Town of Carmel Comprehensive Plan

2011

ACKNOWLEDGEMENTS

The Town would like to recognize and thank all of those individuals who assisted in the development of this Plan.

This Plan is the result of work by town officials, staff, the Comprehensive Plan Committee and interested citizens. Tom Richmond (Town Manager) and Stewart Brooks (Code Enforcement Officer) provided staff support for the development of the Comprehensive Plan.

The Comprehensive Plan Committee members included: Russell Treadwell, Chair, Suzan Rudnicki, John DeLuck, Jahn Hudson, Mark Holmes, Herbert Dean, Mary Lou Hargreaves, Amy Porter, Stephanie True and Janice Noyes.

Consultants that assisted in the development of the Plan included Gwen Hilton (planning consultant) and Cindy Pellette (mapping).

The Town would also like to thank all of the citizens who completed the public opinion survey and/or otherwise provided input into the development of the Comprehensive Plan.

INTRODUCTION

PURPOSE OF THE COMPREHENSIVE PLAN

The Comprehensive Plan serves many purposes…

- A vision, or blueprint, for the future - for the next 10 to 20 years
- The townspeople taking charge of their future
- A way to control town costs and increases in property taxes
- A way to access grant money, such as for roads and bridges, the library, recreation facilities or other facilities or programs
- A practical guide to managing growth and directing public policy
- A legal foundation for local regulations

COMPREHENSIVE PLAN COMMITTEE AND PUBLIC PARTICIPATION SUMMARY

The Comprehensive Plan Committee began working on the Plan in 2009 and completed the Plan by the end of 2011. The planning process consisted of over twenty meetings of the Committee to review and consider the various sections of the plan. A public opinion survey was conducted in 2010. Reports on the progress in developing the Plan were included in the Annual Town Reports. Articles were also included in the Town's newsletter. A public hearing will be held prior to the vote on the Plan.

THE COMPREHENSIVE PLAN CONSISTS OF TWO PARTS:

Part I. Recommendations: Goals, Policies and Implementation Strategies – The recommendations are designed to provide future direction for the town for the next decade. The goals are general, the policies are more focused, and the implementation strategies are specific actions designed to carry-out the policies. Implementation strategies are prioritized and the entities responsible for implementation are identified.

Part II. Inventory and Analysis – Part II contains the background information that provides the data and analysis to support the recommendations. It examines population and housing, local economy, community facilities and services, transportation, recreational opportunities, municipal finance, natural resources, historic and cultural resources, agriculture and forestry, and land use.

The Comprehensive Plan was prepared in accordance with the Maine Comprehensive Planning and Land Use Regulation Act, its goals and criteria.

IMPLEMENTATION OF THE COMPREHENSIVE PLAN

The Comprehensive Plan Committee recommends that the Carmel Board of Selectmen appoint the Planning Board to oversee implementation of the recommendations of this Plan. The Planning Board would be responsible for prioritizing the recommendations and monitoring the town's progress in implementing the recommendations.

The Planning Board should meet at least every five years to conduct a complete evaluation of the Plan's implementation to determine the following: the degree to which future land use plan strategies have been implemented; progress in implementing the Capital Investment Plan; and overall development trends. If the Board's evaluation concludes that portions of the current plan and/or its implementation are not effective, the Board will propose changes as needed.

Town of Carmel Comprehensive Plan

Part I. Recommendations: Goals, Policies and Implementation Strategies

The Carmel Comprehensive Plan is divided into two sections (separate books):

- ***Part I*** *describes the goals, policies and implementation strategies recommended by the Comprehensive Planning Committee.*
- ***Part II*** *consists of data compiled by the Town of Carmel and the State of Maine. The information in Part II was used by the Comprehensive Planning Committee to determine the recommendations, goals, policies and implementation strategies found in Part I.*

Part I. Table of Contents

VISION FOR THE FUTURE OF CARMEL

INTRODUCTION

Carmel is a small, rural bedroom community to the greater Bangor urban area. The town has a year-round population of almost 2,800[1]. The town has a small central village and rural residential homes scattered along many of its rural roads. Commercial development, generally small in scale, is located primarily along Route 2. Interior areas not located along town roads are relatively undeveloped forestland and open lands that contribute to the community's rural character. The citizens of Carmel are generally happy with their town.

