

CHAPTER 4

Natural Resources

*Westport Master Plan * 2004*

4. Natural Resources

4.1 Introduction

Protection of Westport's natural resources is an essential element of the overall Master Plan. Westport's earliest settlers were attracted by this area's abundant resources: the river and its estuaries, the ocean front, shellfish beds, wildlife habitats, the inter-tidal zone of beaches, salt marsh and primary and secondary dunes. These assets, together with the farmland, woods, wetlands, ponds and upland wildlife, provide a wonderful mix of resources for residents and tourists. Development is putting great stress on these resources, and it will only increase. Groundwater, surface water and wetlands have been contaminated in some areas, wildlife habitats are shrinking, and open land is vanishing. The Town's planning must confront this trend and point the way toward sensible growth while protecting the Westport's valuable resources.

Our natural resources serve the Town well beyond their natural beauty. They provide for recreational and commercial fishing and shellfishing, farm produce and lumber, as well as a thriving tourist industry. Of critical importance is the dependence of Westport residents on private wells for domestic water and private septic systems for waste disposal. (See Water and Sewer element.) To protect and preserve our natural resources we must manage them wisely.

Westport has taken several significant steps to protect its natural resources. In order to protect the Town's high yield aquifers, at the spring 1998 Annual Town Meeting voters passed an Aquifer Protection District Bylaw. In addition the Board of Health has adopted regulations that include: surface water protection that requires repairs of existing septic systems within 50 feet of water bodies to include systems that limit nitrogen loading; water supply well quality testing that includes tests for volatile organic compounds on all new and replacement wells; and that large capacity water supply wells drawing over 10,000 gallons/day will not adversely affect neighboring wells or water supply areas.

Certain additional measures to ensure the long-term protection of natural resources can be addressed through additional regulations or incentives; others will depend on the stewardship and vigilance of the Westport's residents.

4.2 Goals and Objectives

4.2.1 Goal 1 To preserve, protect, restore and enhance Westport's natural resources, including its soils, ground water/aquifer, fresh waters, salt waters, shoreline, wetlands, and wildlife and plant habitat

Objectives to address Goal One:

- Prioritize and address current impacts on the natural resources
- Preserve critical wildlife habitats
- Protect by purchasing open space over aquifer recharge areas
- Educate residents on the proper use, and impact on water quality, of pesticides and fertilizers
- Support financially and reviewing regularly the Harbor Improvement Plan
- Develop a beach nourishment plan for the dune and barrier beach area
- Consider a moratorium on the construction of docks and moorings, until a resource study of the river is completed
- Develop and enforce water use regulations that protect environmentally sensitive areas in the river and estuary.

4.2.2 Goal 2 To devise ways that allow, but control, development in order to sustain Westport's bountiful natural resources and assure that these resources are enjoyed by future generations.

Objectives to address Goal Two include developing and adopting bylaws and/or regulations that:

- Limit land clearing and alteration of the natural topography prior to development review
- Govern new development and redevelopment
- Address storm water runoff
- Protect buffer zones, wetlands and water supplies
- Promote environmentally responsible water usage and land management practices for recreational land.

4.3 Geology, Soils, Topography

Westport's most significant natural features are the Westport River and Horseneck Beach. The two branches of the Westport River cover almost 3,300 acres, provide 35 miles of shoreline and drain 85% of the Town's land area. The river serves as a breeding area and habitat for numerous species of fish, animals and plants. Horseneck Beach is a state recreation area and a barrier beach with over 4 miles of shoreline on Rhode Island Sound and Buzzards Bay. It is the Commonwealth's third most popular recreation area.

Over one half of Westport's land area is forested and many of these areas cover hundreds of acres of unbroken forestland. The variation of forest to open fields creates one of the basic landscape patterns that define Westport.

In addition to its primary purpose as an economic activity providing jobs and food, active farming creates a unique open landscape. Westport's farms provide views of agricultural areas such as: pastures, corn and other produce, vineyards, cows, horses, other livestock and a variety of small fruit orchards. Westport's open, coastal agricultural landscapes, a landscape type fast disappearing in Massachusetts, also allow the public to glimpse the coastline and river as they go about their daily activities.

The land surface of Westport is hilly, but the elevations are fairly gradual. The southern section of the Town has two large estuary areas formed by the East and West Branches of the Westport River. Westport is almost completely surfaced with good texture, well-watered loams with marshlands bordering most of its many streams. The coast is bordered by a strip of sandy soil to a width varying from $\frac{1}{4}$ to $\frac{1}{2}$ mile wide. The Town has a tidal shoreline of 35 miles. Total land area is 53.01 square miles. The Town's character is mixed, ranging from extensive suburban development in the north to rural residential and agricultural in the south.

