CHAPTER 4

ENVIRONMENTAL MANAGEMENT

LAND USE

Introduction

Historical Overview. The overall settlement patterns in Waldoboro were heavily influenced by events that took place several hundred years ago. The following italicized excerpts from "The Medomak Valley Watershed: A Natural Resource Inventory," provide an insight into how these events shaped Waldoboro:

> *"The land use history of the Medomak valley follows a pattern typical of most areas in New England. The first settlement in the watershed was an English trading post established at Pemaquid in 1625. Further settlement was intermittent and light until after the end of the French and Indian War in 1763. From this point on, the population of the valley towns exploded, with peaks occurring in the mid-1800s. By 1754, much of Dutch Neck was completely settled, and by 1790, there were 1,717 people in what is now Waldoboro (Stahl 1956).*
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> *In general, settlement patterns proceeded from coastal islands and ends of peninsulas inland, following rivers and wood supplies. Within a few decades, the landscape was completely transformed from trackless virgin forest to pasture and farmland. By the 1750s the entire coast west of Pemaquid had been stripped of its forests up to 50 miles inland. To the east of Pemaquid, much of the forest land was still untouched. Ten years later, most of the coastal islands and immediate shoreline had been cleared and there were at least twenty sawmills in the lower watershed producing lumber for Portsmouth and Boston markets. Every stream with a decent drop in elevation had a mill, and many had several; for example, Slaigo Brook had four. By the 1820s there were 37 water-powered mills in Waldoboro alone.*
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> *The original lots along the Medomak were laid out with farming in mind. They averaged 25 to 40 rods wide (372 to 660 feet) and 100 acres in size. Most extended from the river to the height of land and often over to the next major stream course. Stahl (1956) describes the pattern of settlement along the Medomak estuary as follows:*
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> > *"At the close of the French and Indian War, the Plantation of Broad Bay was a string of farms, in general one hundred acres each with a 25 rod frontage on the water, reaching from the tip end of Dutch Neck north along the river to about a mile above the lower falls (in Waldoboro Center), and from there, on the eastern bank, running south along the water and around the Bay to the Narrows."*
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> *"Until the 1770s and 1780s, there were very few roads. Most houses were located along the river and connected by foot paths. By 1790 most of the present roads were laid out along the Medomak and there were roads to Union and Warren. Because most farmers considered it a nuisance to have long driveways go through their fields, many farmhouses were moved back from the river and new houses were usually built along roads (Stahl 1956), creating the striking long views that still exist along the Medomak estuary today."*

Physical Setting. Waldoboro, which is comprised of 47,996 acres, or 74.99 square miles, is one of

the largest communities in the State, covering more land area than any other community in Lincoln, Knox, or Sagadahoc Counties. The Town offers a rich diversity of landscapes ranging from a densely developed village center, several smaller village areas, sparsely developed rural areas, a busy thoroughfare (Route 1), heavily forested areas throughout Town, numerous small ponds and extensive coastal shorelines.

Growth and Rural Areas. The Comprehensive Planning and Land Use Regulation Act, Title 30-A MRSA Section 4326, Subsection 3, requires that communities identify at least two basic types of geographic areas:

"1) **Growth areas**, which are those areas suitable for orderly residential, commercial and industrial development forecast over the next 10 years. Each municipality shall:

a) Establish standards for these developments;

b) Establish timely permitting procedures;

c) Ensure that needed public services are available within the growth area; and

d) Prevent inappropriate development in natural hazard areas, including flood plains and areas of high erosion; and

2) **Rural areas**, which are those areas where protection should be provided for agricultural, forest, open space and scenic lands within the municipality. Each municipality shall adopt land use policies and ordinances to discourage incompatible development. These policies and ordinances may include, without limitation: density limits; cluster or special zoning; acquisition of land or development rights; or performance standards."

Waldoboro is primarily rural in nature, but Waldoboro Village would appear to meet the statutory definition of an urban area, in part because of the density of existing development, the presence of residential, commercial and industrial structures and a well defined downtown, and the fact that the Village is served by central water and sewer systems. Route 1 could also be considered a growth area based on the amount of commercial growth that has taken place during the past ten to twenty years. There are several small village areas in the community such as Orffs Corner, Winslows Mills, West Waldoboro and South Waldoboro, but these areas are not served by central water and sewer systems.

The overall analysis of land use patterns contained in Waldoboro's 1967 Comprehensive Plan (page 11-3) is still largely relevant today:

> *"The existing land use in Waldoboro clearly shows the historic development of the community ...The effect of the railroad in Waldoboro, the relocation of Route 1, and the decreased economic activity in boat building have all had their influence on today's townscape. Main Street, once the major shopping area at the head of Medomak Bay, was a flourishing business section. However, with the advent of the automobile and the removal of the main thoroughfare from the business sector of the community, automobile oriented and other business establishments have located outside what was once the business center. The difficult topography in the downtown area, of course, has had an adverse effect.*
>
> *Places like Winslow Mills at one time were flourishing communities. Today they are less vital and what remains is largely a residential settlement serving as bedroom sectors of the*

community and nearby employment markets."

Residential Land Use

Number of Dwellings. Between 1980 and 1990 the total number of housing units increased from 1,641 to 2,039 units, an increase of 398 units or 24%. Much of this growth occurred in scattered locations throughout the community, but enough occurred within the village so that the overall percentage of housing units served by water and/or sewer remained virtually unchanged. In 1980, 23.6% of the Town's housing units were served by the water system; this increased to 26.9% by 1990. In 1980. 22.5% of the housing units were served by public sewer; in 1990 this figure was 22.0%. The comparisons can only be considered rough approximations because the 1980 figures are based on year-round units and the 1990 figures are based on total units.

Composition of Housing Stock. The 1990 housing count of 2,039 housing units included 1,384 single family dwellings (68% of the total), 207 multi-family housing units (10%) and 448 mobile homes (22%). The composition of the housing stock in Lincoln County reflects a greater percentage of single family dwellings (80%), and a smaller percentage of multi-family units (7%) and mobile homes (13%). Waldoboro's 448 mobile homes represented 19% of all mobile homes in the County (2,358 units) in 1990.

Housing Growth Since 1990. According to Town records, permits were issued for 42 single family dwelling units and 52 mobile homes in 1990/91. Beginning in 1992, the Town kept track of structures actually built as well as their locations. Since 1992, there have been at least 204 new structures built in the Town of Waldoboro, as summarized in Table 4-1 below, including a total of 68 single-family dwelling and 107 mobile homes.

Table 4-1

Construction Activity Since 1990

	Single Family Dwellings	Mobile Homes	Commercial	Industrial
PERMITS ISSUED:				
1990	19	30	3	1
1991	23	22	7	-
Total	42	52	10	1
ACTUAL CONSTRUCTION:				
1992	17	8	3	-
1993	11	13	3	-
1994	15	21	4	1
1995	10	30	9	-

1996	15	35	7	2
Total	68	107	26	3

Source: Town of Waldoboro

Residential Development Issues. Residential development issues facing Waldoboro over the next 10 years include the following:

1. **Strip Development.** The 1967 Comprehensive Plan (page 11-4) expressed concerns about strip development which are still valid today:

   "Development in Waldoboro today is urban development. Lots are being sold on existing streets; stores are being established on street corners and at the junction of roads, and very little land is being developed between and away from roads. We have strip development rather than sectional development in the community. While on one hand this is utilizing existing streets, it defeats the purpose of using existing roads as traffic carriers and at the same time it makes eventual provision of utilities, both sewer and water, extremely costly. Waldoboro's future development should be one of greater concentration and less dispersal. ...dispersal along existing roads has taken place to the point where this trend must be reversed."

   Since at least 1992, only a small number of structures built in Waldoboro (17, or 11%) have been located in Waldoboro Village. The rest have been built in scattered locations throughout the community including 19 along Route 1, eight in the Winslows Mills area, three in West Waldoboro, 21 on Dutch Neck, 16 in South Waldoboro, and 20 in North Waldoboro. Waldoboro might be able to change this trend by adopting graduated lot sizes (smaller lots close to Waldoboro village, larger lots at the far edges of Town).

2. **Disincentives for Village or Other Concentrated Growth.** Waldoboro's land use policies have not provided any incentives for development to occur within the village or close to it. In fact, these policies have worked to discourage higher density development and may in fact contribute to strip development. In Waldoboro Village, very few of the lots within about 1,000 feet of the intersection of Main and Jefferson Streets meet the requirements of the Town's Minimum Lot Size Ordinance. Very few lots have the required 150 feet of frontage, and many of them are less than 20,000 square feet in size. The Town's Minimum Lot Size Ordinance applies a standard that did not exist when the village first developed. Given that the village is served by a central water and sewer system, a lot size requirement of about 5,000 square feet, plus 50 feet of frontage and a reduction in side lot line requirements, would encourage the type and density of development already there.

3. **Individual Mobile Homes/Single-Wide Modulars**. Waldoboro's 1987 Comprehensive Plan update (page 18) addressed the issue of lower priced rentals and mobile homes:
   "Waldoboro has an elderly housing project located in the Sprout Block which opened in 1983. This partially resolves the need for lower priced rentals expressed in the 1976 Comprehensive Plan update. Concern for the increase in mobile homes and parks in Waldoboro was also stressed in the 1976 (update). The Public Opinion Survey results indicate that approximately 90% of those responding feel that standards should be placed on mobile homes."

