for this report. Their insight into local and regional approaches, gaps in resource protection, and successful management strategies comprises the majority of the Issues and Case Studies sections. Based on their information and the review of existing bylaws and regulations, CZM North Shore staff were able to offer the strategies highlighted in the final chapter. Ultimately it is up to ACEC municipalities and regional agencies and organizations to decide which actions are the most appropriate based on constraints of staff and funding, realizing that partnerships go a long way in overcoming these constraints. This report provides the ideas, information, and contacts needed to implement additional strategies that have proven successful both at the regional and local level and will ultimately help create a more consistent approach to managing and protecting ACEC resources.

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APPENDIX A: PARKER RIVER/ESSEX BAY ACEC CONTACTS

PARKER RIVER/ESSEX BAY ACEC CONTACT LIST

NOTE: this matrix only highlights the priority focus areas of the listed programs and organizations. For more information, visit the appropriate web sites.

PROGRAM/ORGANIZATION	COMMON ACRONYM	PROGRAMMATIC FOCUS																	PHONE	WEBSITE
		ACEC	water quality	water supply	boat waste	agricultural issues	wetlands/saltmarsh	river protection	barrier beach	wildlife	fisheries	shellfish	aquaculture	growth management	open space protection	public access	technical assistance	permitting		
Conservation Organizations																				
The Bay Circuit Alliance															X	X			978-470-1982	www.serve.com/baycircuit
Ducks Unlimited							X	X		X									800-453-8257	www.ducks.org/community/
Essex County Greenbelt										X	X				X	X	X		978-768-7241	www.ecga.org/
Essex County Sportsmen's Association										X	X								978-462-2694	www.goal.org/clublist.html
Essex County Trails Association						X									X	X				www.thecompass.org/foot/pages/groups.html
Friends of our Trails	FOOT														X	X			978-463-8843	www.thecompass.org/foot/
Friends of the Parker River Wildlife Refuge			X							X		X				X			978-749-9647	www.parkerriver.org/
Ipswich River Watershed Association	IRWA		X	X				X			X					X	X		978-887-8404	www.tiac.net/users/irwa/
Massachusetts Audubon Society	MAS	X	X			X	X	X	X	X	X	X		X	X		X		978-927-1122	www.massaudubon.org/

PROGRAM/ORGANIZATION	COMMON ACRONYM	PROGRAMMATIC FOCUS																	PHONE	WEBSITE
		ACEC	water quality	water supply	boat waste	agricultural issues	wetlands/saltmarsh	river protection	barrier beach	wildlife	fisheries	shellfish	aquaculture	growth management	open space protection	public access	technical assistance	permitting		
Newbury Bay Circuit Committee															X	X			978-462-4605	www1.shore.net/~dwstr/bct/bctnewbury.html
Parker River Clean Water Association	PRCWA		X	X			X	X		X	X				X	X	X		978-462-2551	www.Parker-River.org
The Trustees of Reservations	TTOR						X		X	X					X	X			978-921-1944	www.thetrustees.org/
Interstate Organizations																				
Gulf of Maine Council on the Marine Environment			X				X	X	X	X	X	X								www.gulfofmaine.org/
Educational Institutions																				
Ecosystems Center - Woods Hole Marine Biological Laboratory	MBL		X				X	X		X	X	X							508-289-7688	www.mbl.edu/PIE/
Jackson Estuarine Lab - University of New Hampshire	UNH						X												603-862-2175	bioscience.unh.edu/zoology/jel/jel.html
Federal Agencies																				
EPA Region 1 - Office of Ecosystem Protection	EPA		X				X							X			X	X	888-372-7341	www.epa.gov/region01/
NOAA National Marine Fisheries Service	NMFS		X				X	X		X	X	X	X				X		978-281-9300	www.wh.whoi.edu/ro/doc/nero.html

PROGRAM/ORGANIZATION	COMMON ACRONYM	PROGRAMMATIC FOCUS																	PHONE	WEBSITE
		ACEC	water quality	water supply	boal waste	agricultural issues	wetlands/saltmarsh	river protection	barrier beach	wildlife	fisheries	shellfish	aquaculture	growth management	open space protection	public access	technical assistance	permitting		
Natural Resources Conservation Services	NRCS		X	X		X	X	X									X		978-692-1904	www.nrcs.usda.gov/
Parker River National Wildlife Refuge			X				X		X	X	X	X							978-465-5753	northeast.fws.gov/ma/pkr.htm
State Agencies																				
Department of Environmental Management	DEM	X			X		X								X	X	X		617-626-1000	www.state.ma.us/dem/
Department of Environmental Protection	DEP		X	X			X	X	X							X	X	X	617-292-5500	www.state.ma.us/dep/contact.htm
Department of Food and Agriculture	DFA		X			X									X		X		617-626-1700	www.massdfa.org/
Division of Fisheries and Wildlife	DFW									X	X				X		X		617-626-1591	www.state.ma.us/dfwele/dfw/dfw_toc.htm
Division of Marine Fisheries	DMF		X								X	X	X				X		617-626-1520	www.state.ma.us/dfwele/dmf/dmf_toc.htm
Massachusetts Coastal Zone Management	MCZM	X	X	X	X	X	X		X		X	X	X	X	X	X	X		978-281-3972	www.state.ma.us/czm/
Massachusetts Watershed Initiative	MWI	X	X	X	X	X	X	X		X	X	X		X	X	X	X		978-661-7817	http://www.magnet.state.ma.us/envir/watersheds.htm
Natural Heritage and Endangered Species Program	NHESP									X	X						X		617-727-9194	http://www.heritage.tnc.org/nhp/us/ma

PROGRAM/ORGANIZATION	COMMON ACRONYM	PROGRAMMATIC FOCUS																	PHONE	WEBSITE
		ACEC	water quality	water supply	boat waste	agricultural issues	wetlands/saltmarsh	river protection	barrier beach	wildlife	fisheries	shellfish	aquaculture	growth management	open space protection	public access	technical assistance	permitting		
Northeast Massachusetts Mosquito Control and Wetlands Management							X												978-474-4640	
Riverways Program			X	X			X	X			X						X		617-626-1540	www.state.ma.us/dfwele/River/riv_toc.htm
Wetlands Restoration and Banking Program	WRBP						X										X		617-292-5991	
Regional Groups																				
Eight Towns and the Bay	8TB		X		X	X	X	X	X		X	X	X		X		X		978-374-0519	www.thecompass.org/8TB/
Essex County Conservation District			X	X		X	X	X									X		978-962-8225	www.som.clarkson.edu/agweb/nnycounty/essex.html
Merrimack Valley Planning Commission	MVPC		X	X		X		X	X			X	X	X	X		X		978-374-0519	www.mvpc.org/
Metropolitan Area Planning Commission	MAPC		X											X			X		617-451-2770	www.mapc.org/

Local Officials. Several local authorities address natural resource issues. An appropriate first contact is the local conservation commission office listed below. Depending on the topic of interest, you can also contact boards of health, planning boards, open space committees, harbor masters, and shellfish constables. Contact information for these officials can be obtained by calling the town/city clerk listed below.