Westport is characterized by a variety of soil types that have differing implications for open space and recreation opportunities. Because Westport does not have a municipal sewer system, a large portion of Westport contains soil types that are classified as being difficult to develop. This limitation is primarily related to a high water table or to an impermeable soil layer (hardpan) that impedes water percolation. Forty-five percent of the soils fall into the category of having severe limitations due to wetness (Whitman, Scituate, Ridgebury, muck, peat, and marsh). Another thirty-one percent of the soils have severe limitations due to hardpan (Millis and Paxton). In general, the Millis and Paxton

soils have good potential as habitat for open land and woodland wildlife and have value from an open space point of view.

Wet soils with a seasonal high water table, at or near the surface, are clearly a problem in Westport. The areas having these types of soils are generally in the valleys between the ridges and hills. Most of the development in Westport has historically occurred along the ridges where wetness is not a problem.

Because these high lands are also important for agricultural use, the Town is likely to face more pressure for development in the less desirable wet soils. The consequence of this situation is that efforts to preserve agricultural land will put the Town in direct competition with development interests. The majority of Westport has been categorized as having prime farmland soils or soils of statewide agricultural significance. "Prime" farmland is defined on a set of Natural Resource Conservation Service (NRCS) criteria that identify soils best suited for growing crops.

Despite the presence of important agricultural soils, due to a variety of somewhat contradictory regulations, Westport must recognize that it is planning within a regulatory system that tends to push development toward farmlands. Although other areas of the world allow waste disposal systems that allow the development of marginal lands, Massachusetts is governed by Title 5, which sets limits for residential properties that use septic systems. These systems need well-drained soil conditions and thus are not suitable for high clay, high water table or highly permeable soils. Farmlands tend to have the characteristics most suitable for septic systems.

Westport also contains a significant area of dune sand and coastal beach soil and associated tidal marsh soils (2,250 acres). This area, found along Westport's Atlantic Ocean coastline, is one of the most significant landforms in the Town. A large portion of this area, composed principally of the Horseneck Beach State Reservation, is publicly owned and protected from future urban development. However, this is a very desirable location for recreation and is also a very fragile environment. Every effort should be made to manage this area for the future enjoyment of the Town's residents.

4.4 Water Resources

Please refer to Map 4-1 for a depiction of Westport's Water Resources.

4.4.1 Wetlands and Floodplain

While the Massachusetts Wetlands Protection Act provides significant protection for wetlands in Massachusetts, many communities have chosen to supplement this Act with local wetlands regulations in order to provide additional protection, as well as greater local control over the review of projects proposed in or near wetlands. The Conservation Commission may want to consider stronger wetlands regulations to further protect Westport's wetlands.

4.4.2 Vernal Pools

Vernal pools are temporary bodies of freshwater that provide the only breeding habitat for several rare or endangered amphibian species, as well as habitat for other animals. Ideally, a one hundred-foot wide, no-build buffer should be provided around vernal pools, since the amphibian species that breed in these pools also require adjacent upland habitat in order to survive during the adult stage of their life cycle. In the late 1980's, the Commonwealth's Natural Heritage and Endangered Species Program certified eight vernal pools in Westport. Their locations can be found on the Mass GIS Natural Heritage and Endangered Species map.

4.4.3 Surface Water

There are six major bodies of water in the Town, with the Westport River system being the largest. The two branches of river cover almost 3,300 acres, provide 35 miles of shoreline and drain 85% of the Town's land area. In the tidal portion of the river, both the East and West Branch are of limited suitability for bathing and shellfishing depending on current bacterial counts. Industrial and municipal treatment plants are not present in either branch of the river, although prior to 1990 the sewage treatment system from Lincoln Park was a known source of pollution to the upper East Branch. The area around Lake Noquochoke, a secondary drinking water supply for the City of Fall River also rated as being suitable for contact recreation, just began to receive municipal sewer service in the fall of 1998.

The East Branch of the Westport River has significant shellfish resources and the estuary has more salt marsh acreage than any other embayment in Buzzards Bay. Although records indicate that eelgrass beds are plentiful in the river system, recent mapping done by the state indicates there has been a dramatic decline in the river's total eelgrass bed acreage.

Similarly, the West Branch of the Westport River also has significant shellfish resources. This estuary has the fourth greatest salt marsh acreage (after the East Branch), and more acres of eelgrass than any other Buzzards Bay embayment where eelgrass has been mapped. Here, too recent mapping demonstrates a decline in eelgrass beds.

Nitrogen Loading Evaluation

Both branches of the Westport River suffer from excessive nitrogen loading from their surrounding watersheds. Most anthropogenic nitrogen loading to the East Branch of the Westport River is derived from residential land use, closely followed by cropland, then other development and farm animals. It is worth noting that farm animals (primarily dairy cows) play a far more important role in fecal coliform loading and shellfish bed closures than in contributing to coastal eutrophication. Non-migratory birds, predominantly swans and geese (which often congregate in flocks of over 100 birds in small embayments along both branches of the river) also contribute to the problem of nitrogen loading.