CARMEL'S GREATEST ASSETS

The following is a list of Carmel's greatest assets – those it wishes to retain:

- Small town rural character
- Small central village which serves as the civic and cultural center of the community
- Rural landscape - open fields and forests, lovely streams, ample wildlife habitat
- Spacious residential neighborhoods
- Relatively affordable land and housing
- Location within easy commuting distance of the greater Bangor metropolitan areas, where there are job opportunities and a broad range of goods and services
- Community supported, small-town government with an active citizenry
- Close-knit community of caring citizens
- Business friendly atmosphere

[1] *According to the 2010 Census, Carmel's population was 2,794.*

RESPONDING TO FUTURE TRENDS

Population growth and its impacts on Carmel are inevitable. One only needs to look to neighboring Hermon to see what may lie ahead for Carmel, particularly with respect to housing development. Carmel's year-round population is projected to increase modestly by about 120 people between 2010 and 2020[2]. This increase in population would result in at least 60 new year-round homes. The demand for new housing will probably be considerably more factoring in the changing needs of an older population and people's desires for new housing. For example, the Town issued permits for 305 new homes including mobile homes between 2000 and 2010[3].

With respect to other uses, there will likely be more home occupations, cottage industries and other small to medium-sized business endeavors. As a result of this growth there will be more traffic on roads and highways, and increased demands on town services and facilities.

Citizens will also have to respond to increasing energy and fuel costs. More small business and services in Carmel would reduce travel costs and help support the local tax base.

THE FUTURE

Carmel's vision for the future is to retain its assets, while accommodating anticipated growth and development in a way that does not harm existing uses, and natural and cultural resources. Carmel will benefit from its location relative to the greater Bangor area and the service center community of Newport to the west. Route 2 will be greatly improved as an east-west corridor and as a major connector to more urban areas for Carmel residents.

Carmel's thriving village will continue to be the civic and cultural center of the community. Residential growth will continue to occur in areas near the Hermon town line, where residents will have direct access to the greater Bangor area for goods and services, and employment. Town roads will be maintained to support primarily residential traffic. Commercial growth, consistent with Carmel's character, will continue to occur along the Route 2 corridor, but will be designed to maintain safe and efficient traffic flow on Route 2. Natural development constraints, such as the extensive wetlands, along with state and local regulations will continue to protect open land and important natural resources.

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[2] *Maine State Planning Office, 2000*

[3] *Carmel Code Enforcement Officer, 2010*

A. ECONOMY

GOAL

Promote an economic climate that will increase job opportunities, maintain a high level of employment, and provide the opportunity for a high standard of living for the citizens of Carmel.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Encourage commercial and industrial expansions that are compatible with Carmel's rural character, vision and other goals.

2. Identify those areas of town that are most suitable for industrial and commercial development and encourage the expansion of these activities within the designated areas.

3. Businesses, such as service industries and light manufacturing, should be encouraged in order to expand the tax base. In addition, commercial enterprises, such as small stores, banks, and other consumer services that would serve the needs of Carmel residents should be allowed in appropriated areas.

4. The expansion of residential/small scale farming and home industries should be encouraged. Restrictions on these activities should be kept to the minimum required to prevent adverse affects on the environment and neighboring properties.

   Strategy: Review and amend the town's land use ordinance, as appropriate, to assure that the provisions of the ordinance reflect these three policies, and the Vision and policies and strategies in the Future Land Use Plan.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term[4]

5. Coordinate with the school district to maintain and encourage a high standard of education in order to raise the level of aspirations among the student population. This could include the development of a program to make students more aware of occupational opportunities.

   Strategy: Encourage RSU 87/SAD 23 to work in implementing this policy.

[4] *"Short-term" means within 5 years; "Mid-Term" means plus or minus 5 years; "Long Term" means more than 10 years.*

Responsibility: Carmel School Board Representative(s); Timeframe: Ongoing

Additional Policies to Address State Goals[5]

1. Support the type of economic development activity the community desires, reflecting the community's role in the region.

2. Make a financial commitment, if necessary, to support desired economic development, including needed public improvements.

3. Coordinate with regional development corporations and surrounding towns as necessary to support desired economic development.

Additional Strategies to Address State Goals

1. Enact or amend local ordinances to reflect the desired scale, design, intensity, and location of future economic development.

   See locally developed policies and strategies above.

2. If public investments are foreseen to support economic development, identify the mechanisms to be considered to finance them (local tax dollars, creating a tax increment financing district, a Community Development Block Grant or other grants, bonding, impact fees, etc.)

   Continue to advocate for adequate maintenance of the Route 2 corridor which is critical to Carmel's and Maine's economic well-being.

   Consider improvements to the village area infrastructure, such as adequate water/sewage disposal, to support desired village scale residential and business activities. See Capital Investment Plan in this document for more details.