   Waldoboro places no restrictions on the location or appearance of mobile homes and single-

wide modular units. Since 1992, the majority of dwelling units located in Waldoboro (107 out of 175 units, or 61%) have been mobile homes. Mobile homes offer one of the few low-cost housing alternatives for many people, and thus fulfill a valuable service. On the down side, mobile homes often deteriorate faster than conventional housing, they usually depreciate in value, they seldom pay their way in taxes, and they can depreciate the value of adjacent homes. Waldoboro is now home to almost 20% of the County's total stock of mobile homes. There are no areas which the Town has established as being exclusively for single-family dwellings. Other communities have designated certain areas for the location of mobile homes/single wide modulars. Similar action by Waldoboro would ensure that these units could continue to locate in the community without having a Town-wide impact on property values. Such action is permitted by State Law (Title 30-A MRSA Section 4358, Subsection 2) even if a community does not have a zoning ordinance. The Town could also enact standards regulating the appearance of mobile homes to ensure that they more closely resemble site built homes.

4. **Mobile Home Parks.** Waldoboro has not placed any limits on the development of mobile home parks. There are four mobile home parks in Waldoboro including Medomak Trailer Park (45 units) located on 8.7 acres on Mill Street next to Shop 'N' Save, DePatsy Mobile Home Park (42 units), located on 17.1 acres just south of Waldoboro Village on Route 220/Friendship Road; Brookside Mobile Home Court (20 units), located on 22 acres several miles south of Waldoboro Village on route 220/Friendship Road; and Hathaway Mobile Home Park (7) units located on 3.4 acres on Depot Street just north of the Village.

   As of this writing, there are at least 555 mobile homes in Waldoboro 448 from the 1990 Census, plus 107 located in Town since 1992) not counting units placed in the community during 1990 and 1991 (52 permits were issued during that time). Based on this approximate count, there are 114 units, or 21% of the total that are located in mobile home parks; the rest are on individual lots.

   Currently, a mobile home park not on a central sewer system may be located anywhere in the community, and, by State law, a mobile home park may develop at four (4) times the density permitted by the Town's Minimum Lot Size Ordinance. State law (Title 30-A MRSA Section 4358, Subsection 3A) prohibits municipalities from imposing a lot size greater than 20,000 square feet on a mobile home park when the park is to be served by on-site, subsurface wastewater disposal. In effect, site built homes outside Waldoboro Village must be located on lots which are at least 80,000 square feet in size (approximately 2 acres), but a lot in a nearby mobile home park only has to be 20,000 square feet. This freedom to develop at relatively high densities is balanced by a provision in the law which allows a community to limit mobile home parks to certain areas. Under this law, Waldoboro could require that mobile home parks be located close to the village so that municipal services could be more easily provided and to make it fiscally possible to extend municipal sewers to the park in the event of a failure of the on-site system(s).

5. **Exclusive Residential Areas.** There are no areas of the community which are designated by the Town as being primarily residential in nature and which consist primarily of site built homes. Waldoboro could create such areas through zoning to provide homeowners with the assurance that their property values would not be undermined by inappropriate uses being located near them. Such action by the Town might have the added benefit of increasing property values in these area.

Commercial Land Use

There are approximately 111 commercial businesses in Waldoboro including 52 retail businesses and 59 service businesses. These businesses include, among others, nine restaurants, 11 auto repair businesses, two doctors' offices, two dentists, two chiropractors, two attorneys' offices, six office buildings, a veterinarian, two convenience stores, three hardware stores, a pharmacy, three banks, two insurance offices, two auto parts stores, a barber, two beauty shops, a bakery, four gas stations, a grocery store, a car dealer, and three realtors.

The majority of the commercial properties in Town are located either in Waldoboro Village or along Route 1, particularly in the vicinity of its intersection with Route 32.

Commercial Development Issues. Commercial development issues include the following:

1. **Waldoboro Village**. The Town may be discouraging businesses from locating in the Downtown. The Town's Land Use Terms, Definitions and Performance Standards Ordinance requires that new businesses provide specific amounts of off-street parking. While there is a public need to ensure that there is sufficient off-street parking, the Town's parking standards discourage new businesses, particularly small businesses that cannot afford to purchase additional land for parking. Waldoboro could consider revising the parking requirements, or eliminating them altogether for small businesses or for businesses in pre-existing buildings on lots below a certain size (for example, 5,000 square feet).

2. **Route 1.** Route 1 is gradually being transformed into a neon highway. There are approximately 54 businesses located along Route 1, including at least 10 that have located along the highway since 1992. Waldoboro has done very little to ensure that these businesses are well landscaped and attractive, and there has been little done in the way of access management (limits on driveway entrances and exists so as to preserve the traffic carrying capacity of Route 1). While it may seem that businesses have saturated the Route 1 corridor, there are numerous parcels yet to be developed, and development pressures seem unending. The trend in commercial roadside development statewide includes "big-box" retailers, the growth of national franchise outlets, large parking lots, individual highway entrances, unattractive signs and a great deal of outdoor lighting. Waldoboro faces an almost inevitable growth of this type of development, and ultimately the conversion of Route 1 to an unattractive, densely developed, unsafe commercial strip, unless fairly strong measures are implemented. Mere adjustments in the Town's ordinances may not make much of a difference.

   Town actions to positively affect Route 1 could include one or more of the following for new developments and for the redevelopment of existing business properties:

   a) **zoning** - placing only a portion of Route 1 in a commercial district, while prohibiting commercial development along other portions of the highway (limiting commercial development along Route 1 may encourage it in other areas such as Waldoboro Village);

   b) **landscaped buffers** - requiring a substantial landscaped buffer (such as 50 feet) along Route 1;

   c) **dimensional requirements** - increasing the frontage requirement along Route 1 (for example, to 300 or 400 feet), as well as setbacks (for example, 100 feet), and

prohibiting parking areas within the first 50 or 100 feet of the road)

d) **driveway limits** - limiting driveways to one per lot of record, with provisions for a second if the frontage is large enough (for example, 500 feet);

e) **development incentives** - decreasing the frontage requirement when adjacent businesses share a driveway, exempting businesses from the frontage requirement when they are part of a development that shares driveways and parking areas (for example, a mini-mall developed perpendicular to the road).

Industrial/Manufacturing Land Use

Industrial land uses are located throughout the community, but are most heavily concentrated in the vicinity of Waldoboro Village and Winslows Mills. The Town's industries include manufacturers of science kits for schools, screen doors, light bulb filaments, a sawmill, a felt processor, a seafood processor, a seaweed plant, a warehouse, and two boat building operations.

Industrial development does not pose the same challenges as commercial growth along Route 1. For the most part, Waldoboro's industries are situated close to the village. Without zoning, however, there is always the possibility that an industry can be located adjacent to virtually any residential property. To minimize future problems caused by inappropriately located industrial development, Waldoboro could zone certain areas for industrial development, and/or require that they be connected to a central water and sewer system.

Publicly Owned Land

The major Town-owned parcels of land include nine properties totalling 224.3 acres plus three school properties totalling 99.3 acres, for a total of 323.6 acres. The largest parcel is Medomak Valley High School (87 acres), owned by School Administrative District #40. The Town-owned land includes parcels which relate strictly to municipal services (transfer station, Town garage, municipal building), properties which support the cultural life of the community (such as Friendship Street School), and properties which either provide recreational opportunities and/or support those who make their livelihood from the sea (athletic field, tennis court, public landing, marine park).

Table 4-2

Summary of Public Land

Parcel	Tax Map/Lot	Acreage
Town Owned Land		
Municipal Buildings		
1. Municipal Building	U5/11A	7.60
2. Public Works Garage	R17/2	56.00
3. Transfer Station	R17/65	70.00

Commercial/Industrial Facilities		
4. Friendship Street School	U3/13	2.30
Recreational Facilities: Parks & Playgrounds		
5. Marine Park	R1/79	20.00
6. Medomak River Rest Area	U10/11	.90
7. Memorial Park	U11/17	.50
8. Philbrook Athletic Field	U5/30	4.20
9. Public Landing	U11/19	1.88
10. Town Tennis Court	U4/62A	.80
11. Town Forest	R4/22	63.50
12. Community Recreation Land	U10/3A	21.37
13. Kahn Parking Facility	U4/25	.41
SAD 40 Facilities		
14. Miller Grade School	U10/9	10.00
15. A.D. Gray Jr. High	U4/63	1.65
16. Medomak Valley High School	R14/34	87.00
Waldoboro Utility District		
	U2/8A	.02
	U4/18	1.60
	U10/15	.21

Source: Town of Waldoboro

Agricultural Land

While farming at one time dominated the landscape of Waldoboro, there is very little left today to indicate the importance of agriculture to the community. While there are a number of small farms, as well as 27 parcels which have been classified as farmland for tax purposes, there are two commercial farms in Waldoboro including a dairy farm on Castner Road, and an egg farm on Goshen Road.

Open Space Land

Based on Town records, there are 68 parcels of land, totalling approximately 4,096 acres, or roughly 9% of the Town, that have placed by their owners in one of three types of open space categories for tax purposes. These include 27 parcels (1,981 acres) which are classified as farmland, three parcels (139 acres) which are classified as open space, and 38 parcels (1,976 acres) that have been classified

as tree growth (754 acres of softwood, 840 acres of mixed woods, and 382 acres of hardwood). The majority of these parcels are located in the northwestern portion of the community, and in the area south of Route 1 and east of Waldoboro Village (southeast quadrant of town). These land areas should not be considered permanent open space because land owners can pay a tax penalty and convert the land to other uses. However, as a general rule, most landowners maintain these classifications for long periods of time and there is little change in the overall pattern from year to year.