Existing nitrogen loading in the East Branch is currently at 297% of the recommended limit. (Westport 1999 Open Space Plan, pg. 40). The East Branch ranks poorly in terms of water quality (falling in the lowest 25 percentile in dissolved oxygen concentrations) according to a subwatershed evaluation report produced by the Buzzards Bay Project. The study used four years of water quality monitoring data and compared 17 embayments. Similarly, existing loadings in the West Branch are 127% of recommended limits. Historical aerial photographs suggest eelgrass beds have disappeared in the upper estuary (Costa, 1988), and this finding is consistent with the effects of eutrophication.

Because the watershed still has considerable growth potential, future inputs of nitrogen may far exceed recommended limits. Additionally, because this watershed is large and includes three other municipalities and will require implementation of agricultural Best Management Practices (BMP's), nitrogen management in this watershed is expected to be challenging. Continued nitrogen monitoring is recommended.

For discussion of Aquifers and Water Supply please see Chapter 12 Water and Sewerage.

4.4.4 Shellfish Habitats

Shellfishing in Westport began with the Native Americans; however, the early settlers soon learned to utilize the river's shellfish resource. The Westport River is an estuary with two branches. The East Branch has 2,018 acres and the West Branch has 1,425 acres. In addition to the estuary's shellfish resources, an additional 18,000 acres exist off Horseneck Beach (Rhode Island Sound) and Gooseberry Island (Buzzards Bay). In 1987, inside the harbor, the river was divided into shellfish classification areas - prohibited, conditional, and unconditional. These areas were established under the auspices of the Division of Marine Fisheries and their concern to safeguard public health with regard to the consumption of raw contaminated shellfish. Pollution comes from five major categories: storm water runoff from streets and catch basins, malfunctioning septic systems, non-migratory water fowl, agriculture, and boat waste. River dredging in specific areas to increase tidal flushing could improve water quality in prohibited and conditional shellfish bed areas.

Westport's primary shellfish resources are Quahogs, American Oysters, Surf Clams, Soft-shelled Clams, Blue and Ribbed Mussels, and Bay Scallops. Since 1947 a full time Shellfish Warden has been overseeing and managing the Town's shellfish resources. Work today involves patrolling the river and checking shellfish licenses and planting or "relaying" seed shellfish (quahogs, bay scallops, soft-shelled clams, and oysters) in appropriate areas. The shellfish department also works closely with the Southeast Shellfish Association (SSA), which has an aquaculture grant to maintain a small hatchery to spawn seed and distribute the seed in two sites in the river. SSA's mission is to increase shellfish stocks in the Town. These programs along with the seed purchase opportunity from the Shellfish Seed Fund enhance the shellfish resources in the river.

In 2003 nearly 759 people obtained either a commercial or recreational shellfish license to harvest shellfish in the river.

4.4.5 Tidal and Coastal Areas and Harbor Management

4.4.5.1 Barrier Beaches

Westport has six state and federally designated barrier beaches that measure approximately 729 acres. The barrier beach, known as Horseneck Beach and Cherry & Webb Beach is one of the most popular beaches in Massachusetts. On a busy summer day, over 10,000 people visit this area. In 2003, the Town Clerk issued 2,491 beach stickers to residents for Westport's Town Beach portion of this barrier beach, known as Cherry & Webb Beach.

Barrier beaches are geologic land forms defined under the Massachusetts Wetlands Protection Act (MGL CH. 131, Sec. 40) as narrow, low-lying strips of land consisting of coastal dunes extending roughly parallel to the trend of the coast. They are separated from the mainland by a relatively narrow body of fresh, brackish, or saline water by a salt marsh system. A barrier beach may be joined to the mainland at one or both ends.

Barrier beaches function significantly as flood control areas as well as feeding and breeding grounds for coastal and migratory birds. The sands of a barrier beach can absorb the force of storm waves and the reshaping of beaches and dunes by waves, providing building material for beaches down-current. Barrier beaches also ease the effects of erosion. Westport's barrier beaches play a critical role in providing a protected harbor for commercial and

recreational fishing boats. If the river were dredged, the dredging spoils would be suitable material to nourish the barrier beach system at the entrance to the harbor.

4.4.5.2 Management of Westport Harbor Resources

Background/History

From whaling to clamming, since the early 1700s Westport has been a vibrant harbor for the fishing industry. At this time there are approximately 1,280 registered moorings and slips.

Today Westport Point is the home of the Town docks that abut historic Lees Wharf. In 2000-2001 the entire Town Dock pier and wharf area was rehabilitated. Approximately 32 commercial fishing vessels are docked here, including: 7 offshore lobster boats that fish exclusively on the outer continental shelf; 7 coastal lobster boats that fish near shore out to 40 miles; 6 inshore lobster boats that fish primarily in Buzzards Bay and Rhode Island Sound, and 1 tug boat used for installing new docks. There are also 7 working skiffs at the mud dock that are used for scalloping, quahogging, clamming and inshore lobstering. The current commercial fishing industry employs approximately 65 people at the Town docks. During the winter months many of the fishing boats tie up or convert to gillnetting.