Town	Gloucester	Essex	Ipswich	Rowley	Newbury
Conservation Commission	978-281-9781	978-768-7111	978-356-6661	978-948-2330	978-462-2332
Town Clerk	978-281-9720	978-768-7111	978-356-6600	978-948-2081	978-462-2332

APPENDIX B: TABLE OF LOCAL REGULATORY STRATEGIES

TABLE OF LOCAL REGULATORY STRATEGIES

Newbury Zoning Bylaw

(Adopted 1959 and Revised until July 26, 1999)

Dimensional and Density Regulations

	Agricultural-Residential	Industrial	Business	Commercial Highway
Lot area minimum:	Single family: 40,000 sq.ft.; Two Family: 80,000 sq.ft.	40,000 sq.ft.	10,000 sq.ft.	40,000 sq.ft.
Lot frontage:	125 ft	200 ft	100 ft	200 ft
setbacks:	10 ft from property line 20 ft from street	25 ft from side and rear 50 ft to highway/watercourse	20 ft front 10 ft side	50 ft to highway 25 ft from side and rear
Lot coverage:	none	50% max	50% or 2500 sq.ft. max	50% max
	Not more than 20% of minimum lot area in wetlands Reduced frontage lots: must have 50 ft frontage, 4.5 acres of which 1.5 acres not in floodplain or wetland		Residences shall meet requirements of nearest residential district	Permitted uses by right and some by special permit by Board of Appeals

Permit Granting Authority is Zoning Board of Appeals
Special Permit Granting Authority is Board of Selectmen or the Board of Appeals

Special Regulations

Flood Area Regulations

- Regulations for Zones VI-30 (coastal high hazard area) on Flood Insurance Rate Maps (FIRM)
- Construction landward of mean high tide
- On pilings and lowest floor above base flood level with breakaway walls
- Fill or alterations for structural support prohibited
- For A1-30 Zones, utility and sanitary facilities and walls resistant to water; engineer statement certifying flood proofing methods
- No new construction until regulatory floodway designated, unless won't increase water surface elevation
- Mobile homes elevated and anchored
- Variances (By Zoning Board of Appeals) for those surrounded by others not at minimum base flood elevations and is minimum necessary and won't threaten safety
- All necessary permits including 404 Federal Water Pollution Control Act (FWPCA)
- In floodway, no construction unless proven that won't increase flood levels

Water Supply Protection District

- Overlay District which applies to new construction, reconstruction, expansion
- Within watersheds of groundwater aquifers which may provide water as mapped "Water Resources, Town of Newbury, May 21, 1997"
- Resolution of boundary dispute through Special Permit application to *Zoning Board of Appeals*
- Prohibited Uses – hazardous materials and earth removal to 6 ft of water table
- Special Permitted Uses - By *Board of Selectmen*: water control devices etc; alteration that do not adversely affect water quality or quantity; impervious more than 15% or 2500 sq.ft. and that has system for groundwater recharge
- Special Permit for certain uses by Board of Selectmen granted if Board of Health, Conservation Commission, Board of Water Commissioners, Planning Board receive copy and provide written recommendations or no comment; must meet standards – no adverse affect on existing or potential quality or quantity of water and avoid disturbance of soils, topography, drainage, vegetation, etc.
- Site Plan to provide a list of potentially hazardous materials, and a Hazardous Materials Management Plan with Board of Health and Fire Chief; down-gradient water monitoring wells location
- Violations – remedy, preventive measures for future, schedule of compliance

Open Space Residential Design Bylaw

- Encourages developers to work with the planning board to create subdivisions that maximize the amount and quality of open space preserved while constructing subdivisions in a more economical way that creates opportunities for mixed housing.

Newbury Subdivision Rules and Regulations

(Adopted by the Planning Board January 9, 1961 as amended March 18, 1998)

Approval Under Subdivision Control Law Not Required	• Plans submitted with all locations, boundaries, references, lot dimensions, frontage, zoning, geographic features that restrict access, designation of wetlands • Board considers: alignment of roadway provide safe visibility; roadway of sufficient width and of reasonable horizontal alignment; roadway must have suitable grades and adequate construction to provide for needs of traffic in relation to proposed use of land • Either endorse or notify applicant that approval IS required
Preliminary Subdivision Plan	• Submission of Preliminary Plan to Board and Board of Health is required for non-residential subdivision and strongly recommended but up to applicant discretion for residential subdivision • Submission of plans with information, including wetlands and waterbody locations, topography, drainage systems • Zoning information, including overlays • Preliminary draft of Environmental Analysis*, including soils map (qualitative analysis at this time) • Plans forwarded to: Conservation Commission, the Highway Department, the Board of Fire Engineers, the Water District Commission • Approve; approve with modifications; or disapprove – but not recorded until definitive plan approval ***Environmental Analysis**: prepared by interdisciplinary team including planner, landscape architect, biologist, soils scientist (may be waived for 5 lots or less)* *Plans showing: data on Definitive Plan, topography, high water marks, existing structures, vegetative cover, soils types (Soil Conservation Service Soil Study, groundwater level, percolation tests, visual analysis vistas, waterbodies, wetlands, aquifers, narrative statement on water quality-surface and ground, effects on wildlife habitats, botantical features, scenic or historic sites, capability of soils, vegetation, proposed erosion control measures to support development (THIS CANNOT BE WAIVED), proposed traffic flow, effect on public services*
Definitive Subdivision Plan	• Application to Board of Health and Planning Board • Statement of adequate water supply, drainage calculations, soils reports and percolation tests • Lot layout plan - including existing boundaries, features and zoning; setbacks and potential house site with soil examinations and test pits if required by Board; topography –base flood elevation, trees, wetlands (determination of applicablility from Conservation Commission), earth removal, street plan profile and section etc. • Environmental Analysis • Drainage, route and receiving waters; use 25 year storm frequency for cross culverts • Storm Water Management Plan* containing maps, charts, graphs, tables, photos, narratives, calculations etc showing existing environmental conditions (surface runoff of 2, 10, 100 year storm events, description of watercourses and wetlands on or entering site- quality and classification, groundwater levels, flood plains, veg types, topography, soils); proposed alterations; development layout; predicted impacts; components of drainage system and measures for detention, retention, infiltration, protection of quality (N or Ph Loading Report); ensurance of performance standards; Design Standards to be met (direct discharge prohibited, methods for detention, retention, infiltration, release, swales, treatments, open space, monitoring wells required for various parameters; general requirements (maintenance, bonds, Operation and Maintenance Plan) • Water supply mains and appurtenances, sewer mains, sewage disposal, storm drains, easements for drainage • Public Hearing – Board of Health shall have provided written report for approval or disapproval; others shall have responded • Approve; approve with modifications; or disapprove (if Wetland Protection Act applicable – contingent on Conservation Commission approval) • Performance guarantee – bonds, covenants, agreements with lenders; Rescissions allowed • Maintenance of streets until conveyed to Town • As-built Plans ***Storm Water Management**: must be followed for subdivisions, multi-family dvlpts, facilities or activities of 20,000 sq.ft. or more of impermeable surface or 15% of area rendered impervious, all roadway construction and upgrading, any activity within wetlands and a 300 ft buffer zone, Flood Plain and Watershed Protection District, and Town Water Supply District and involving maintenance, alteration, use or improvement to an existing strom water mgmt structure*
Requirements for Improvements and Design	• Design of subdivision should reduce: volume of cut and fill, disturbance to vegetation, tree removal, waterway alteration, paved areas • Street alignment and location designed for safety, general layout and dimension – may authorize reduced width for increased length • May require plan to show parks for recreation or open space made available for purchase by Town • Flood Plain – minimize flood damage, drainage • Wetlands Protection Act • Common driveways for up to 5 dwelling units if serve public interest – hearing is required • Construction: inspections, methods and materials, street design standards • Standards, specifications, and criteria for storm drainage, water facilities, sewer, utilities • Inspection of required improvements; as-built plans; tree removal needs approval, tree planting