In addition to the above, there are three parcels of land held by land trusts or similar organizations: a 57-acre parcel of land at the end of Reef Road held by the Medomak Valley Land Trust; a 20-acre parcel on Friendship Road held by Mid-Coast Audubon; and an 11-acre parcel on Dutch Neck Road held by Pemaquid Watershed Association.

The open, rural landscape which predominates south of the Village is reflective of the Town's farming heritage. The long, narrow, rectangular lots, originally laid out for farming purposes, now serve to keep the land rural and sparsely developed. This pattern of lot divisions makes it unlikely that large parcels can be assembled for development purposes. Instead, the pattern virtually assures the preservation of a great deal of open space, and a sparse development pattern along the Towns' roads.

Historic and Archaeological Resources

The Maine Historic Preservation Commission (MHPC) is Maine's central repository for archaeological information and for sites listed in the National Register of Historic Places.

Prehistoric Archaeological Resources. Prehistoric archaeological resources are those associated with Indian archaeology and generally date prior to the 1600s. MHPC reports that there are 23 known sites in Waldoboro, most of which consist of shell heaps and all except one of which is located in the coastal zone. Eight of these sites are possibly eligible for listing in the National Register of historic Places. One site on Jones Neck is listed in the National Register. MHPC also reports that a coastal zone site location survey has been completed, but that the Medomak River valley above head-tide needs to be surveyed. MHPC has identified the shoreland areas of Medomak Pond and the Medomak River as areas of archaeological resource potential.

Historic Archaeological Resources. Historic archaeological resources are those associated with the earliest European settlers, generally during the 1600s. Based on information obtained from MHPC, no professional survey for historic archaeological sites has been conducted to date in Waldoboro. Future field work could focus on sites relating to the earliest European settlement of the Town, beginning in the 1730s.

Historic Resources. Historic resources such as old homes, graveyards, mill sites and old stone walls help establish community character and make each community unique. The National Register of Historic Places, administered by the National Park Service, is a listing of those buildings, districts, structures, objects and sites judged worthy of preservation for their historical, cultural, or archaeological value. Based on information obtained from MHPC, Waldoboro has six sites which are listed in the National Register of Historic Places:

1. Old German Church and Cemetery, Bremen Road
2. The former U.S. Custom House and Post Office, Main Street (now the Waldoboro Public Library)
3. Waldoboro Town Pound, Main Street

4. Godfrey Ludwig House, Winslows Mills Road
5. Waldo Theatre, Main Street
6. Hall's Funeral Home, Main Street

The MHPC suggests that a comprehensive survey of Waldoboro's historic, above-ground resources should be conducted in order to identify other properties which may be eligible for nomination to the National Register of Historic Places.

Land Use Ordinances

Land use ordinances serve to provide a balance between public interests and private property rights. The courts in Maine and the United States have consistently confirmed that some rights of the community come before some private property rights. However, the courts have also said that land use regulations must be reasonable and must be applied fairly and impartially. The Town of Waldoboro does not have a zoning ordinance, but it does have several other ordinances that regulate land use activity:

Site Plan Review and Subdivision Ordinance. Waldoboro's Site Plan Review and Subdivision Ordinance applies to all subdivisions, new buildings and structures, and new uses of land except single-family dwellings, two-family dwellings, the conversion of single-family to two-family dwellings, forest management activities, and certain commercial agricultural activities. The Ordinance contains application requirements, as well as review criteria which are essentially the same as those contained in the Subdivision Law, Title 30-A MRSA Sections 4401 through 4407. The Ordinance also contains performance guarantees to ensure the proper construction of required improvements.

Land Use Terms, Definitions and Performance Standards Ordinance. This Ordinance can best be described as a partial zoning or land use ordinance with many of the pieces missing. Section l of the Ordinance contains definitions which are to be applied to all of the ordinances of the Town of Waldoboro. The definitions are similar to those typically found in a zoning or land use ordinance. Section II contains General Performance Standards, and Section III contains Specific Performance Standards - Activities and land Uses. The Ordinance also contains an index.

Missing pieces include general provisions, such as purpose, applicability and effective date, an appeal procedure, and administration and enforcement provisions. The standards appear to exist by themselves, and are not part of any permit internal application process; however, other ordinances refer to these standards There are no provisions dealing with violations of the Ordinance. Finally, there are no land use districts that would set forth permitted uses and dimensional requirements.

Minimum Lot Size Ordinance. The Town's Minimum Lot Size Ordinance is an important land use ordinance which complements the Land Use Terms, Definitions and Performance Standards Ordinance. Key provisions include the following:

> **Lot Size and Frontage**. The Town's Minimum Lot Size Ordinance establishes a lot size requirement of 20,000 square feet and 150 feet of frontage for lots served by the municipal sewerage treatment facility. Lots which are not located on the sewerage treatment system must have a minimum of 80,000 square feet and 200 feet of frontage. In both areas, a second dwelling unit can be located on the required lot, provided that any additional units beyond two must each meet the required minimum lot size.
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> The minimum lot size requirements for motels, hotels, inns, nursing homes, congregate

housing and dormitories is 40,000 square feet (80,000 square feet if not on the municipal sewerage system) plus 4,000 square feet for each rental unit.

Setbacks. The Ordinance also requires a front lot line setback of 50 feet, and a 30-foot setback from side lot lines. No satellite receiving dish may be located within a required setback, driveways may not be located within 10 feet of a side or rear lot line, and no parking area may be located within 10 feet of any lot line. As written, the parking lot setback requirement would appear to preclude the use of inter-connected parking lots (interconnected parking lots can be used to reduce driveway entrances/exits onto a major thoroughfare).

Back lots. The Ordinance exempts back lots from the front lot line requirement, but does require that such lots have at least one lot line equal to the front lot line of the lot over which the driveway passes.

Standards. The Ordinance requires that all new buildings and structures, and their expansion, enlargement and reconstruction, as well as land use changes, be subject to the land use standards contained in the Town of Waldoboro Land Use Terms, Definitions and Performance Standards Ordinance except for lots on which will be located no more than two residential units (this is a provision that should be included in the Land Use Terms, Definitions and Performance Standards Ordinance).

Building Permit Ordinance. The Town's building permit ordinance requires a permit for all structures constructed, reconstructed, enlarged or relocated in the Town of Waldoboro, with exemptions for maintenance and repair and accessory structures of less than 100 square feet outside the shoreland area. There is no specific reference to the Land Use Terms, Definitions and Performance Standards Ordinance, but there is a provision in Section 8 which states that the Code Enforcement Officer shall issue said certificate after proper examination shows that all work performed is in compliance with the provisions of all State and local codes.

Sign Ordinance. The Town's Sign Ordinance requires a permit for any sign, and sets standards regulating the number and types of signs that may be permitted as well as their size.

Shoreland Zoning Ordinance. The Town of Waldoboro has a Shoreland Zoning Ordinance that is based on the State's model shoreland zoning ordinance. The Ordinance divides the 150-foot shoreland area into one of six districts including the Resource Protection District, the Limited Residential District, the Limited Commercial District, the General Development District, the Stream Protection District and the Water Dependent Commercial Maritime Activities District.

Floodplain Management Ordinance. The Town's Floodplain Management Ordinance, which is based on a model prepared by the Federal Emergency Management Agency, regulates land use activities in the Town's designated flood hazard zones. The Town's adoption, administration and enforcement of this Ordinance enables land owners in flood prone areas to purchase federally subsidized flood insurance for their dwellings or businesses.

Hazardous Materials and Waste Ordinance. The Town's Hazardous Materials and Waste Ordinance regulates the installation of fuel tanks and other hazardous materials.

NATURAL RESOURCES

(Note: portions of the following information on natural resources are taken from "The Medomak Valley Watershed: A Natural Resource Inventory." Material taken from that report is identified by italics.

Geologic Overview

About 700 million years ago, a long, narrow belt of active volcanoes extended from present-day Newfoundland to Alabama and included parts of coastal Maine. As the volcanic mountains eroded, an apron of sediments was deposited at their base. These sediments were then compressed into a thick belt of metamorphic rock formations, known as the Casco Bay Group, that extends from Saco northeastward to the vicinity of Belfast (Bennet 1988).

Around 300 million years ago, in the early Devonian period, another major period of upheaval and volcanic activity occurred that dramatically altered the face of Maine. Beneath the surface, the sedimentary rocks of the Casco Bay Group were recrystallized (metamorphosed) into harder schists, gneisses, and quartzites. Deeply depressed sediments began to melt, forming larger quantities of magma that intruded under great pressure into the metamorphic rocks, squeezing into joints, cracks and crevices. As the magma gradually cooled and crystallized, huge masses of granite were formed, along with relatively small amounts of pegmatite rock, with its larger crystals of quartz, feldspar, and gem minerals such as garnets and tourmaline (Bennett 1988).

These huge plutons of granite rock, including a large mass known as the Waldoboro Pluton Complex which underlies much of the Medomak watershed, were then located several miles beneath the surface (Sidle 1991). As millions of years passed, rock and overburden were eroded and carved by rivers, revealing the granitic bedrock that is so ubiquitous in Maine today (Bennett 1988).