The river is accessible from several Town landings (Adamsville, Head of Westport, and Hix Bridge) and a busy State Boat Ramp located just over the Fontaine Bridge on Rte. 88. There is also a boat ramp on Gooseberry Island that directly accesses Buzzards Bay. On most summer weekends the river and harbor are very active with boaters, Jet Ski operators, swimmers, and shellfishermen. The Harbormaster and staff regularly patrol the area from April to December. With the harbor designated a “no discharge zone”, the Mobile Pumpout vessel is busy throughout the boating season. It should be noted that many moorings have boats or houseboats that are weekend residences.

Dredging

In an effort to document existing baseline harbor/river features, in September of 2000 Col-East Incorporated completed aerial photography of the entire Westport River system. The Harbor Advisory Board and Board of Selectmen’s office have a copy of the original photographs. The photographs have also been given to the Department of Environmental Protection’s Waterways Division to use in the event of hurricane impact. It is hoped that new photos would be taken every three to five years to use as a tool to monitor changes in the river, harbor and coastline areas.

In the 2000 Annual Harbor Report, dredging of the harbor is suggested for several locations in the river and harbor areas. The proposed dredging project as outlined in the 2000 Annual Harbor Master Plan would use dredged material as beach nourishment on what is known as “boat beach“, located at the northern end of the Town’s Cherry & Webb Conservation Area. This was favorably approved in the Harbor Master Plan as the dredged materials consist of sand that had originally existed on the beach and, due to wind and water erosion, been blown off the beach into the estuary over many years. It is ideal material for beach nourishment.

At this time, 2004, two separate dredging projects are planned. One project, funded primarily by the Federal government and overseen by the Army Corps of Engineers, involves dredging the main channel of the river from inside the Knubble to the #23 green channel marker. As suggested in the Harbor Master Plan, the spoils will be deposited on the Town Beach/Conservation area as a method to restore and nourish the depleted dune/beach system in that location.

The second project involves dredging the mud docks at the Town wharf. This is a state-funded project with funds set aside from the Environmental and Seaport Bond. Both projects require matching funds from the Town. With that in mind, for a three-year period, Westport has implemented a \$1/foot surcharge on each registered boat and has created a gift fund to which residents may make tax-deductible contributions for harbor improvements.

4.4.6 Vegetation and Wildlife

Please refer to Map 4-2 for a depiction of the various habitats found in Westport.

4.4.6.1 Forestland and General Inventory

Approximately 10% of Westport's land area is in urban land use - commercial, residential or industrial. The predominant land uses are forestland (54%), agricultural and open land (19%) and wetlands (16%). Within the category of forested land, larger hardwood forest stands are the most common, and comprise 56% of the forestland. Larger mixed hardwood forest stands (hardwoods and softwoods with hardwoods predominating) are also important, and comprise 24% of the forestland. The remaining areas are smaller hardwood forest stands (10%) and smaller mixed hardwood forest stands (8%). Coniferous forest stands cover only a very small area.

Nearly 46% of the forestland can be described as hardwood forest stands (with hardwoods comprising at least 80% of the stand) of 41 to 60 feet in height with a high canopy density (80% to 100% crown closure). Another 19% is a mixture of hardwoods and softwoods (with hardwoods predominating) also 41 to 60 feet in height with a high canopy density. Most of Westport is covered by a forest type composed of oak (especially black oak) and hickory. There is a small area where the predominant species are elm, ash and red maple and another smaller area where white and red pines predominate. Other tree species that are commonly associated with the forest cover type found in Westport are black cherry, gray birch, black locust, American beech, and northern red oak. Forested wetland areas are dominated by red maple and tupelo. Within the agricultural land category, most of the land (67%) can be described as tilled or tillable cropland, which is, or has recently been, intensively farmed. A smaller area (11%) is pasture or wild hay not suitable for tillage. Finally, a large area (19%) can be described as abandoned field, which is reverting to wild land.

4.4.6.2 Rare, Threatened and Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program maintains a database on animal and plant species of the state that are unusual or threatened in some manner. This effort provides an ongoing monitoring process for protecting our most fragile resources. The Program uses a Department of Fisheries and Wildlife categorizing system consisting of the following categories: Endangered, Threatened and Special Concern.

Areas within Westport have recently been identified as habitats for the rare plant *Arethusa* (*Arethusa bulbosa*), also known as swamp-pink. At present, there are only seven current and fifteen historical sites for this species in the Commonwealth. Its preferred habitats are

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sphagnum bogs and peaty meadows. The only two state records for the endangered species Northern gamma-grass (*Tripsacum dactyloides*), are known from Westport. Reaching the northeastern limit of its range here, this rare plant is usually found in moist fields and the borders of woods and shores. Also listed as endangered is the lion's-foot (*Prenanthes serpentaria*). Westport has recorded observances of two species that are considered threatened: gypsywort (*Lycopus rubellus*), last observed in 1925, and Canadian sanicle (*Sanicula canadensis*) which was recorded as last occurring in 1990. The pinnate water-milfoil (*Myriophyllum pinnatum*), the bristly foxtail (*Setaria geniculata*) and the Plymouth gentian (*Sabatia kennedyana*) have historical occurrences in Westport and are considered to be of special concern. The Plymouth gentian was recorded in Westport in 1929, though the Town has not been field-checked for the species since.