Rowley Protective Zoning Bylaw

(Adopted at the Annual Town Meeting and Approved by the Attorney General in 1960 and Amended thru November 1999)

Dimensional and Density Regulations

	Residential and Outlying	Central District	Commercial
Single Family:			
lot area minimum (sq.ft.):	60,000	30,000	
lot frontage (ft):	150	125	
lot width (ft):	100	100	100
setbacks:	50 ft to street, 15 ft to other	50 ft to street, 15 ft to other	50 ft to street, 15 ft to other
lot coverage max:	25%	25%	50%
Multi-Family:			
lot area minimum (sq.ft.):	20 acres	2 acres	
lot frontage (ft):	200 for 1st and 100 for each addition	150 for 1st and 75 for additional	
lot coverage maximum:	25%	25%	
setbacks:	no nearer than 75 ft from centerline; or nearer than 50 ft from property line;	25 ft from property line	
	Not more than 16 structures	Not more than 4 structures	

- Water and swamp, frequent flooding (as mapped) shall not be considered in minimum lot area
- No building erected on "severe" soils
- Floor area requirements; dwelling unit requirements; average finish grade; parking; structural style
- Open space and landscaping requirements: landscaping buffers; access and utility requirements
- Site Plan and Subdivision Approval required
- Written approval of Board of Health and Definitive Plan submitted, even if not subdivision, floor plan
- Environmental Impact Statement with Definitive Plan (except for up to 4 lots in Central District)

Intensity of Use

- Open Space Residential Development (Cluster Development*) (Amended and Approved by AG 9/99)*
- For plan in residential and outlying districts, applicant may submit to Planning Board for Special Permit (minimum 5 acres tract) (Review by Conservation Commission and Board of Health for recommendations)
- Submit Site Plan showing proposal, size, buildable and open space areas, wetland locations
- Planning Board considers: efficiency, harmony with natural features and historic components, appropriately sized open spaces, protection of natural features, preservation of scenic vistas, public safety
- Guidelines for design: buffering/landscaping, attractive views preserved, avoids large mass and compatible materials, varied rooflines
- May request Conceptual Subdivision Lot Layout Plan
- Dwelling units allowed: formula, but should not exceed maximum under normal yield; deletes areas of wetlands and waterbodies from calculation.
- Density bonus of up to 20% if either: substantial buffer around perimeter which is deeded or conservation restriction to town; or public improvement or amenities providing benefit to Town (i.e., decrease in storm water runoff than conventional plan and provisions for off-site facilities improvements to mitigate proposed development); or attached townhouse dwellings with maximum of 2 bedrooms per unit, with New England village style architecture
- Planning Board may waive minimum requirements for frontage, lot area, width, yard area, lot coverage in order to achieve maximum open space area
- Clusters of no more than 8 single family dwellings, 2 two family dwellings, and 4 multi family dwellings
- Minimum width of open space: 50 ft
- Minimum 50% open space per parcel (not exceed 10% grade, must be at least 1000 sq.ft. and 25 ft wide)
- Septic may be placed in open space/common area
- No increase in peak runoff and erosion mitigation measures
- Residents Association required

Use Regulations	**Water Supply Protection Districts**	• Uses and activities requiring Special Permit by the Zoning Board of Appeals via hearing if don't conform to uses in district, pesticides, fertilizers, water control devices, any use that will render impervious more than 15% or 2,500 sq.ft. • Site plan required
	Flood Plain District *Establishment of Flood Plain and Watershed Protection Districts described rather than mapped*	• Prohibited uses: dumping, excavating, etc. • No buildings except piers or wharves unless a permit is granted • Permit by Board of Selectmen, submit application with plans • Conservation Commission and Board of Health input- look at safety, 15 ft above mean sea level criteria for 1st floors, sewerage, access, drainage, max 25% of lot area in floodplain
Site Plan Review	• For uses and change of use for which approval by Planning Board, Board of Selectmen, or Board of Appeals is required • Contents: Boundaries, abutters, existing and proposed buildings, impervious coverage, provisions for screening, surfacing, lighting, landscaping, water disposal, drainage, dust and erosion control, natural features, parking, topography, flood plain elevation etc. • Criteria: Protection of adjoining and neighborhood, traffic, safety and access, parking, emergency access, storm water drainage, water and sewage adequacy, screening, protection of natural features • Copies are distributed to Planning Board, Board of Health, Conservation Commission, and Building Inspector • Public hearing with Planning Board or Board of Selectmen and public notification	
General Requirements	• Soil Suitability: No development on land soils listed as having frequent flooding or depth to water table of less than 6 ft without a special permit from Board of Selectmen and Conservation Commission when required Board of Selectmen will sign off on all building permits • Hazardous Materials: notice for use filed with Board of Selectmen; radio-active requires Special Permit	

Rowley Planning Board Rules and Regulations Governing the Subdivision of Land

(Adopted by the Planning Board in 1987)