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing and Long-term

3. Participate in any regional economic development planning efforts.

   Carmel will participate in regional economic development initiatives, such as those with Eastern Maine Development Corporation and neighboring towns, as appropriate and within its capacity as a small town.

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing

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[5] *These are designed to further address the required minimum policies and strategies to address state goals, Chapter 208: Comprehensive Plan Review Criteria Rule.*

B. HOUSING

GOAL

Encourage and promote affordable, decent housing opportunities for all Carmel citizens.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Encourage and allow for desirable, affordable housing to be built satisfying the increasing demand, to meet State mandates for housing, and to provide decent housing opportunities for all citizens of Carmel.

2. Allow for a variety of housing types so that residents of all income levels can find adequate housing, and ensure that the town's land use ordinances do not discriminate against affordable housing, including affordable rental facilities.

3. Encourage well-built, structurally sound housing.

4. Protect the character of existing residences by incorporating appropriate land use controls into the town's ordinances. At the same time, ensure that land-use standards are not so restrictive that they impose unnecessary regulations on residents or exclude affordable housing from locating in Carmel.

5. Allow manufactured and mobile homes on any privately owned lot that meets the minimum lot size for a single-family home and all town building codes. All permanent homes of this type should meet specified health, safety, and aesthetic guidelines (such as skirting and types of foundations).

6. Establish standards for the conversion of existing buildings to two or more dwelling units to provide additional housing options and to maintain the character of the areas where residential conversions occur.

   Carmel will review existing land use regulations to determine if they reflect the policies and strategies above, and make amendments as appropriate.

   Responsibility: Planning Board, CEO; Timeframe: Short-term

Additional Policies to Address State Goals

1. Encourage and promote adequate housing to support community and regional economic development.

2. Ensure that land use guidelines encourage the development of quality affordable housing, including rental housing.

3. Encourage and support the efforts of regional housing coalitions in addressing affordable housing needs.

Additional Strategies to Address State Goals

Carmel will utilize the above local policies and strategies to address the state policies [and strategies] to the extent practicable.

Responsibility: Planning Board, CEO; Timeframe: Ongoing and long-term

C. WATER RESOURCES

GOAL

Protect the quality and manage the quantity of water resources, including aquifers, great ponds, rivers, streams and wetlands.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Protect and preserve the natural resources of Carmel including, but not limited to, the following: lakes, streams, and wetlands (Etna Pond, Harvey Stream, Slate Quarry Brook, Tracy Brook, Black Stream, Hill Brook, Souadabscook Stream, and Wiggins Meadow); all known aquifers; deer wintering areas, waterfowl nesting areas; and forest and agricultural land. The protection of these resources will be accomplished through appropriate land use standards, the enforcement of the State's natural resources protection laws, and other appropriate methods.

2. Preserve natural areas along lakes and streams. In addition, provide minimum setbacks from lakes and streams with stringent guidelines regarding septic systems and drainage fields to re-

duce the risk of pollution. Enforce the State Shoreland Zoning requirements to help accomplish this goal.

Carmel's shoreland zoning ordinance provides adequate and appropriate protection for streams, lakes and other waterbodies in Carmel.

Carmel will continue to adequately enforce the Maine Plumbing Code and Subsurface Wastewater Treatment laws.

Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

3. Protect the water quality of Etna Pond from the effects of shore line development, soil erosion, farm runoff, and other potential sources of pollution that could lead to water quality deterioration. Also, work with other towns on Etna Pond to ensure the safe and orderly development of the pond's surroundings.

   Carmel will do the following to protect the water quality of Etna Pond:

   a. *Require that projects proposed for the Etna Pond watershed will not contribute excessive phosphorus or other contaminants that will degrade water quality.*

   b. *Assure that construction practices for roads, both public and private roads, do not result in water quality degradation to Etna Pond.*

   c. *Work with the towns of Etna and Stetson to manage and protect Etna Pond, as appropriate. This should include educational efforts on the threat of aquatic invasive species.*

   Responsibility: Planning Board, Code Enforcement Officer, Town Manager; Timeframe: Ongoing

4. Protect the town's groundwater quality, particularly in the areas of mapped sand and gravel aquifers. Implement water quality protection measures as recommended in this plan.

   Carmel will review existing land use regulations and amend if necessary to provide adequate protection for sand and gravel aquifers.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

5. Reduce the negative impacts of new development by adopting stormwater management and erosion and sedimentation control standards.