The Westport River estuary is one of the prime breeding sites in Massachusetts for the osprey (*Pandion haliaetus*). In this area, ospreys have nested both on specially constructed platforms and tall dead trees along the islands and riverbanks. Ospreys were disappearing from the region in the 1960s due to the effects of DDT on their reproductive cycle and disturbance of natural habitat. In 1967 only 9 nests and 5 young were produced. Today, due primarily to the efforts of Dartmouth residents Gil and Josephine Fernandez, there are over 80 platforms with 65 active nests. In 2002 72 ospreys fledged. It is unlikely that these birds would be present in such large numbers were it not for the efforts of these individuals. Additional information is available at the Westport River Watershed Alliance and the Lloyd Center.

The Westport estuary is also the location of one of fifteen active heron rookeries in the Commonwealth. Black-crowned night herons (*Nycticorax nycticorax*), green herons (*Butorides striatus*), and the rare great blue heron (*Ardea herodias*) have all been sighted here. Because their numbers are so concentrated during the colonial nesting season from March to August, these bird species are ecologically sensitive and vulnerable at that time. There are only nine other current nesting sites for the great blue heron in Massachusetts. Westport is also a nesting ground for the piping plover (*Charadrius melodus*). The Lloyd Center has undertaken a continual monitoring program of this species. A recent study identified the degree to which nesting plovers are compatible with average human beach use. Parameters were defined to aid the plovers in successfully nesting while sharing their habitat with people.

Westport is also a habitat for the rare marbled salamander (*Ambystoma opacum*), considered to be threatened in the state. At this time there are only seven current and ten historical records for this amphibian, which inhabits woodlands with depressions and temporary ponds. Individuals of this species were sighted as recently as October 1990.

The Massachusetts Natural Heritage and Endangered Species Program cites the following wildlife species as being threatened: the marbled salamander (*Ambystoma opacum*), the piping plover (*Charadrius melodus*) and the Persius dusky wing (*Erynnis persius persius*). The following species were sighted in Westport and are classified as being of special concern: the spotted turtle (*Clemmys guttata*), the four-toed salamander (*Hemidactylium scutatum*), the spartina borer moth (*Spartiniphaga inops*), the New England bluet (*Enallagma laterale*), the

least tern (*Sterna antillarum*), the common tern (*Sterna hirundo*), and the Eastern box turtle (*Terrapene carolina*). There are no endangered mammal or insect species listed for Westport.

Additional information is available on-line at www.conservationmapper.org.

4.4.6.3 Fisheries and Wildlife

General Inventory & Corridors

Fisheries

Local finfish species include striped bass, American eel, black sea bass, herring, cod, scup, fluke (summer flounder), tautog, and winter flounder. The Westport River and immediate offshore areas serve as a nursery for the juvenile form of important economic species such as winter flounder, smelt, tautog, pollack, white hake, menhaden, and fluke (summer flounder). Species important for sport fishing, including striped bass, bluefish, winter flounder, tautog, and mackerel, are also present. The major economic shellfish species, which are harvested by both family and commercial fishermen, include bay scallops, quahogs, American oyster and surf clam. Soft shell clams and blue mussels are important recreational species. A recreational and/or commercial fishery also exists for green crabs, blue crabs and lobsters.

Aquaculture

For several years the Town has awarded an aquaculture grant to the Southeast Shellfish Association, Inc. for aquaculture propagation at two locations in the river. Their main effort has been to fund and maintain a hatchery at the Town docks to provide a continual stock of shellfish for seeding the river.

Herring Runs

Anadromous species, such as alewives (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), together known as river herring, have declined dramatically in Buzzards Bay during the past couple of centuries. Historically these fish were an important human food fishery in Buzzards Bay. Although not heavily used for human consumption today, they are still an important food species for many larger fish, whales, and coastal birds. Currently the primary use of herring harvested from Buzzards Bay tributaries is lobster bait.

Most herring runs in Buzzards Bay are not supporting their historical maximum number of fish. One of the primary reasons is that obstructions to migration are stopping or inhibiting the passage of fish upstream to their spawning areas. Other possible reasons that certain runs are not producing fish at their historic level are over fishing or poor water quality. In practical terms, little can be done in the short term to change water quality problems. However, it is possible to improve or restore spawning area access or reduce fish harvesting levels and see increases in the number of river herring in a stream system.

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In 1994, the Buzzards Bay Project, in cooperation with the Buzzards Bay Action Committee, allocated \$25,000 of National Estuary Program implementation funds to restore and enhance herring runs in the Buzzards Bay watershed. These funds were provided to assist communities in constructing new fish ladders or rehabilitate old ladders or river culverts to better facilitate the passage of river herring. The Town of Westport was awarded almost \$2,300 to construct and install the Albert Rosinha Herring Run, a 30-foot fish ladder at the Adamsville Dam above the Rocky Delano Brook. The fish ladder was constructed in 1996 with help from the Westport Fish Commissioners. The Westport Fish Commissioners had noticed a decrease in population of alewives over the past several years and had restricted the days for taking alewives.