Plan Believed Not to Require Approval	• Plans submitted with all locations, boundaries, references, etc. • Includes soil types, slopes, wetlands • Either endorse or notify applicant that approval IS required
Preliminary Subdivision Plan	• Submission of Preliminary Plan is required for non-residential subdivision and strongly recommended but up to applicant discretion for residential subdivision • Submission of plans with information, including wetlands and waterbody locations, slopes, drainage systems, soil types • Project Information Summary Sheet (to determine what elements of the Environmental Impact Statement need to be included) • Plans forwarded to: Public Works, Public Safety, Fire, Public Utilities, Town Engineer, Conservation Commission, etc • Approve; approve with modifications; or disapprove – but not recorded until definitive plan approval (good for 7 months) • Amendment in 1983 to include Rules and Regulations Governing Storm Water Management: at preliminary stages submit plan containing maps, charts, graphs, tables, photos, narratives and calculations showing existing environmental conditions (surface runoff of 2, 10, 100 year storm events, description of watercourses and wetlands on or entering site- quality and classification, groundwater levels, flood plains, vegetative types, topography, soils); proposed alterations; development layout (site arrangement, drainage systems, method of calculations); predicted impacts (changes in water quality, groundwater, flooding, adverse impacts on wetlands and vegetation); components of drainage system and measures for detention, retention, infiltration, protection of quality (N or Ph Loading Report); ensurance of performance standards (natural hydrodynamics, protect or improve characteristics above); design standards to be met (direct discharge prohibited, methods for detention, retention, infiltration, release, swales, treatments, open space, monitoring wells required for various parameters); general requirements (maintenance, bonds, Operation and Maintenance Plan)

Definitive Subdivision Plan	• Written notice to Town Clerk • Lot layout and zoning • Major features of land – waterways, trails, buildings drainage courses, etc. • Contour plan, utilities plan, and drainage plan • Street plan and profile • Environmental Impact Statement – *physical element* (air and noise, water quality/quantity, soils, ecology), *transportation element* (traffic, mass transit, maintenance), *public utility element* (water supply and distribution, sewage treatment, storm solid waste), *neighborhood and community element* (schools, police, fire, recreation), *socio-economic element* (population, low income house, employment), *aesthetic element* (architecture, lighting, landscaping), *master plans element***,** and *cost-benefit element* • Erosion/Sedimentation Control Plan • Board may require soil surveys • Public hearing - Board of Health shall have provided written report for approval or disapproval; other town officials shall have responded • Approve; approve with modifications; or disapprove • Performance guarantee – bonds, covenants, agreements with lenders • Rescissions allowed • Maintenance of streets until conveyed to Town *Amendment 1989 General Guidelines for site plan review criteria – give basic policies to consider – consistency, compatibility, integration, architectural harmony, safe, prevent pollution etc.*
Requirements for Improvements and Design	• Design of subdivision must take into account: open space (for parks & recreation); protection of natural features, lot arrangement and dimensions, drainage, utilities • Construction: inspections, methods and materials, street design standards; Erosion/Sedimentation Control Program • Standards, specifications, and criteria for drainage of surface and sub-surface water, water facilities, sewer, utilities • Tree planting required

Ipswich Protective Zoning Bylaw

(Adopted at the Annual Town Meeting and Approved by the Attorney General in 1977 and Amended thru April 1999)

Dimensional and Density Regulations

	Rural (RRA)	Intown	Business	Planned Commercial	Industrial
Lot area minimum (sq.ft.):	43,560	10,000	5,000	87,120	43,560
Lot width minimum (ft):	175	90	50	170	150
Lot frontage minimum (ft):	150	50	50	70	70
Min. setbacks (ft) (front):	50	20	0	50	50
(side):	40	10	10	25	25
(rear):	30	20	20	50	50
Maximum building area %:	20	40	80	40	30
Minimum open space %:	50	30	5	30	30
Accessory structures:	≤25% of the min lot area				

Special Regulations

Open Space Preservation (Cluster) Zoning

- Subject to approval of Planning Board under Rules and Regulations Governing the Subdivision of Land
- Application required for ≥6 dwellings on minimum of 5 acres; may submit with conventional subdivision plan if applicable; recommended for ≤5 lots
- Special permitted uses
- Site Plan and soil tests required
- Wetland/Coastal Exclusion: ≤½ area in lot calculation
- Septic may be placed in open space
- ≥30% open space conservation restriction required
- Dimensional Regulations: no minimum lot area, frontage, setbacks except minimums within each lot; <30% coverage (including driveways)
- Concept Plan required for subdivision in addition to Special Permit
- Board seeks recommendations of the Open Space Committee
- Lots cannot be further subdivided after permit granted
- Common driveways allowed for ≤5 lots
- Amended in 2001 to include principles of Open Space Residential Design.

Great Estate Preservation Development

- By Special Permit from Planning Board
- Min lot size of 60 acres and buildings constructed prior to Dec 31, 1996 which have a minimum of 40,000 sq.ft. floor area
- New floor area maximum: total does not exceed 3000 x the number of possible dwelling units which could be developed under one-acre zoning requirements); additional if rehabilitation existing buildings: 5 sq.ft. for every 1 sq.ft. rehabilitated or renovated; total allowable floor area not to exceed 8% of lot.
- Special permitted uses; residential dwellings not to exceed 25% of max floor area which may be developed; multiple family must include 10% affordable housing, at least 50% over the age of 55
- Site plan with soil tests and the # of buildable lots as if subdivided
- Wetland/Coastal Exclusion: ≤½ area in lot calculation
- ≥30% open space conservation restriction required
- Minimum setback of 100 ft and 100 ft buffer strip of vegetation
- ≤20% of lot for commercial use, buildings and parking etc.
- Special permit accompanied by site development report with inventories of natural, historic resources, and protection and preservation strategies
- Preliminary concept plan for Planning Board and Development Review Committee, which shall be referred to all other boards and committees

Water Supply Protection Districts

- Restricted uses or by Special Permit from Planning Board if demonstrated by Professional Engineer that no degradation
- Impose design and performance standards and monitoring for special permits, monitoring fees

Flood Plain District

- Overlay district as established by Flood Plain Districts mapped by FEMA/FIRM
- Must comply with MA General Laws Ch 131, Sec 40 and with MA building code for floodplain and coastal high hazard areas; wetlands protection regulations; inland wetlands restriction; coastal wetland restriction; requirements for subsurface disposal of sanitary sewage
- Either by right or by special permit depending on circumstances
- Reviewed by Building Inspector to meet State Building Code
- More restrictive development requirements according to flood zone