While general landforms can be attributed to bedrock geology, the landscape that we see today has been sculpted by the series of glaciers that have advanced across Maine every 100,000 years or so for the past 2.5 million years. The "drowned" coastline of Muscongus Bay and the marine clays and veneer of gravelly till that carpet the land are the handiwork of the last glacier, which covered all of Maine with a mile of ice about 25,000 years ago. By 21,000 years ago, the edge of the ice extended out to the present continental shelf at Georges bank, which was dry land at the time because such vast quantities of the earth's water were tied up as ice. By 13,000 years ago, the glacier had receded to a position north of Waldoboro. Because the weight of the glacier had depressed the earth's crust nearly 400 feet below its present elevation, lowland areas were flooded by marine waters from the gulf of Maine even as the earth's crust began to rebound (Kelley 1987; Kendall 1987).

Meltwater from the glacier deposited stratified sands and gravels into glacial landforms such as moraines, eskers, and outwash plains. In the southern half of the watershed, till was deposited as a series of washboard moraines. Washboard moraines are clusters of regularly spaced, crescent-shaped ridges that range from five to 15 feet in height. These moraines, which appear to march across the landscape, are readily visible from the air. They are responsible for the rough hummocky terrain that is typical in the lower watershed. The most notable glacial deposit in the Medomak watershed is an old glacial lake delta that extends form the settlement of Globe to Medomak Pond (Smith 1976; Smith and Anderson 1975). This delta provides material for the extensive Globe gravel pits.

At lower elevations, clays and silts were transported to the ocean, where they settled to form

extensive deposits of glaciomarine clay known as the Presumpscot formation. As the ice melted, the land began top rebound. By about 12,000 years ago, most of coastal Maine had emerged from the sea. Today, the blue-gray clays of the Presumpscot Formation are found at elevations as high as 300 feet above sea level. Even so, the land is still depressed about a hundred feet below its pre-glacial elevation.

Water Resources

The Medomak River and Estuary

T*he Medomak River and estuary are located in midcoastal Maine, between the St. George River valley to the east and the valleys of the Damariscotta and Pemaquid Rivers to the west. As the crow flies, the center of the Medomak watershed is located about 50 miles from both Portland and Mount Desert Island. From its headwaters in Liberty, Appleton and Searsmont, the Medomak flows in a southerly direction for just over thirty miles before reaching the head of tide in the Town of Waldoboro. The estuary, which includes water that is measurably diluted by salt water, extends for another nine miles and eventually merges with the more saline waters of Muscongus Bay. Together, the tributaries that feed into the river, its estuary and western Muscongus Bay drain portions of 13 towns including Appleton, Bremen, Bristol, Cushing, Friendship, Jefferson, Liberty, Nobleboro, Searsmont, Union, Waldoboro, Warren and Washington. With its 14 ponds and lakes, 65 coastal islands and dry ledges, the Medomak River watershed encompasses about 90,000 acres.*

Approximately 71% of the Town of Waldoboro, or 33,033 acres, lies within the Medomak River watershed. The Town of Waldoboro thus accounts for about 37% of the watershed.

The Medomak River meanders through a broad valley, falling gently at the rate of about 20 feet per mile. The width of the watershed varies from about seven miles at its northern boundary to only about 2.6 miles near Orff's corner.

The headwaters of the Medomak include Medomak Stream, Fish Brook, Pettingill Stream, and their tributaries. These are joined by Little Medomak Brook, which flows out of Washington Pond, the largest lake in the watershed. Below its confluence with the Little Medomak, the river widens and meanders across an old glacial lake delta that surrounds Medomak Pond.

From Medomak Pond to Winslows Mills, the river is characterized by long winding stretches of deadwater which are interrupted by short riffles and three rapids. Below Winslows Mills, the river alternates between riffles and deep pools and then slows to deadwater for the last two miles before the rapids and falls between Route 1 and tidewater. The average width of the river in this section is 75 feet .

From (Winslows Mills), the river winds its way to Waldoboro (village), where it cascades over a series of falls and ledges, (falling) 15 feet over a distance of about 100 feet. The average flow near the river's mouth is low, averaging less than 100 cubic feet per second, and it varies with the season. During winter thaws and the spring freshet, more than ten times the average volume of water courses through the river channel, and during the summer months, volumes of less than 50 cubic feet per second are typical. There are 18 dams with visible remains left on the Medomak and its tributaries. All have been breached.

The Medomak River, and to a lesser extent the Goose River, which forms the boundary between Waldoboro and Friendship, are the major sources of freshwater to the estuary. The estuarine/marine boundary for the Medomak is delineated by a line that extends from the north end of Hungry Island to the southern end of Jones Neck and across to Keene Neck at the north end of

Hockomock Channel. Most of the estuary is well mixed, with low salinities only at the head of tide.

Marine Economy

Fishing and clamming are important to Waldoboro's economy. Equally important is the extent to which the Town has been active in managing the quality of the Medomak River and estuary, as well as fish and clam populations. The following is a brief summary of these efforts since 1990.

1990. The Department of Marine Resources closed 70% of the Town's clam flats because of contamination by sewage. The Selectmen re-activated the Conservation Commission and charged it with the responsibilities of monitoring and improving the quality of the Medomak River, including identifying sources of pollution and working with appropriate agencies to eliminate pollution sources. The Board of Selectmen appropriated funds for laboratory testing equipment, and a water quality testing laboratory was established in the old Friendship Street School. The Conservation Commission identified several pollution sources including leakage from the sanitary sewer into the storm sewer system. The Town applied for and received several grants to help address pollution problems. Initiatives of the Waldoboro Alewife Project including stocking 750 alewives into Kaler pond and 300 into Storer Pond, and research into hatching and releasing shad into the Medomak River.

1991. The Conservation Commission established baseline information for the continued efforts to monitor the quality of the River, and increased bi-weekly tests from 12 sites to over 40 sites on the River. The Commission worked with the Code Enforcement Officer to conduct a septic system survey and correct a number of malfunctioning systems. The Commission identified three major sources of pollution including a defective section of the municipal sewer on Main Street, and discharges from two mobile home parks. The system at one of the parks was corrected, and an engineering study was prepared for the second park. A number of high school students participated in water quality monitoring efforts. In terms of fisheries, 450 alewives were stocked into Kaler Pond. With donations from several businesses and funds from the Lloyd Davis Fish Trust, the Town's fish agents purchased a small hatchery system, as well as 300,000 fertilized shad eggs. While the eggs hatched and were transferred to rearing ponds, the fry did not survive.

1992. The Conservation Commission continued its water quality monitoring efforts as well as its septic system survey and identified several faulty or non-existent systems. The mobile home park malfunctions were corrected. The Commission worked with the Department of Marine Resources and successfully persuaded officials to conditionally open the remaining clam flats. The Town enacted a Shellfish Ordinance and hired a code enforcement officer to enforce it.

1993. The Sewer District completed the replacement of the faulty downtown sewer lines. The Conservation Commission continued its water quality monitoring program in cooperation with High School students. The Commission continued its septic system survey with the Code Enforcement Officer, and the Town continued to administer a program of grants and loans to assist homeowners who were financially eligible for repair or replacement of their systems. The Maine Legislature reclassified the Medomak River above the Wagner Bridge to "Class A." The Shellfish Committee issued 208 commercial licenses, including 173 resident licenses and 35 non-resident licenses. The Committee also issued 246 resident and 23 non-resident recreational licenses.

1994. The Conservation Commission continued its water quality monitoring efforts. The

Commission applied for and received a Partners-In-Monitoring to purchase equipment and supplies to enable Medomak Valley High School students to continue the work of water quality testing on the Medomak. The Americorps Program enabled the Commission to hire a person to conduct a shoreline survey. The Code Enforcement Officer continued to seek out and require correction of faulty septic systems. The Shellfish Conservation Committee issued 248 commercial licenses including 225 resident and 23 non-resident licenses. The Committee also issued 258 resident and 12 non-resident recreational licenses. The Committee seeded the Stahls Bar area which was subsequently closed by the Selectmen. The Coast Guard marked the channel for boaters.

1995. By a vote of 717 to 237, the Town voted to maintain the Shellfish Ordinance with a number of changes. The Shellfish Conservation Committee planted approximately one million seed clams at Stahls Bar. The Committee also acquired a "tidal upweller" from Brunswick, which was repaired and floated down river off "Arthur's Cove" to start the process of growing an additional four million seeds.

The Shellfish Industry

The Waldoboro Shellfish Committee was formed in 1992 to provide oversight of the shellfish industry. The Committee drafted a Shellfish Ordinance which was enacted that same year. The Ordinance requires clammers to hold a local license to dig clams and offers most (90%) licenses to Waldoboro residents. Waldoboro and Damariscotta were the last two towns in the midcoast region to have such an ordinance. During the first year, 180 licenses were sold at a cost of $35 each. In 1993, the Committee purchased a boat and motor and hired a shellfish warden to enforce the ordinance 32 hours per week. License fees were increased to $50. In 1994, a million seed clams were purchased from Beal's hatchery in Machias. These were planted by volunteers on Stahl's Bar under nets, and the area was closed to digging. In 1995, 1.5 million seed clams were purchased and placed further seaward. Native clams are found in seeded areas, perhaps because of the nets. Native clams can be distinguished from planted ones by the shells. Seed clams grow extremely fast.

In 1995, the Committee issued 225 local clamming licenses (the largest number of any town in the State), and 23 non-resident licenses (10%, as required by State law). The Committee estimates that there are between 60 and 70 people who are serious diggers. There are a total of about 2,600 shellfish licenses in the State.

The Town's $50 fee for a license is among the lowest in the State (the non-resident license costs $100). A recreational clamming license is $1, which is considerably less than the fee of $10 to $20 charged in other communities. The Committee estimates that clamming is a $2.5-3.5 million industry in Waldoboro, and is the Town's top employer. In the future, the Committee hopes to dig its own seed clams, which will be moved to a closed area to grow to market size. The Committee also undertakes a complete shoreline survey every five years to check streams for human coliform bacteria.