There is also an historic fish ladder located at the Head of Westport, just north of Old County Road. This site offers a unique opportunity to restore not only the fish ladder, but also the millpond, and possibly the structures that once existed. Restoration of the millpond would also improve water quality at the Head of Westport, as it would serve as a detention pond, settling out soils and sediments.

Wildlife

The occurrence and abundance of wildlife in the Westport area is influenced by land use, land cover type, topography and availability of water. Wildlife associated with the predominant hardwood forestland cover type include white tail deer, eastern cottontail, grey fox, shorttail weasel, shorttail shrew, opossum, raccoon, striped skunk and several species of mole, squirrel and mouse. Common birds include the ruffed grouse, screech owl, red-tailed hawk, hairy and downy woodpecker, yellow-bellied sapsucker, blue jay, common crow, chickadee, white and red breasted nuthatch, scarlet tanager, turkey vulture, bluebird, robin, bald eagle and cardinal. Several species of reptiles, including the common garter snake and eastern milk snake, are also present.

Wildlife in the open and agricultural land habitat is generally less abundant and diverse. Common species of mammal include whitetail deer, red fox, shorttail shrew, eastern chipmunk, eastern cottontail, woodchuck, meadow mole, striped skunk and opossum. Bird species include bobwhite, ring-necked pheasant, red-winged blackbird, cowbird, mourning dove, bluebird, common goldfinch, starling, turkey vultures, wild turkeys, bluebirds, killdeer and barn swallow. Wildlife commonly associated with the wetland land cover include muskrat, mink, raccoon, otter, beaver, woodcock, catbird, cedar waxwing, osprey, harrier hawk, Canada geese, kestrel and several species of heron, duck, turtle, snake and frog.

The Lloyd Center has conducted yearly studies of the piping plover on Horseneck Beach and the Westport Town Beach since 1987. These studies examine nesting and fledgling behavior in relation to human and other natural activity. Recommendations are made concerning limiting the use of off-road vehicles during the nesting and fledgling seasons, protecting the nesting areas, banning pets from the beach during critical periods and educating beach users about the bird's importance.

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Given the large areas of land in Westport that are open fields and forests, no clear wildlife corridors have been identified to date.

Again, additional information is available at www.conservationmapper.org. A detailed inventory can also be found in the 1999 Open Space Plan.

4.5 Environmental Threats and Water Resource Protection

4.5.1 Environmental Threats

The greatest threat to all water bodies and wildlife habitat is continuing growth of development and overuse of the Town's natural resources.

4.5.1.1 Point Source Discharges

There are no known point sources of pollution.

4.5.1.2 Nonpoint Source Discharges

Several sources of nonpoint discharges exist: storm water and catch basin runoff, agricultural runoff, non-migratory waterfowl, failing septic systems, and pet waste.

4.5.1.3 Groundwater Supply Problems

Leaking underground storage tanks have contaminated drinking water wells with gasoline and Methyl tertiary-Butyl Ether (MtBE). Additional contamination has occurred from underground plumes that have contributed Trichloroethylene (TCE), Chlorobenzene, and Temik to groundwater and contaminated private wells.

4.5.1.4 Westport Harbor and River Problems

Nutrient overloading in the upper reaches of the East Branch of the river have caused eutrophication. Additionally, high bacteria counts have consistently closed the river to shellfishing, and often swimming, north from Hix Bridge.

Efforts to control storm water runoff must be considered in order to improve river water quality.

Areas of the main navigable channel need to be dredged to provide ease of navigation for the existing fishing fleet.

4.5.2 Priority Areas for Water Resource Protection or Enhancement

- Westport's high recharge aquifer areas
- Westport's moderate aquifer recharge areas
- 200-foot buffers along the river and its tributaries, as well as around ponds

4.6 Resource Sensitivity Analysis

4.6.1 Introduction

Because Westport is so rich in natural and cultural resources, the Master Plan Update Committee contracted with planning consultant Beals and Thomas, Inc. to perform a Resource Sensitivity Analysis, a process that has been used by many communities in Massachusetts as an integral part of their Master Plans. This process is a typical planning process in which a resource, whether it is a natural resource such as groundwater, or a cultural resource such as historical sites, is studied in

several stages before conclusions and recommendations are made as to how best to manage and protect it. First the resource is inventoried or mapped. Then the raw data is assessed and assembled into a more meaningful or understandable form, which allows prioritization of the most important or sensitive resources and, finally, planning for protection or management of the resource may begin. The resources analyzed for this Master Plan were both natural resources and cultural resources, such as historical and scenic areas. With the rapid increase in data available in geospatial or GIS form, planners can use computers to perform this analysis much more quickly than with the manual calculation methods formerly used, and the results can be clearly depicted graphically as overlay maps.