Site Plan Review	• Planning Board Review for certain construction to ensure sound site utilization principles • Site Plans for building permits for >2500 sq.ft. or improvements of 30% existing floor area; change of use • Plans must address: traffic, safety and access, parking, emergency access, storm water drainage, water and sewage adequacy, screening, protection of natural features and vistas, signage • Copies are distributed • Public Hearing with Planning Board and public notification • Technical consultant services at cost of applicant

Ipswich Planning Board Rules and Regulations Governing the Subdivision of Land *(Adopted by the Planning Board in 1993)*	
Approval Under Subdivision Control Law Not Required	• Plans submitted with all locations, boundaries, references, lot dimensions, frontage, waterbodies etc. • Board considers: Alignment of traveled way provide safe visibility; Right of Way at least 40 ft wide and of reasonable horizontal alignment; traveled way of at least 18 ft wide, 8" depth gravel, drainage; if >6 lots, surfaced road; public utilities without cost to town • Either endorse or notify applicant that approval is required
Preliminary Subdivision Plan	• Submission of Preliminary Plan is required for non-residential subdivision and strongly recommended but up to applicant discretion for residential subdivision • Submission of plans with information, including wetlands and waterbody locations, topography, drainage systems • Plans forwarded to: Public Works, Public Safety, Fire, Public Utilities, Town Engineer, Conservation Commission, etc. • Approve; approve with modifications; or disapprove – but not recorded until definitive plan approval
Definitive Subdivision Plan	• Written notice to Board of Health and Planning Board • Lot layout plan - including existing features and zoning • Grading, drainage, and utilities plan – including information about wetland boundaries in and within 100' of subdivision and delineated in field; 100 year flood boundary; erosion/sediment control; cut and fill • Street plan and profile for utilities • Storm water management report • Environmental and Community Impact Analysis; if ≥6 lots or non-residential; beneficial and adverse impacts from construction phase and completion; alternatives; corrective and protective mitigation measures; impacts on *natural environment* (air and noise, water quality/quantity, land, plants, wildlife, sewage), *man-made environment* (neighborhood, zoning), *public services* (schools, police, fire, recreation, solid waste, traffic), *aesthetics*, cost-benefit analysis • Public hearing – Board of Health shall have provided written report for approval or disapproval; others shall have responded • Approve; approve with modifications; or disapprove • Performance guarantee – bonds, covenants, agreements with lenders • Rescissions allowed • Maintenance of streets until conveyed to Town
Requirements for Improvements and Design	• Design of subdivision must take into account: natural features, unsuitable land, lot arrangement and dimensions, soils, drainage, debris and waste • Construction: inspections, methods and materials, street design standards • Standards, specifications, and criteria for storm drainage, water facilities, sewer, utilities • Tree planting required • Storm water management system – must meet design standards, be constructed and must be maintained before accepted by Town security bond may be required

Ipswich Wetlands Protection Bylaw and Rules and Regulations		
Ipswich Wetlands Protection Bylaw (Adopted at the Annual Town Meeting and Approved by Attorney General in 1990)	**Jurisdiction**	• Coastal and freshwater wetlands, areas bordering on water body, or land within 100 feet of these areas, land under a water body or subject to flooding tidal action or coastal storm flow, vernal pools, or land within 150 ft of Parker River/Essex Bay ACEC; activity must alter these resources to be subject to regulation • Entry upon private property for enforcement and examinations allowed
	Procedure	• Costs and expenses by applicant for engineering and consultant services to review Notice of Intent or Request for Determination of Applicability when: alter >500 feet of wetland or buffer zone or land under water body, 50 linear feet of bank alteration to waterway, ocean discharge of pollutants, or construction of detention or retention basin or water control structure • Public Notification in paper; hearing within 21 days of submission • Burden of proof on applicant to prove no adverse affects to interests
	Permit and Conditions, Security, Enforcement	• Commission may impose conditions and all work shall conform • Record with Essex County Registry of Deeds • Performance or conditions may be imposed by bond or conservation restriction, easement or other covenant • Enforce bylaw thru violation notices, enforcement orders, and civil or criminal court actions – Board of Selectmen or Chief of Police may take legal action for enforcement respectively • Subject to indictment or complaint brought in District Court or non-criminal disposition (penalties)
Rules and Regulations (Adopted by Ipswich Conservation Commission in 1992 and Amended in 1997 pursuant to Wetlands Protection By-Law Section 14)	**Activities**	• Additional to By-Law: crossing of wetland and buffer zones with machinery for percolation testing, soil exploration, clearing of trees or vegetation for landscaping, well drilling, accessory structures, harvesting of salt marsh hay
	Submission Standards: Determination of Applicability (DOA) and Notice of Intent (NOI)	• DOA must include maps, drawing with boundaries of wetlands, field survey, delineations etc. – prior to Notice of Intent (NOI) • NOI same as for MA General Laws Ch 131 S 40 and 310 CMR 10.00 – so no separate submission required • Site plans to be submitted showing all resources and buffer zones, setbacks, activities, contours, drainage structures and lowest elevations, location of water retention areas and 100 year flood level, ground water elevations, soil characteristics, easements, runoff plan for pre and post development, storm water control designs, erosion and sediment control, profile drawings, ACEC boundary etc. Wildlife habitat evaluations may be required • Wetland Resource Alteration and Replication narrative and detail plan shall be submitted • Preparations for site visit-demarcating boundaries and structures
	Standards for Review	• Avoid wetland alteration or filling • Filling be minimized to greatest possible extent feasible • Mitigation if alteration or filling – 1.5 to 1 – No net loss • ACEC: Regulations within 150 ft ; must show potential impacts mitigated • Vegetated Wetlands: Non-bordering vegetated wetlands must be over 5000 sq.ft.; performance standards; applies to "limited projects" • Buffer Zone: 100 ft landward of wetland; (50 ft no disturbance; plus 15 ft no build zone) • Regulate application of pesticides, fertilizers etc. • No subsurface sewage, etc unless proven no impact • Projects subject to Ch 91 also require Commission approval – MEPA process 1st
	Orders of Conditions, Certificates of Compliance	• Permits or Orders of Conditions issued and recorded prior to activities • Consultant to monitor progress of work in accordance with plans at expense to applicant, report to Commission • May request Certificate of Compliance upon completion

Essex Zoning Bylaws

Dimensional and Density Regulations

Land Use:	Residential	Business	Motel and Hotel	Industrial
Lot area minimum:	40,000 sq.ft.; 30,000 sq.ft. for land on street in existence on June 7, 1972	40,000 sq.ft.; 30,000 sq.ft.	90,000 sq.ft.	90,000 sq.ft.
Lot frontage minimum:	150 ft	150 ft	200 ft	300 ft
Lot width minimum:	150 ft	n/a	n/a	n/a
Lot depth:	100 ft	100 ft	n/a	n/a
Setbacks: (front):	25 ft	25 ft (50 if over 10,000sq.ft.)	100 ft	100 ft
(side):	20 ft	20 ft (20 if over 10,000sq.ft.)	50 ft	100 ft
(rear):	30 ft	50 ft	100 ft	100 ft
Lot coverage maximum:	25 %	25%	none	33%
	For 2 family: septic system approval requires submittal of drawings			