The State requires that flats be closed to clamming any time there has been more than one inch of rain during a 24-hour period (storms drains go directly to the river, rather than the sewage treatment plant). The State also requires that the area within one mile of the outfall of the treatment plant be permanently closed to clam harvesting except depuration harvesting, in which clams are taken to a depuration plant.

Medomak River Estuary- Economic Importance

The Medomak River and its estuary is perhaps the most important economic resource of the community, but the estuary is currently underutilized as a community resource. It has great potential for recreation and aquaculture if water quality can be maintained. Mussels and oysters could be grown in the deeper water, as in Damariscotta. If the sewage treatment plant is moved away from the river, the clam flats immediately below it could be opened to harvesting; they are now required to be closed for a certain number of feet, in case of malfunction. However, moving the treatment plant may not necessarily result in the opening of all presently closed clam flats. Osram Sylvania still discharges to the river, and non-point source pollution can result in the closure of clam flats.

Currently, there is no centralized marketing effort. There is a large market for clams in distant locations (e.g. clams cost about $300/bushel in Chicago) if the transportation problem can be solved.

The Shellfish Committee wants to encourage recreational use of the River. In 1993, new navigational buoys were placed in the upper estuary for the first time. The Coast Guard sets the buoys in June and removes them in November because of ice. Committee members feel that Waldoboro may need a harbormaster if boating increases. The Shellfish Committee has obtained a design and cost estimate ($14,858) from Prock Marine for a ramp and float at the village Town landing for use by recreational boaters as well as clammers.

The river offers the potential for aquaculture and possibly sightseeing tours. Recreational boaters could use local restaurants and bed and breakfast establishments. The scenic qualities of the river could attract business offices to locations within the village.

Within the past eight years, catching elvers (baby eels) has grown into a large seasonal industry. In the past, fishermen have attached nets to the Town landing bulkhead and Storer's to catch the elvers, and this has obstructed navigation and other uses of the new bulkhead. The large number of elver fishermen, fishing day and night for three months, impacts the congested village and residential areas near the head of tide in several ways: increased traffic flow, parking problems, erosion of river banks, and noise in a quiet residential area. Additionally, the environmental impact on the river itself, its fish and wildlife, remains to be seen. The Town should have some degree of control over the fishery.

Ponds

There are five great ponds in Waldoboro lying totally within the corporate limits of the Town (Kalers pond, Little Medomak (Storers) Pond, Medomak Pond, Peters (Gross) Pond, and Sidensparker Pond) and four which lie partially in Waldoboro (Duckpuddle Pond, Havener Pond, Pemaquid Pond, and Tobias Pond). There are a number of ponds less than 10 acres in size, one of which is Jones Neck Ice Pond (5 acres).

The most striking feature of the ponds is the lack of development along their shorelines. This can be attributed in part to large stretches of swampy and marshy shore along many ponds. Much of the shoreline of Medomak Pond, for example, is active floodplain. It is also remarkable (that only Medomak Pond has) public access. (The lack of access) may contribute to (the) relatively pristine condition (of the remaining ponds). (Table 4-3 contains a summary of major characteristics of Waldoboro's nine great ponds).

TABLE 4-3

MAJOR CHARACTERISTICS OF LAKES AND PONDS IN WALDOBORO

Pond	Acreage	Depth (max.) (feet)	Shoreline Feet	Shore Development # of Structures	Shore Development Access	Acres Drainage Area in Waldoboro	% Drainage Area in Waldoboro
Ponds Located Totally Within Waldoboro							
Kalers Pond	87	12	6864	4 (in cluster)	No R.O.W.	365	100
Little Medomak (Storers Pond)	75	26	7392	1 (topo)	No R.O.W.	610	81.7
Medomak Pond	237	25	15,000+/-	6 (topo)	Boat launch R.O.W.	1734	5.7
Peter's (Gross) Pond	12	59	3,000+/-	none (1994)	No R.O.W.	?	?
Sidensparker Pond						936	17.3
Ponds Located Partially Within Waldoboro							
Duckpuddle Pond	242	23				3575	71.8
Havener Pond	98	12	8,400+/-	2 (1993)	No R.O.W.	383	41
Pemaquid Pond	1440.6	61				420	7
Tobias Pond						22	12.1

Source: The Medomak River Watershed, a Natural Resource Inventory, Medomak Valley Land Trust, 1994, and Department of Environmental Protection.

Water Quality

One of the most important natural resources in the watershed is the water in the Medomak River itself. Water from the river has been used to drive mills, receive industrial waste, dilute sewage, cool machinery, process food and water livestock. Sawmill waste, dams, and nutrient-laden runoff from farms undoubtedly had a major impact on water quality in the watershed in the last century. Although there are still many problem areas, the water quality of the river has gradually improved in the last several decades. The last major industries to discharge effluent into the river above the head of tide were the Medomak Canning Company at Winslows Mills, a fish rearing station on Fish Brook, and several sawmills. By the early 1970s, most of these industries had closed or were

connected to Waldoboro's sewage treatment plant.

The upper part of the Medomak River, from its headwaters in Liberty, Appleton and Searsmont to the Wagner Bridge in Waldoboro, is presently rated as a class "A" river stretch. The lower river, from Wagner Bridge to the head of tide, is class B (note: these classifications reflect water quality attainment goals and allowed uses - not current necessarily current water quality).

Although there are currently no industrial sources of pollution in the upper river, the Medomak is still considered a major source of bacterial pollution to the estuary, due primarily to malfunctioning septic systems. For the last several decades, contamination of clams with coliform has been a problem in the Medomak estuary. Recent investigations (Scully and Dumont 1990) indicate that malfunctioning septic systems are responsible for high bacterial pollution levels all along the estuary, causing the closure of many shellfish flats. The Waldoboro Conservation Commission has undertaken an aggressive program to identify and repair all malfunctioning septic systems and faulty sewer lines in the Town. To date, many of the serious problem areas have been identified and remedied and plans are underway to inspect the remaining systems. The Conservation Commission is exploring the idea of implementing a watershed-wide water quality monitoring program.

The Department of Environmental Protection has compiled water quality information on only two of Waldoboro's great ponds (Duckpuddle Pond and Pemaquid Pond). The Department has assigned a "moderate/sensitive" water quality classification to all of the Town's great ponds, including Duckpuddle Pond and Pemaquid Pond. Moderate/sensitive lakes and ponds have clarity, and do not have summer algae blooms. Algae levels are moderate, as are phosphorus concentrations. These water bodies have a high potential for developing algae blooms because of significant summertime depletion of dissolved oxygen levels in the hypolimnion (bottom portion of lake) and/or large seasonal fluctuations in algae and nutrient levels.

According to the Department's water quality data, Duckpuddle Pond shows oxygen depletion in the bottom waters to levels which are considered to be high risk and has developed, or will develop, a significant phosphorus internal recycling problem. Duckpuddle Pond is highly colored with natural dissolved organic compounds, and algal productivity may be somewhat limited as a result. Pemaquid Pond shows dissolved oxygen depletion in the bottom waters, to levels which are considered as having a severe reduction in coldwater fish habitat, and to levels which are considered to be high risk for the development of a significant phosphorus recycling problem, if the problem doesn't already exist. The Department's data report also notes that the Pond has moderate algal production; water quality in Pemaquid Pond appears to be stable, and any annual or seasonal fluctuations are probably natural.

Groundwater

According to the 1990 Census, of the 2,039 housing units in the community, only about 550 (27%) are on the public water system. The remaining 1,489 rely on other sources including dug wells and drilled wells. The sources of water for private wells includes sand and gravel aquifers and bedrock aquifers.

Sand and gravel aquifers are excellent resources for public and private water supplies and, of course, for sand and gravel. By definition, sand and gravel aquifers are highly permeable and so are vulnerable to contamination of their valuable water reserves from pollutants leaching into the ground. Generally, all such aquifers should be protected from contamination so that they can be used as public water supplies in case existing supplies become polluted or exhausted. The Town's interest in protecting its ground water resources is best served by restricting land uses over aquifers to those that do not have the potential to contaminate the ground.

The Maine Geological Survey has identified three significant sand and gravel aquifers in Waldoboro. Each of these aquifers consists of surficial deposits with moderate to good potential ground water yield, generally greater than 10 gallons per minute to a properly installed well. Deposits consist primarily of glacial sand and gravel, but may include sandy till and alluvium in some areas.

The first aquifer lies in the extreme northern portion of the community surrounding Medomak Pond and extending into Washington and a small portion of Jefferson (most of the aquifer lies within the Town of Washington). Within the Waldoboro portion of this aquifer, which is just under a square mile in size, depth to water table ranges between eight and 15 feet, and the depth of the deposit ranges between 10 and 30 feet. There is one gravel pit within the aquifer, located just west of Medomak Pond.

The second aquifer straddles the Waldoboro/Warren line (the bulk of the aquifer is located in Warren and encompasses the site of the Warren solid waste facility). The portion lying in Waldoboro is roughly located in the area between the Old Augusta Road and Route 235, extending into Waldoboro about 3/4 of a mile from the Waldoboro/Warren line. Within the Waldoboro portion, depth to water table is about 50 feet and the depth of the deposit ranges between eight and 25 feet. There are three gravel pits located in the Waldoboro portion of this aquifer.