4.6.2 What is a Resource Sensitivity Analysis?

The final product of the Resource Sensitivity Analysis is a computer-generated or GIS map, which shows, by a gradient of color shading from light to dark, resource areas that are less sensitive to most sensitive. In other words, dark areas, representing areas where more than one resource co-exist, are the most valued and most sensitive areas, which need the most protection and management.

4.6.3 Process - What Methodology and What Data Were Used to Perform the Analysis?

The following discussion is adapted from Beals & Thomas' report to the Town, with additional explanatory material added. In order to create the Resource Sensitivity Map, two sets of information were required: a set of maps showing the extent of each resource category (such as water supply protection areas or agricultural lands), and a ranking of these resource categories to show how important each is to the community. The data used to create the maps was from MassGIS and local data, current as of 2001.

After this information was gathered, the data were processed in a geographic information system (GIS) processor. First, resource areas (e.g. aquifers, wellhead protection areas, and surface water protection areas) were merged to produce one map "layer" for each resource category (Water Supply Protection). The resulting ten map layers produced from each of ten resource categories represent the areas important for each resource category. For instance, the layer created from aquifers, wellhead protection areas, and surface water protection areas represents all areas in Westport that are important for the protection of current and future water supplies.

Table 4-1 lists in alphabetical order the ten Resource Categories, some of which are composed of several components, also listed.

Table 4-1. Resource Categories and Their Components

Resource Category	Components
Agriculture	APR parcels Chapter 61A parcels
Biological Diversity	1000' buffer around NOAA ⁶ rare species locations 200' buffer around NHESP ⁷ certified vernal pools and potential vernal pools NHESP estimated habitat of rare wetland wildlife NHESP BioMap core habitat areas NHESP BioMap supporting natural landscape areas
Coastal Resources	300' buffer around shellfish locations 1000' modified buffer around anadromous fish locations Eelgrass areas and 200' buffer Lobster harvest areas and 200' buffer Barrier beaches 1000' public beach buffer
Flood Storage Areas	FEMA 100- and 500-year flood zones
Forested Land	Chapter 61 parcels
Historic	Culturally sensitive areas
Recreation	Chapter 61B parcels
Scenic Areas	200' buffer around scenic roads
Water Supply and Quality	Interim wellhead protection areas Aquifers Zones A, B, and C (surface water protection areas)
Wetlands and Streams	Wetlands (digitized at 1:5,000) 200' buffer around streams

These resource category layers were then assigned scores depending on the community's ranking of each resource. Table 4-2 shows the Master Plan Update Committees ranking of the ten resource categories, in order of decreasing importance.

The points assigned to each resource category were then attached to the corresponding map layer. For example, 29 points were allotted to any area in Town that fell within the water supply protection layer. A location in Town would thus score 29 points for being within this area or 0 points for being

⁶ National Oceanic and Atmospheric Administration

⁷ Massachusetts Natural Heritage and Endangered Species Program

outside it. These layers were then superimposed on top of one another. The result is a tally of all the points received for every location in Town.

For instance, several agricultural properties near Sodom Road also fall within the biological diversity resource layer. These areas were awarded a total of twenty-two points: sixteen because they are within the agricultural resource layer, and six because they are within the biological diversity layer.

Table 4-2. Community Ranking of Resource Categories

Resource Category	Points
Water supply and quality	29
Agriculture	16
Coastal resources	12
Scenic	9
Historic	8
Wetlands	7
Recreation	7
Biological diversity	6
Forest	5
Flood storage	1
Total	100

Map 4-3. Resource Sensitivity Analysis (Town Weighted) depicts the scores by color. Those areas that received the most points appear darker than those receiving fewer points. Those areas that appear white are outside all of the ten resource category layers.

4.6.4 Results and Discussion

4.6.4.1 Introduction

Three main sensitive areas in Westport emerged from this analysis: 1) an area in the northwest bordering South Watuppa Pond, 2) lands adjacent to the East Branch of The Westport River from Hix Bridge Road to Head of Westport, and 3) coastal areas in the southern end of Town. Following is a discussion of each of those areas. In addition to referring to Map 4-3, please refer to Map 4-4, Interpretation of Analysis for a written description of which resources categories are responsible for the sensitivity rankings on Map 4-3.

The resulting sensitive regions reflect the community ranking of resource categories (Table 4-2). Because such a high ranking was given to "water supply and quality", almost all of the significantly sensitive areas contain land that is important for the water supply.

4.6.4.2 The Region Adjacent to South Watuppa Pond

This area appears more sensitive than other Westport land chiefly because it drains into the Pond, which is a reserve water supply. Other factors make certain areas within this part of Town more sensitive; these include agricultural lands (Chapter 61A parcels), scenic roads, and landscape supporting biological diversity.

4.6.4.3 The East Branch of the Westport River from South of Hix Bridge Road to Rte 177

This second sensitive region, again, appears especially sensitive because it contains an aquifer that is potentially significant as a water supply. This region's coastal resources, agricultural properties, and wetlands make it still more sensitive. The most sensitive area within this region is Head of Westport, because that area is also culturally sensitive, containing many historical resources.