*** Note: 100% wetland area excluded from lot area calculations*

Permits and Administration

Special Permits:

- Planning Board Approval
- Airport, recreational facilities, private schools, public utility, radio, telecommunications, trucking terminals, private hospitals, nursing homes, scientific research accessory uses, multiple family dwellings and apartments. Lot area = min 60,000 sq.ft. for 3 dwelling units and 90,000 sq.ft. for 4 or more units; lot frontage = 300 ft.; setbacks = 100 ft; minimum distance between buildings = 20 ft; 50% lot coverage.(multiple family requires septic system)
- Building Permits: all building permits site plans must be approved by Planning Board, except in the case of a variance which goes to Board of Appeals. Permit from building inspector. Site plan must include shape, size, height and location of lot and relation to abutting streets and shape, size, height and locations for buildings to be erected and those existing
- Board of Appeals: decide appeals of planning board, building inspector, or other; authorize variances; may prescribe conditions and posting bonds
- Requires a hearing, publication

Special Districts

Wetland District

- Planning Board acts as Special Permit Granting Authority
- Defined by mapped boundaries and land within the bank or boundary of stream, river, or wetland
- Overlay district to protect from flooding, preserve water table, conserve natural conditions for education, recreation, and general welfare
- Permitted uses by right: conservation, outdoor recreation, forestry, agriculture, gardening, maintenance and repair, accessory structures or uses for above, dams, dredge and fill for above, existing uses
- Restrictions: land fill or dumping, buildings, dredging, permanent storage – shall NOT be permitted
- Special Permits for exceptions: determine not generally wet
- Appeals on variances shall go to Conservation Commission for referral and recommendations
- Violations subject to fines up to $20.00 for each day such violation exists

Flood Plain District

- Establishment of Flood Plain Districts mapped as an overlay. Essex Flood Insurance Rate Map (1986)
- Must comply with MA Building Code for floodplain and coastal high hazard areas;
- Applicant must obtain base flood elevation data to be reviewed by building inspector
- More restrictive development requirements according to flood zone

Water Resource Protection Districts

- Mapped area: comprises drainage basin of Chebacco Lake or Cedar Swamp
- Prohibited uses, i.e. disposal, storage of petroleum products, mining, hazardous materials, auto service, dry cleaning, residential which has >15% impervious cover or lot area less than 40,000 sq.ft./dwelling unit, earth removal, fertilizer storage, etc.
- Permitted uses by Special Permit so long as no adverse impact upon ground or surface water:
  Certain sewage disposal systems, application of pesticides or fertilizers for non-domestic, non-agriculture use;
  More than 15% of lot area or 2500 sq.ft. to be approved only if using a system for artificial recharge of storm water;
  If any lot has one third or more of area in WRPD, then must meet these requirements

Essex Rules and Regulations Relative to Subdivision Control *(Adopted by the Planning Board in 1981)*	
Plans Believed Not to Require Approval	• Plans submitted with all locations, boundaries, references, lot dimensions, frontage • Board considers adequate access as defined: either approval will result in the creation of 2 or 3 lots from a parcel as existing on July 1, 1985 and served by a town maintained way, access is in compliance with standards for width, gravel foundation, surface type, grade etc, or Planning Board determines after consultation with Fire, Police, Board of Selectmen that the way is sufficient • Either endorse or notify applicant that approval IS required
Preliminary Subdivision Plan	• Submission of Preliminary Plan to Board of Health and Planning Board is strongly recommended but up to applicant discretion • Submission of plans with information, including wetlands and waterbody locations, topography, drainage systems, zoning classification • Approve; approve with modifications; or disapprove – but not recorded until definitive plan approval
Definitive Subdivision Plan	• Definitive plans submitted to: Planning Board as well as Board of Health, Board of Selectmen, Dept of Public Works, Conservation Commission, Chief of Police, and Fire Chief (all must comment) • Lot/locus plan showing roads and profiles, construction plan drainage, may require engineering or environmental analyses and soil surveys at owners expense • Plan contents: locations, lots, etc. plus drainage and cross sections, water supply mains and appurtenances, course of discharge to adjacent landowners, location of base flood elevation, street plan, and profile- utilities • Construction plan and contents – trees, wetlands, water supplies and onsite disposal • Public hearing – Board of Health shall have provided written report for approval or disapproval; Conservation Commission determines applicability of Wetland Act/Notice of Intent • Planning Board will approve; approve with modifications; or disapprove based on criteria: Safety, hazards, welfare, environmental degradation, design and construction standards, zoning • Performance guarantee – bonds, covenants, agreements with lenders • No construction until: streets meet standards, facilities for water, recordation of plan, security for improvements; rescission is possible • Maintenance of streets until conveyed to Town • As built plans before release of performance guarantee
Requirements for Improvements and Design	• Design of subdivision must take into account: cut and fill, vegetative disturbance, tree removal, waterway alteration, impervious surface, natural features, maintenance of runoff • Easements for storm water and drainage or access if necessary • Open Space: Planning Board may require for parks; at least 1 acre/20 sq.ft.; may require no build for 3 years; may require street trees or green spaces • Natural Features: preserved as much as possible; disturbance prohibited • Lot drainage not to cause detrimental drainage onto another lot • Land not suitable for housing must not be used for residential purposes – only for open space, playgrounds, etc. • Must submit Sediment Control Plan with methods: berms, dikes, ponds • Streets and Ways criteria, street drainage, curbing, circulation • Drainage methods, storm sewers, basins and culverts based on frequency of storm; design based on soil cover complex method; specifications • Flood Hazard Avoidance: clustering, open space, drainage systems located and designed to minimize flood damage

Gloucester 1999 Zoning Ordinance

(With Amendments to Date Incorporated – Issued July 1999)

Dimensional and Density Regulations

Density examples
high density:5,000 sq.ft.
medium density: 10,000 sq.ft.
low density: 20,000 sq.ft.
rural/coastal: 40,000 sq.ft.
rural: 80,000 sq.ft.