The third aquifer is located just south of Havener Pond along the Goose River near the Waldoboro/Friendship/Warren lines. The aquifer is located primarily in Waldoboro, but extends into a portion of Friendship. There are three gravel pits located in the Waldoboro portion of the aquifer. No other data is available.

While not on the Maine Geological Survey's maps, a report prepared by a geologist identified a gravel aquifer which runs along the Medomak river on the east side in the Winslows Mills area, crosses the river, then runs along the west side. The engineers for the water system study identified this aquifer as a potential location for a new water system well, and suggested a well location near the Lincoln County Fish and Game building. A very high capacity well at the former Medomak Canning Company presumably taps into this formation.

Unfortunately, a bedrock aquifer map is not available for Waldoboro. The nature of the bedrock ground water resource is complicated by the nature of ground water flow through crystalline bedrock. This flow is controlled by the distribution and characteristics of brittle fractures in the bedrock. Brittle fracture systems cannot be mapped as easily as coarse sand and gravel deposits present at or near the surface. Estimating the hydraulic properties of brittle fracture systems is also difficult. At the present time, the Maine Geological Survey's bedrock ground water resources program primarily involves collecting, analyzing and publishing information on bedrock wells drilled by commercial well drillers.

Based on the Bedrock Ground Water Resources Basic Data Map - Well Yields, there are a large number of commercially drilled bedrock wells located throughout Waldoboro with yields ranging from 10 gallons to more than 50 gallons per minute.

Flood Plains

The floodplains of the Medomak River watershed from its headwaters to Winslows Mills are currently undeveloped, and thus serve to store excess water during flood events, thereby minimizing damage to downstream properties.

The Federal Emergency Management Agency (FEMA) prepared a Flood Insurance Study for the Town of Waldoboro which was published in 1984. The Medomak River and Little Medomak Pond

Outlet Stream, Medomak Pond and Little Medomak Pond were studied by detailed methods. Approximate methods of analysis were used to study the tidal flats, Alford Brook, Benner Brook, Levensaler Brook, Back Brook, Demuth Brook, Waterman Brook, the Goose River, and numerous unnamed streams.

According to the study, the land within the Medomak River watershed is approximately 75% forest land, 21% open land, 3% water area, and 1% urban. Flooding within Waldoboro occurs most frequently in early spring when heavy rains on snow covered or frozen grounds produces greater than normal runoff. One of the more recent floods occurred in March, 1977, when more than four inches of rain fell on snow covered ground and resulted in general high-water conditions throughout the area. The most serious flooding occurred at the Route 1 bridge over the Medomak River. Ice and floodwaters damaged the bridge deck, causing traffic to be re-routed through the village center. Flooding also occurred on Route 32 and at a mobile home park where several mobile homes had to be evacuated. The picnic area immediately downstream of Route 1 was flooded to a depth of approximately two feet. A number of business parking lots were also flooded. Based on high-water marks in the study area, the recurrence interval of this flood was estimated to be approximately 25 years.

Soils

Prime farmland is defined as land that is best suited to producing food, feed, forage, fiber and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops, and cultivation of these soils results in the least damage to the environment (Hedstrom 1987). About 13% of Lincoln County (soils) are considered prime farmland (Hedstrom 1987; Hedstrom and Popp 1991).

In the Medomak watershed, prime farmland comprises less than 10% of the valley's soils. The predominant prime farmland soils are in the Boothbay, Buxton, Marlow and Peru series, with occasional units of Eldridge and Madawaska scattered throughout the watershed. All of these soil types are either silt loams or fine sandy loams on gently sloping land. The relatively small amount of prime farmland in the Medomak watershed can be attributed to its low relief - marine clays were deposited over much of the valley as the glaciers receded, and most upland soils have low fertility and are naturally acidic due to the parent material of coarse tills and granite. Where moisture is adequate, these areas are typically used for pasture, while excessively drained ridges and slopes (more than 30% of the watershed) are suitable only for blueberries or forests.
Historical and current locations of farms are a good indication of where prime farmland soils are located. The best soils are often located along major roads such as Routes 32 and 220 on middle and upper slopes of ridges. Adequate drainage for septic systems, proximity to roads, and ease of site preparation make sites on these soils also ideal for commercial and residential development. Much of the development that has taken place in the Medomak watershed during the past two decades has occurred on prime farmland soils.

Wetlands

Wetlands cover substantial areas of Waldoboro. These areas serve important ecological, aesthetic, and practical functions. Because of their ability to absorb large amounts of water, wetlands act as catchment areas, containing excessive amounts of water during flood conditions. As a result, wetlands serve to reduce the level of flood crests and minimize flood destructiveness by reducing erosion. Wetlands release their water slowly into the soil, bedrock, and/or surface waters, thus recharging the water table.

Wetlands also play a critical role as natural water treatment systems. They trap sediments that are washed into them from the air and land, and help purify polluted runoff.

Wetlands are among the most biologically diverse and productive ecosystems. Wetlands support a rich diversity of plants and animals, some of which are relatively rare. They are critical nesting, feeding and resting areas for birds, and act as nurseries for fish. They are important sources of food for many species, and may contain unique, scientifically significant areas.

There are literally thousands of wetlands in the Medomak River watershed, ranging in size from a fraction of an acre to nearly one thousand acres. Based on the National Wetlands Inventory, which has documented all wetlands greater than an acre in size, about 10% of the watershed is composed of wetlands. (The Medomak Valley Land Trust, McMahon 1994) has identified ten different wetland community types, including hardwood floodplain forest, red maple swamp, northern white cedar swamp, spruce swamp, forested bog, dwarf shrub bog, beaver flowage, shrub swamp, sedge meadow, and vernal pool. Most of the larger wetlands are actually assemblages of several community types, and are typically associated with the floodplains of streams and ponds. Small, one or two acre swamps and marshes are found wherever topographic depressions occur over poorly drained soils. Perhaps the most ubiquitous and overlooked wetland type in the watershed is the vernal pool. These ephemeral wetlands, which are only a fraction of an acre in size, dot upland forests in the spring and provide critical breeding habitat for frogs, salamanders and turtles. Vernal pools were not included on the National Wetland Inventory maps because they are generally too small to be detected in aerial photographs.

(Three of)the five largest wetlands in the watershed (are located in whole or in part in Waldoboro. (These) are remarkably intact (and) include:

- *<u>Medomak Pond to Rice Heath (partially in Waldoboro, but mostly in Washington)</u> - this is the largest wetland complex in the watershed, measuring more than 990 acres in size. It includes the northern shoreline of Medomak Pond, a hardwood floodplain forest, red maple swamps, spruce swamps, open meadows, alder and willows, and bog. Most of the wetland lies within the one hundred year floodplain of the Medomak River. The Department of Inland Fisheries and Wildlife has identified high value areas for deer and waterfowl within this system.*

- *<u>Wetlands west of Peter's Pond</u> - this approximately 150 acre wetland complex occurs in a steep-sided basin and includes a bog at its center, surrounded by swamps of tamarack and spruce.*

- *<u>Goose River Floodplain (located in Waldoboro and Friendship)</u> - this approximately 500 acre wetland contains the watershed's most extensive example of a red maple swamp community. There are also pockets of spruce, cedar and tamarack, shrub swamp, and open meadow. It provides wintering habitat for deer, as well as habitat for waterfowl.*

Marine Habitats

The diversity and distribution of plants and animals of marine and estuarine ecosystems are strongly influenced by physical parameters such as substrate, waves, currents, salinity, depth, tidal regime, and temperature. Brown (1993) describes 59 different marine and estuarine habitats in Maine, ranging from exposed rocky shore to mud and sand flats to shallow channels and salt marshes. Although an inventory has not been conducted in the Medomak estuary and Muscongus Bay, a series of maps of coastal marine geologic environments (Timson 1974, 1976 a, b, c) suggest that more than 50 of these habitat types occur in the watershed.

A generalized description of the subtidal and intertidal habitats of the watershed follows.

Subtidal habitats

Within the estuary and bay, the bottom can be classified into four types: rock, gravel, sand and mud (Borrer and Cadbury 1966). Near shoals, around offshore islands, and just below the low tide line, the bottom is rock. These rocks are typically covered by many species of red, brown and green algae, and usually a forest of large kelps. In the deeper channels, where the tidal current is strong (such as Hockomock Channel), the bottom consists of loose gravel and shell fragments, with virtually no algae. Sand bottoms are relatively rare. Most of the floor in the upper part of the bay is covered by fine, black mud.

Eelgrass (Zostera marina) beds on muddy substrates are common throughout the estuary and bay. The most extensive beds occur off the public landing at Dutch Neck, between Sampson Cove and Long Cove, and in Hatchet Cove. Eelgrass beds are thought to provide important spawning grounds and nursery areas for a variety of fish and marine invertebrate species and as a result, special protection has been recommended for this habitat type in a number of Atlantic seaboard states. The functional role of eelgrass beds in Maine has not been studied (Brown 1993).

Intertidal Habitats

The shoreline of most of the estuary above The Narrows can be classified as low energy rock shore. As one travels toward Pemaquid Point and the islands offshore, exposure to wind and waves increases, producing the classic zonation of the high energy rocky shore (an upper splash zone of blue-green algae, a periwinkle zone, a barnacle zone, and a rockweed zone).

The most conspicuous habitats in the lower watershed are the mudflats that are exposed at low tide. There are nearly 2,000 acres of mudflats in the estuary and western Muscongus Bay, with more than 700 acres in Waldoboro alone. As of 1993, most of this acreage was open to clamming, except during periods of high runoff when bacteria counts typically exceed healthy levels.