4.6.4.4 The Southern Region of Town within a Mile of the Ocean

This region contains a number of wells, the wellhead protection areas of which make them especially sensitive. However, the high sensitivity ranking in this area is also due to numerous other resources: coastal resources (including lobster harvest zones, public and barrier beaches, eelgrass growth areas, and anadromous fish areas), wetlands and streams, the Acoaxet and Westport Point culturally sensitive areas, scenic roads, and biological diversity (including BioMap core habitat, NHESP habitat of rare wetlands wildlife, and NOAA rare species locations).

4.6.4.5 Other Sensitive Areas

While the above three regions stand out as the most sensitive, Westport has areas throughout Town that stand out as sensitive when looked at from a broader perspective. These include a region near the Adamsville culturally sensitive area, the Central Village area and two aquifer areas near I-195. One last region of note is the area of primarily agricultural use adjacent to Sodom Road. This area contains many Chapter 61A parcels, demonstrating extensive agricultural use. This, one of the largest contiguous areas of temporarily protected agricultural land, lies within the largest contiguous areas of Core habitat area for rare wildlife according to NHESP's BioMap program. Within this area are also two NHESP estimated habitats of rare wetlands wildlife and many potential vernal pools, as mapped by NHESP.

4.6.4.6 Application of Results

The Resource Sensitivity Map and Interpretation of Analysis maps should be used by all Boards involved in land use decision-making. This would include the normal project reviews conducted by the Planning Board and Conservation Commission, Board of Health, and Zoning Board of Appeals. In addition, the maps should be consulted when siting public facilities, selling Town land, and acquiring lands. Map 4-4, Interpretation of Analysis should be particularly useful for developing a strategy for land acquisition. This map shows the Chapter 61 lands in Westport, along with the resource sensitivity of each parcel. This information may be used to develop a priority list for future land acquisitions.

4.7 Environmental Regulations

Westport's Conservation Commission and local citizens are the "first line of defense" in protecting wetlands. For this reason, the Town should provide detailed public information about environmental regulations that apply to residents and businesses in Westport with respect to wetlands, water quality, and wildlife issues. This information is useful not just for developers, but also for homeowners whose yard might abut or contain a wetland area.

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In addition, the Conservation Commission and other Town boards should vigorously and responsibly enforce federal, state, and local environmental codes, regulations, and policies that protect wetland resource areas and critical wildlife habitats, including, but not limited to:

- The Federal Clean Water Act, §401 (Water Quality Certification Program)
- The Federal Clean Water Act, §404 (dredging and filling activities)
- M.G.L. Ch. 131, §40, the Massachusetts Wetlands Protection Act
- M.G.L. Ch. 30, §§61-62H, the Massachusetts Environmental Policy Act
- Acts of 1996, Ch. 258, the Massachusetts Rivers Protection Act
- M.G.L. Ch. 21, §17B, the Massachusetts Scenic Rivers Act
- M.G.L. Ch. 130, §105, the Coastal Wetlands Restriction Act
- Acts of 1990, Ch. 408, the Massachusetts Endangered Species Act
- 314 CNM 4.00 and 5.00, Massachusetts Water Quality regulations
- 310 CMR 10.00, Wetlands Protection Act
- 310 CNM 15.00, Title V regulations
- 310 CMR 12.00, Areas of Critical Environmental Concern
- The Massachusetts Storm Water Management Policy
- Westport's Zoning and Non-Zoning By-laws

Westport has taken an important step toward ensuring fair and effective enforcement of these regulations by hiring a planner, who serves as the Administrative Assistant to the Planning Board, and a Conservation Agent. The Town should maintain these positions and continue to provide ample financial, administrative, and instructional resources for the review and protection of its wetlands, water quality, and wildlife interests. In addition, if necessary, the Town should retain consultants and other skilled personnel to review project applications, implement and manage applicable environmental regulatory programs, and conduct public outreach related to the protection of natural resources. Under a local wetlands protection by-law, funding for such programs would be at least partially available through project review fees.

4.8 Implementation/Action Plan

Stewardship Actions

1. Preserve critical wildlife habitats.
2. Continue certification of vernal pools.
3. Obtain funding for harbor dredging.
4. Update and support the Harbor Improvement Plan annually.
5. Continue annual beach and dune nourishment. Limit public access to dune areas.
6. Develop a Shellfish Management Plan that annually reviews the river's ecosystem and its economic value versus allowable recreational and commercial uses.
7. Maintain a shellfish hatchery to continually seed and establish productive areas in the river.
8. Restore historic fish ladders.
9. Continue working on pollution solutions.

Administrative Actions

1. Consider a fee schedule for boat pumpouts.
2. Consider restrictions on the use of "Jet Skis" from sensitive areas in the river and estuary.
3. Consider adopting a local Buffer Zone Protection by-law.

Notes

For the complete Action Plan for Natural Resources, please refer to Chapter 12, Action Plan, Section 12.2 Natural Resources.