Density:	High	Med	Low	Rural/Coastal	Rural	Business	Industrial
Lot width minimum (ft):	50	80	100	150	150	80	80
Lot frontage minimum(ft):	50	65	80	100	100	65	65
Minimum setbacks (ft):							
(front):	15	20	30	40	40	30	15
(side):	7.5	10	20	30	30	0*	15
(rear):	20	20	30	30	30	15	15
Lot coverage maximum:	35%	30%	25%	25%	25%	50%	50%

Other requirements for height, accessory structures, and dimensional requirements for shopping centers
Business Park District (not listed above) requires min 10% of lot as open space

See ordinance for requirements for multiple family, hotels, shopping centers, motor vehicle services, pork chop lots, common driveways

Special Regulations

Earth Fill and Removal

- Special Permit by City Council
- Soil & Water Conservation Guidelines conformance
- Exempt: construction grading, <50 cubic yards, in accordance with an Order of Conditions instead, landscaping or gardening
- Must submit plan and soils engineer report, bond
- Provisions for drainage, prevention of wind/water erosion onto adjoining properties
- Additional conditions

Cluster Development

- Special Permit by Planning Board
- For parcels equivalent to 5x the minimum lot size in that district (no less than 3 acres) within residential districts
- Preliminary plan encouraged showing proposal and open space
- Board of Health, Conservation Commission, Fire and Building for review
- Definitive Plan shall include: requirements and materials for Rules and Regulations Governing Subdivision for Definitive Plan; open space and maintenance of open space; phases of construction
- Board of Health reports approval or disapproval
- Public hearing after all others officials get copy
- Consider: lots, streets, parking, layout and design, open space for recreation, access, scenic vistas, preservation of natural and historic features, public safety, and maintenance
- Development density: parcel/90% of minimum lot requirement, no more than 10 single family dwellings, 4 multi-family dwellings in cluster
- Density Bonus (increase in lots or dwelling units up to 20% above the allowed) if: 1) deed a portion of applicable land area to city; or 2) designate to affordable housing (applicant receive 1 lot or dwelling units for each 1.5 affordable dwelling units built)
- Dimensions: minimum size 10,000 sq.ft. for single family dwelling or two family dwellings; 20,000 sq.ft. for multi-family dwellings; waive 50% yard and frontage for both
- Open space ≥30% applicable land area (buildable land) – conveyed to a trust or corporation as a conservation restriction (CR), or to non-profit as CR, or to City for park or open space management by Conservation Commission
- Minimum width between open space and clusters of development or clusters of development and adjacent property is 50 feet
- Open space to be used for designated purposes

Special Regulations (continuted)	**Watershed Protection Overlay District**	• Special Permit uses by Planning Board • Definition and Mapped "Public Water Supply Watershed Boundary Maps" • Burden of proof on applicant to prove otherwise • For Special Permit, must submit plan with provisions to control erosion and sedimentation, seepage from sewer, impervious surfaces • Referred to Board of Health, Conservation Commission, City Engineer for recommendations • Public hearing • May issue special permit if appropriate for topography, soils, etc., no adverse effect during construction of water quality or quantity, avoids disturbance of soils, topography, drainage, vegetation, and water-related character • Fertilizers, pesticides, herbicides requires report from Board of health stating prevention of hazardous concentrations in water and land: erosion control techniques, runoff water, displacement etc.
	Lowland Requirements	• Special Permit by City Council for exception to build at less than 10' elevation that poses no hazard • Considered hazardous: floor level <12 ft; sewage disposal inundation; cut and fill displacement; water supply contamination • No removal, fill, construction on land bordering coastal or inland waters without Special Permit and determination that Hatch and Jones Act satisfied, no health safety hazard, conserve shellfish and wildlife resources
	Major Projects	• Special Permit by City Council • For: multi-family dwellings by Special Permit for 21 or more bedrooms, 11 or more dwelling units; hotel, motel for 30 or more rooms; shopping centers • Must submit: plans by engineer, photos, and percolation tests • Review and report by Building Inspector, Public Health, Public Works, Fire, Engineering, and Conservation Commission • Copy to Planning Board for special permit criteria • Special Permit Criteria: access, good percolation tests or connections, no less than 100' from wetland, drainage, utilities requirements of Subdivision Control Law and Zoning, additional criteria for shopping centers
	Wastewater Management Overlay District	• West Gloucester Overlay District places restrictions on growth within a 3,301 acre area • Prevents immediate development of 1.326 lots in West Gloucester • Subdivisoins that result in four or more lots will require the approval of the planning board through the special permit process and are prohibited from connecting to the city sewer • Subdivisions must provide for the installation of septic systems that meet Title V standards and will not have access to sewer lines for five years unless their septic system fails • District will remain in place for five years during which time a permanent growth management plan will be developed

City of Gloucester General Wetlands Ordinance *(Dated 9/26/90, revised 5/5/92)*	
Jurisdiction	• Wetlands Maps (1977-78) • Coastal and freshwater wetlands; areas bordering on water body or land within 100 feet of these areas; land under a water body or subject to flooding tidal action or coastal storm flow, vernal pools, or ACECs; land within 100 ft of Parker River/Essex Bay ACEC (upland edge); land within 200 feet of the upland edge buffer zone - this means jurisdiction extends a total of 300 ft from the ACEC; cannot remove, fill, dredge, alter or build upon • Exceptions: maintenance and repairs of utilities, ways, or buildings existing at time of ordinance adoption; removal of debris by hand; emergency projects; planting and harvesting of commercial crops and residential gardens etc within the buffer zone; application of pest/herbicides in accordance with State and Federal law. • Projects altering isolated wetlands of size 2,500 square feet or greater are subject to review • Assume resource areas are significant until proven otherwise
Performance Standards	• Performance standards for any work in these areas will employ Parts II and III of Wetlands Act with addition of: marsh, swamp, bog, or wet meadow – apply performance standards for bordering vegetation wetlands • Upland Edge – no vegetative cut allowed (other than vegetables, crops, flowers), no impervious surface added, no drainage or septic system within 100' of upland edge (200' from ACEC) • Can alter if in existence prior to Subdivision Control Law or reconstruction within same footprint • Commission may impose conditions and all work shall conform
Submission Standards: Determination of Applicability and Notice of Intent	• Request for determination by applicant – Conservation Commission makes written determination • Notice of Intent to perform work that is not under exceptions • Application includes information that Commission deems necessary to describe activity • Burden of proof on applicant to prove no adverse affects • Public Notification in paper; hearing within 21 days of submission • Combine hearing with one under MA General Laws Ch 131 S 40 • Review by other Officials: Board of Health, City Engineer, Council, Planning Board, Zoning Board of Appeals, HarborMaster, Shellfish Advisory Committee, Tree warden • If Environmental Impact Report exists, may consider that in decision
Permit and Conditions, Security	• May issue or deny permit; may impose conditions if significant effect • Deny when failure to meet design specifications, performance standards, failure to avoid significant or cumulative adverse effects • Security bond, conservation restrictions, easements or other covenant to secure conditions • No work undertaken until recordation • May request certificate of compliance upon completion of work
Violations; Penalty	• Authority to enter upon privately owned land • Authority under violation notices, administrative orders, civil and criminal court action • Administrative penalty higher if no compliance after notification of violation, penalty if not meeting conditions, or where significant damage has occurred
Flood Plain Management	• "Flood Insurance Study for the City of Gloucester" (dated May 1984) with Flood Insurance Rate Maps and Boundary-Floodway Maps were adopted • Defined coastal high hazard areas and floodways – no construction • A Zones – constructions must be elevated or flood proofed • Health regulations: prevent infiltration of flood waters into water supply and into sanitary systems and prevent discharge from sanitary sewage systems into flood waters • Submittal requirements: site plan with location, boundaries, dimensions, contours, existing and proposed structures, watercourses, drainage easements, access, sewer facilities, leaching fields, base flood elevation for 100 year flood plain