Although salt marshes are a common sight below the head of tide in Waldoboro village, there are no large examples (greater than a hundred acres) in the watershed. Instead, narrow fringing marshes occur between most mudflats and the adjacent upland, and small pocket marshes are common in protected coves.

Two invertebrate species of note include the horseshoe crab and quahog. These warm water or "Virginian" species are uncommon in Maine, except where populations have been isolated in the warmer water at the heads of estuaries and tidal creeks.

The influence of humans on marine habitats in difficult to assess, since there is no baseline that describes original species composition and abundances. In spite of this, there is no doubt that many benthic habitats in the watershed have been greatly altered. The greatest threats to their biological diversity appear to be related to over-harvesting, rather than land-based sources of pollution. For example, kelp and rockweed are often taken for commercial purposes, yet little is known about the effects of the taking of these and other seaweeds on associated species. Clam and baitworm digging is so extensive that finding an undisturbed mudflat community is virtually impossible (Brown, in press). Large portions of the bottom in Muscongus Bay are regularly dredged or trawled, primarily for urchins and scallops. As a result, we have little idea what a natural, undisturbed subtidal community looks like (Brown 1993).

Biological Diversity

Biological diversity can be defined as the variety of life in all its forms - from genes and species to communities and ecosystems. Although we have no way of knowing how many species were lost or displaced when the forests were first cleared for farmland in the 1880s, the Medomak watershed appears to support a diverse and healthy native flora and fauna. Many forest species that were locally extirpated, such as moose, bear and beaver, have returned. Coastal waterbird populations, such as eiders, herons, gulls and cormorants, have rebounded. Game species are generally plentiful, and other species have expanded their ranges northward or eastward into midcoast Maine, such as mockingbirds, cardinals, turkey vultures, coyotes, and opossums.

The watershed is also diverse at the natural community level. A natural community can be defined as the plants and animals of a particular environment, such as a red maple swamp, salt marsh, or headwater stream. Of the 120 natural communities that have been described in Maine, at least 44 occur in the Medomak watershed. They included upland communities such as spruce fir forests and acidic balds, wetlands such as red maple swamps and freshwater marshes, marine habitats such as the rocky shore, mudflats and sand beaches, and a variety of stream and lake types.

The valley landscape is for the most part unfragmented. A close look at property ownership patterns shows that more than 90% of the watershed is composed of lots that are greater than 20 acres in size, and most of these are contiguous. Small lots are for the most part restricted to the village centers, or are found along the major roads between towns. Based on aerial photo interpretation, more than 80% of the riparian corridor (along both fresh and salt water) appears to be forested and undeveloped. This stands in stark contrast to the situation nationwide, where more than 80% of the riparian corridor area has been developed or cleared during the last 200 years (Naiman et al. 1993).

Fish And Wildlife Resources

The Maine Department of Inland Fisheries and Wildlife (MDIFW) has mapped a number of areas in Waldoboro as significant habitat areas for wildlife. These areas, which are important as feeding, resting, wintering and/or breeding grounds for wildlife, include the following:

- **Inland Fisheries.** Inland fisheries are freshwater habitats such as streams, rivers, lakes and ponds with existing or potential value to fish. These habitats are considered areas of special concern because of their importance as recreational or economic resources to the State. Aquatic habitats are also some of the most sensitive and vulnerable. Land use activities that directly affect water quality can significantly alter or destroy the value of these areas for fish. Land clearing or development in the adjacent upland habitat, or"riparian" zone," can also degrade a fisheries. Riparian habitat functions to protect water quality and fisheries values

by filtering out excessive nutrients, sediments or other pollutants leaching in from upland areas, by maintaining water temperatures suitable for aquatic life, and by contributing vegetation and invertebrates to the food base. Riparian habitat is also important as cover for the many species of wildlife attracted to aquatic systems, and serves as a protective travel corridor for movement between undeveloped tracts of land.

MDIFW has identified 23 inland fisheries in Waldoboro (see Table 4-4). Only one of these, the Medomak River, has been identified as a high value habitat area. Moderate value fisheries include Kalers Pond, Little Medomak Pond, Medomak Pond, Peters Pond, Sidensparker Pond, Havener Pond, and Little Medomak Pond Outlet. The remaining fisheries have not been rated.

- **Deer Wintering Areas.** Winter has long been considered a bottleneck for survival of white-tailed deer in the northeast (Severinghaus 1947). During winter, deer in northern climates often subsist on limited quantities of low quality foods, while simultaneously coping with low temperatures, chilling winds and higher energy requirements (Lavigne 1986). When confronted with these conditions, deer must produce more heat to stay warm and they must conserve energy to survive. In Maine, studies indicate that mortality of deer **c**an exceed 35% of the wintering herd during severe winters (Hugie 1973). Frequent severe winters or marginal winter habitat may reduce a deer population to a small fraction of its summer potential (Potvin and Huot 1983).

  The primary behavioral mechanism for deer to conserve energy during winter is to move to traditional wintering areas or "yards." These wintering areas provide deer with shelter from radiant heat loss as well as improved mobility in snow (Mattfeld 1974). The softwood canopy in a deer yard moderates the effects of winter by maintaining warmer than average temperatures and by reducing wind velocities (Lavigne 1986). The softwood cover also intercepts much of the snowfall and ground accumulations become firmly packed (Ozoga 1968). This makes travelling much easier for deer and decreases their energy demands.

  MDIFW has identified 15 deer wintering areas in Waldoboro. These have all been assigned an "indeterminate" value by MDIFW, which means that they have not been studied in detail (see Table 4-4).

- **Waterfowl and Wading Bird Habitat**. Aquatic habitats such as fresh and saltwater marshes, bogs, wet meadows, seasonal vernal pools, shallow lakes and ponds, wooded swamps, and tidal flats are very important to a wide variety of fish and wildlife. Many species of birds, mammals, reptiles, amphibians, fishes, and invertebrates spend part or all of their life cycles tied directly to these areas. Waterfowl, wading birds, songbirds, shorebirds, seabirds, and raptors are just some of the different kinds of birds using wetlands for nesting and feeding. Small and large mammals, including muskrat, beaver, mink, otter, moose and deer, are attracted to these areas because of the availability and abundance of food and cover.

  These areas are also extremely important habitats for reptiles and amphibians such as frogs, toads, salamanders, snakes and turtles. A rich fauna of aquatic invertebrates and fish species, in addition to aquatic vegetation, provides an essential food base in aquatic systems. Coastal salt marshes and tidal flats are important habitat for commonly sought shell and fin fish worth millions annually to Maine fishermen.

  MDIFW has identified 44 waterfowl and wading bird habitat areas in Waldoboro. Two of

these are considered high value areas (the north end of Duckpuddle Pond and the area between Duckpuddle Pond and Pemaquid Pond). There are five moderate value areas as shown in Table 4-4, and the rest are of indeterminate value.

- **Coastal Wildlife Concentration Areas.** Coastal wildlife concentration areas have been identified by MDIFW as important habitat for wildlife in Maine's coastal waters. These areas are special because of the abundance and diversity of wildlife they support, and also because of their importance to rare species. Many different kinds of birds and several different kinds of marine mammals are commonly found in coastal waters during part or all of their life cycles. Waterfowl, wading birds, shore birds, seabirds, ospreys, loons, bald eagles and seals are just some of the wildlife depending on Maine's coastline for feeding, resting, wintering, breeding, and migration habitat.

  Coastal areas offering an abundance of food or protection from weather and predators often support large numbers of marine birds and seals. These concentrations of one or many species are indicators of an area's importance to wildlife.

  MDIFW has identified five coastal wildlife concentration areas in Waldoboro including the Medomak River (Class A), Broad Cove (Class A), Back River (Class C), Jones Neck (Class C) and Goose River (Class C).

- **Seal Haul-Outs**. Maine has the largest population of harbor seals on the Atlantic Coast, and supports the only significant breeding population in the Eastern United States. Gray seals, which are much larger than harbor seals, are uncommon but regular visitors to Maine, and usually are found around remote offshore ledges and islands. Gray seals are known to breed in Muscongus Bay. Although pups are occasionally seen, they have probably dispersed from birth places around Sable Island or the Gulf of St. Lawrence in Eastern Canada.

  Populations of both species were severely depleted by overharvesting throughout the middle of this century, but have increased dramatically during the past 20 years in response to protective legislation. Maine's population of harbor seals has more than doubled since 1973 to an estimated 13,000 plus animals in 1986 (Gilbert and Stein, 1981, C. Wynne, personal communication).

  Seal haul-outs are ledges, beaches and coastal islands traditionally used by seals for pupping and resting. These sites are necessary for the survival of both adults and young. Whelping or pupping sites are used from year to year by the same breeding females, many of which were probably born on these ledges (L. Cowperthwaite, unpublished data). Direct access to high quality feeding areas, and lack of human disturbance, are important characteristics of seal haul-outs.

  MDIFW has identified two seal haul-outs in Waldoboro: Havener Ledge and Back River Ledge.