Planning Board Rules and Regulations Governing the Subdivision of Land in Gloucester, MA *(Adopted by the Planning Board and effective April 1, 1970)*	
Approval Under Subdivision Control Law Not Required	• Plans submitted with all zoning classification, locations, boundaries, references, lot dimensions, frontage, streets, topography, and natural features • Board considers: lots fronting on maintained public way; way in existence pre-law and is adequate (no steep slopes or watercourses within access way); or buildings on each • Either endorse or notify applicant that approval IS required • Adequate access is also considered prior to construction on existing lots – determination by Planning Board • If not adequate- Rules and Regulations govern improvements • Must show existence of lot prior to Subdivision Law and existence of Public Way • Submission materials - boundary lines, right of way, traveled way, topography, cross section • Must meet design standards, road surface requirements, and lengths • Public hearing and comment; approve or deny by Planning Board; Recordation • Performance Guarantee or covenant and a Road Improvement Plan may be requested
Preliminary Subdivision Plan	• Submission of preliminary plan to Planning Board and Board of Health is strongly recommended • Submission of plans with info, including wetlands and waterbody locations, topography, drainage systems, soil test site and description, zoning, Environmental Impact Environmental Evaluation*, Stormwater Management Plan*, and traffic impacts if >20 lots • Plans forwarded to: Board of Health, Department of Public Works, Fire Department, and other municipal agencies • Approve; approve with modifications; or disapprove – but not recorded until definitive plan approval * ***Environmental Impact Evaluation***: Board considers: water re-circulation, maintenance of flow and quality of surface water, preservation of wildlife refuges, historic sites, geology, botany, archeology, trails and access to open space, health and safety. Must submit statements about: physical environment (including ACEC boundaries), surface water and soils, subsurface conditions, city services, human environment, phasing of construction, general impacts * ***Stormwater Management Plan:*** For purpose of control of the quantity and quality of stormwater runoff. Must submit: existing environmental and hydrologic conditions (direction, flow, rate, volume under 2, 10, and 100 year storm events, location of collection or percolation, description of waterbodies and classifications, depth to groundwater, flood plains, vegetation, topography, soils); proposed alteration and site arrangement and drainage systems; predicted impacts; measures for detention, infiltration, erosion impacts; nitrogen/phosphorus loading Contains performance standards, design standards, and monitoring and maintenance standards
Definitive Subdivision Plan	• Written notice to Board of Health and Planning Board • Definitive plan by Engineer and signed by surveyor and landscape architect (if >5 lots) • Submit: street layout, drainage calculations for culverts, locus plan, soil test sites and description, Environmental Impact Evaluation, any variances, and determination of nutrient loading if within watershed or contributing area (described in appendix) • For >20 lots: Traffic Impact Report including existing features and zoning • Provision for ownership of open space • Stormwater Management Plan • Plan to include: all streets, walkways, bearings, slopes, major features (wetlands, waterbodies, wells, drainage courses), topography, proposed layout and profile of drainage structures and basins, course of discharge, profiles of sewer lines, street cross sections, trees, plan for erosion and sediment control, and calculations and areas of lot size and number, streets, wetlands, open space, easements, floodway or flood plain • Public hearing – Board of Health provide written report for approval or disapproval with response from Public Works, Fire Dept, Building Inspector, and Conservation Commission • Approve; approve with modifications; or disapprove • Performance guarantee (bonds, covenants, agreements with lenders) required before endorsement of plan • Maintenance of streets until conveyed or transferred title to Town
Requirements for Improvement and Design	• Design of subdivision must take into account: design standards for public safety; lot compliance with provisions of zoning; street location and alignment, width requirements, grades, construction; standards, specifications, and criteria for storm drainage, water facilities, sewer, sidewalks, utilities, fire; public uses including easements, open space, walkways, bikeways; natural features including preservation, grass plots, and required tree planting

APPENDIX C: INTERVIEW QUESTIONS

INTERVIEW QUESTIONS FOR ACEC MUNICIPAL OFFICIALS AND VOLUNTEER BOARDS

(planning board, conservation commission, and open space committee members in each of the five ACEC municipalities were interviewed in Spring/Summer, 2000)

RESOURCE ISSUES

1. What are the town's primary natural resource issues?
2. Has the town been successful in addressing these issues - why or why not?
3. What is the primary reason for success or the biggest barrier to tackling the issues?

REGULATORY TOOLS FOR RESOURCE PROTECTION

4. What is most effective about your bylaws/regulations for protecting resources? What is missing?
5. What are barriers to improving your existing bylaws or regulations?
6. Do you need any new bylaws or regulations? Have you seen useful models?
7. How readily does the town grant variances? In what instances are they most often used?
8. Is enforcement successful – why or why not? How could it be improved?
9. Do you administer and enforce fines for violations?

NONREGULATORY TOOLS FOR RESOURCE PROTECTION

10. Is there coordination between boards/staff during the project review processes? What do you need to help improve coordination?
11. If you do not currently have a master plan, what are barriers to developing one?
12. Is your open space plan being implemented? What resources do you need to help with implementation?
13. What types of resources or assistance do you need to begin using GIS? In what instances would you find GIS most useful? What other data management and mapping approaches do you use?
14. Does the town apply for grants (Coastal Pollution Remediation, volunteer monitoring, etc)? What are some barriers to seeking funding for the town?
15. Do you receive technical assistance from state or federal agencies? What do you find most useful? What are some needs that could be addressed with this type of assistance?
16. What kinds of training or workshops would be useful for your staff or volunteer boards?
17. Who are the primary stakeholders in your town that are most interested in resource protection?
18. What are other nonregulatory approaches you would like to use for resource protection that we haven't already talked about?