TABLE 4-4

SUMMARY OF WILDLIFE HABITAT IN WALDOBORO

Town: Waldoboro **County: Lincoln** **Date Prepared: 10-30-91**

	Location	MDIFW#	Rating
A. Fisheries	Kalers Pond		Moderate
	L. Medomak Pond		Moderate
	Gross (Peters) Pond		Moderate
	Sidensparker Pond		Moderate
	Havener Pond		Moderate
	Goose River		Unknown
	Waterman River		Unknown
	Sidensparker Pond Outlet		Unknown
	Alford Brook		Unknown
	Levensaler Brook		Unknown
	Duckpuddle Pond Outlet		Unknown
	Beaver Dam Brook		Unknown
	Tobias Pond Outlet		Unknown
	Medomak River		High
	Kalers Pond Outlet		Unknown
	Benner Brook		Unknown
	Meadow Brook		Unknown
	L. Medomak Pond Outlet		Moderate
	Slaigo Brook		Unknown
	Back Brook		Unknown
	Demuth Brook		Unknown
	Back River		Unknown
B. "Significant" Wildlife Habitat			
1) Habitat for State or Federally Listed Endangered or Threatened Species	None Identified		
2) Deer Wintering Areas (DWA)	NW of Flanders Corner	020492	Indeterminate
	Meadow Brook	020796	Indeterminate
	Medomak R/Rogues Corner	020797	Indeterminate
	SW of Orffs Corner	020515	Indeterminate
	Benner Brook	020798	Indeterminate
	Davis Corner	020799	Indeterminate
	Levensaler Brook	020800	Indeterminate
	Demuth Hill	020677	Indeterminate
	Demuth Brook	020801	Indeterminate
	Beaverdam Brook	020676	Indeterminate
	Sprague Corner	020802	Indeterminate
	Gross Pond	020803	Indeterminate
	Farnsworth Brook	020804	Indeterminate

TABLE 4-4

SUMMARY OF WILDLIFE HABITAT IN WALDOBORO

Town: Waldoboro	County: Lincoln	Date Prepared: 10-30-91	
	Waterman Brook	020805	Indeterminate
	Goose River	020678	Indeterminate
3) Waterfowl and Wading Bird Habitat (WWH), Including Nesting and Feeding Areas	Beaver Dam Brook	030031	Moderate
	Between Flanders & Kennedy Corner	030033	Indeterminate
	N end Medomak Pond	030034	Indeterminate
	E side Medomak Pond	030035	Moderate
	NW of Davis Corner	030036	Indeterminate
	Benner Brook	030037	Indeterminate
	W of Feylers Corner	030038	Indeterminate
	SE of Feylers Corner	030038	Indeterminate
	Slaigo Brook	030039	Indeterminate
	S of Gosham School	030040	Indeterminate
	N of Winslows Mills	030041	Indeterminate
	Havener Pond	030042	Indeterminate
	S of Orffs Corner	030010	Moderate
	W of Kennedy Corner	030043	Indeterminate
	NE of Flanders Corner	030045	Indeterminate
	NW of Flanders Corner	030046	Moderate
	Levensaler Brook Flowage	030047	Indeterminate
	W end Levensaler Brook	030048	Indeterminate
	E of Bogues Corner	030049	Indeterminate
	S end Sidensparker Pond	030050	Moderate
	N of Little Medomak Pond	030052	Indeterminate
	Medomak River	030056	Indeterminate
	SW of Bogues Corner	030057	Indeterminate
	Alford Brook	030058	Indeterminate
	S of Manks Corner	030059	Indeterminate
	Tobias Pond	030008	Indeterminate
	W of Manktown Road	030062	Indeterminate
	W of Winslow Mills	030030	Indeterminate
	N end Duckpuddle Pond	030009	High
	E shore Duckpuddle Pond	030064	Indeterminate
	Duckpuddle to Pemaquid Pond	030006	High
	S of Beaverdam Brook	030067	Indeterminate
	W of West Waldoboro	030068	Indeterminate
	Back Brook, north	030074	Indeterminate
	NW of Sidensparker Pond	030075	Indeterminate
	Back Brook, south	030076	Indeterminate
	N of Waterman Brook	030078	Indeterminate
	W of Gross Neck	030083	Indeterminate
	Goose River Swamp	030084	Indeterminate
	Outlet Medomak Pond	030085	Indeterminate
	E of Cooks Pond	030012	Indeterminate
	E of Davis Corner	030086	Indeterminate
	Benner Corner	030087	Indeterminate
	E of Winslow Mills	030088	Indeterminate

TABLE 4-4

SUMMARY OF WILDLIFE HABITAT IN WALDOBORO

Town: Waldoboro	**County: Lincoln**	**Date Prepared: 10-30-91**
4) Shorebird Nesting, Feeding and Staging Areas	Meetinghouse Cove tidal flats Note: Shorebird information for Waldoboro is incomplete.	
5) Seabird Nesting Islands	None Identified.	
6) Coastal Wildlife Concentration Areas	Class A Areas: Medomak River Broad Cove Class C Areas: Back River Jones Neck Goose River	

Source: Maine Department of Inland Fisheries and Wildlife.

Reptiles and Amphibians

According to Hunter et.al. (1992), which documents presence and absence of amphibian and reptile species by town, the following 20 species have been documented in the towns of the watershed, and at least 5 other species listed as "probable" are likely to occur here. The information in Table 4-5 is based on scattered observations of local residents and naturalists rather than a systematic census. Species that have been formally documented in one or more watershed towns, such as blue-spotted salamanders and grey treefrogs, are likely to be widespread throughout the watershed. However, statewide trends suggest that populations of many formerly abundant species, such as the leopard frog and snapping turtle, may be declining. Explanations range from habitat loss (filling of wetlands and vernal pools), more and more road kills as the density of roads and traffic increase, and atmospheric pollutants, such as ozone and acid rain. The status of the amphibian and reptile populations in the Medomak watershed is unknown.

TABLE 4-5

AMPHIBIANS AND REPTILES IN THE MEDOMAK WATERSHED

Species	Towns	Comments
Amphibians		
Spotted salamander	Waldoboro, Jefferson, Nobleboro, Bremen, Bristol	Widespread
Blue-spotted salamander (Tremblays)	No records	Probable
Eastern newt	Waldoboro, Jefferson, Bremen, Bristol	Widespread
Dusky salamander	No records	Uncommon, but probable
Two-lined salamander	No records	Probable
Four-toed salamander	No records	Documented in Newcastle
Redback salamander	Bremen, Bristol	Widespread
American toad	Waldoboro, Nobleboro, Bremen, Bristol	Widespread
Gray treefrog	Waldoboro	Widespread
Spring peeper	Waldoboro, Jefferson, Bremen, Bristol, Nobleboro	Widespread
Bullfrog	Waldoboro, Jefferson, Union	Widespread
Green frog	Waldoboro, Jefferson, Union, Warren	Widespread
Pickerel frog	Warren, Washington, Bristol	Widespread
Northern leopard frog	Jefferson	Declining?
Wood frog	Waldoboro, Nobleboro, Bremen, Bristol	Widespread
Reptiles		
Snapping turtle	No formal records	Probably widespread
Common musk turtle	Union, Bristol	Uncommon; northern range limit in valley
Painted turtle	Washington, Appleton, Liberty, Jefferson, Bristol, Waldoboro	Widespread
Ringneck snake	Jefferson, Bristol	Uncommon
Milk snake	Jefferson, Bremen, Bristol	Widespread
Northern water snake	Jefferson	
Smooth green snake	Bristol	
Brown snake	Bristol	Uncommon; near northern limit
Redbelly snake	Washington, Bristol	
Common garter snake	Washington, Jefferson, Bristol, Bremen	Widespread

Source: The Medomak River Watershed - A Natural Resource Inventory, Medomak Valley Land Trust, 1994.

Note: This table lists only those towns where species have been formally documented through the Maine Amphibian and Reptile Atlas Project (MARAP). Species described as widespread are likely

to occur in most if not all watershed towns. In addition, at least one species for which there are no records - the snapping turtle - has been seen in the watershed by members of the NRI advisory committee and MVLT board.

Freshwater, anadromous and catadromous fish

A variety of warm and cold water fish inhabit the Medomak River watershed. Storer Pond support(s) both warm and cold water species (brown trout are stocked). The remaining ponds are inhabited by warm water species such as yellow perch, chain pickerel, and largemouth bass. Also of significance is the Medomak River alewife fishery, which ranks fifteenth in the State (Sam Chapman, personal communication). The river also supports a winter smelt fishery and runs of American eel and sea run brown trout.

The spring smelt run occurs between April and early May. Streams supporting spring runs of rainbow smelt include German Cemetery Brook, Slaigo Brook, and Farnsworth Brook and the Goose River. Table 4-6 includes a listing of species which occur within the freshwater portions of the watershed.

TABLE 4-6

FRESHWATER FISH OCCURRING IN THE MEDOMAK VALLEY WATERSHED

Freshwater Fish	Minnows
Smallmouth bass	Lake chub
Largemouth bass	Blacknose dace
Chain pickerel	Redbelley dace
Pumpkinseed sunfish	Golden shiner
Yellow perch	Common shiner
White perch	Blackchin shiner
Common sucker	
Hornpout (bullhead)	**Anadromous species**
Brook trout	Alewife
Brown trout	Rainbow smelt
Banded killifish	Sea run brown trout
Ninespine stickleback	
	Catadromous species
	American eel

Source: The Medomak River Watershed - A Natural Resource Inventory, Medomak Valley Land Trust, 1994.

Natural Areas Program

The Maine Department of Conservation administers the Natural Areas Program which collects information on uncommon or outstanding natural features. This information may include information on unusual plants, exceptional plant or animal habitat, geologically or historically significant areas, and outstanding scenic areas.

The Natural Heritage Program staff are able to provide interested communities with an interpretive analysis of significant natural communities that could occur within the town, but this step has not been undertaken for Waldoboro, nor has a detailed, systematic survey been undertaken. There may be instances of rare species within the community, but these have yet to be identified and entered into the Natural Areas Program data base.