   Carmel will review existing land use regulations and amend if necessary to provide adequate stormwater management and erosion and sedimentation control. This effort will include consideration for protection provided through state regulation.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

6. Carmel will continue to monitor the need to participate in the U.S. Federal Floodplain Management Program that requires regulation of development on floodplains and provides subsidized flood insurance for property owners on the floodplain.

   Responsibility: Town Manager; Timeframe: Ongoing

Additional Policies to Address State Goals

1. Protect current and potential drinking water sources.

2. Protect significant surface water resources from pollution and improve water quality where needed.

3. Cooperate with neighboring communities and regional/local advocacy groups to protect water resources.

Additional Strategies to Address State Goals

1. Adopt or amend local land use ordinances as applicable to incorporate stormwater runoff performance standards consistent with state laws.

   See local policy #5 above

2. Maintain, enact or amend public wellhead[6] and aquifer recharge area protection mechanisms, as necessary.

   Carmel will review and amend its land use regulations as necessary to protect public wells. This will include state requirements that owners of public wells be notified when projects are proposed nearby.

   Responsibility: Planning Board, Code enforcement Officer; Timeframe: Short-term and ongoing

3. Encourage landowners to protect water quality. Provide local contact information at the municipal office for water quality best management practices including with the Natural Resource Conservation Service, University of Maine Cooperative Extension, Soil and Water Conservation District, Maine Forest Service, and/or Small Woodlot Association of Maine.

   Carmel will refer landowners to these agencies.

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[6] *"Public wells include wells at schools, mobile home parks, restaurants, office buildings, etc. State law requires that well owners take steps to protect water supplies. Septic systems must be at least 300 feet from wells, and underground fuel storage tanks at least 1,000 feet away. Towns are required to notify well owners when projects are proposed nearby.*

Responsibility: Town Office staff; Timeframe: Ongoing

4. Adopt water quality protection practices and standards for construction and maintenance of public and private roads and public properties and require their implementation by contractors, owners, and community officials and employees.

5. Participate in local and regional efforts to monitor, protect and, where warranted, improve water quality.

6. Provide educational materials at appropriate locations regarding aquatic invasive species.

Strategies #4 through #6 above are addressed under local policies.

D. NATURAL RESOURCES

GOAL

Protect other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, shorelands, scenic vistas, and unique natural areas.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Protect and preserve the natural resources of Carmel including, but not limited to, the following: lakes, streams, and wetlands (Etna Pond, Harvey Stream, Slate Quarry Brook, Tracy Brook, Black Stream, Hill Brook, Souadabscook Stream, and Wiggins Meadow); all known aquifers; deer wintering areas, waterfowl nesting areas; and forest and agricultural land. The protection of these resources will be accomplished through the creation of appropriate land use standards, the enforcement of the State's natural resources protection laws, and other appropriate methods.

2. Preserve critical and unique natural areas within Carmel such as the Mountain Laurel stand located off of the Irish Road, the cranberry bog at the southern end of Etna Pond (Fall Fimbry), deer wintering areas, significant waterfowl and wading bird habitat, rare plant and animal habitats, and important fisheries.

3. Maintain and improve the variety of wildlife in Carmel by maintaining habitat diversity. Encourage the conservation of open land in Carmel to protect wildlife habitat, scenic vistas, and to provide outdoor recreation opportunities for Carmel residents.

   Carmel will explore a number of approaches to support conservation of wildlife habitat and open space, including the following:

   a. *Distribute or make available information to those living in or near critical or important natural resources about current use tax programs and applicable local, state, or federal regulations, and educational materials.*

   b. *Invite a representative of Maine Inland Fisheries and Wildlife to make a presentation to town officials and members of the public about the benefits of protecting wildlife habitat, such as deer yards and important fisheries.*

   c. *Review and amend the land use ordinance as appropriate to include performance standards to require that developers identify critical natural areas and take reasonable steps to minimize impacts.*

   Responsibility: Selectmen, Planning Board, Code Enforcement Officer, as appropriate; Timeframe: Short-term and ongoing

4. Build a higher awareness of natural resource needs among future generations, by encouraging more natural resource education in local schools beginning in the elementary school and carrying through to high school.

   Carmel will encourage RSU 87/SAD 23 teachers and staff to include in their curriculum and extracurricular activities an understanding and appreciation for the town's natural resources.

   Responsibility: School Board Representatives; Timeframe: Ongoing

5. Ensure that new development is located on properly suited soils, particularly where on-site sewage disposal is proposed. The intensity of development should be compatible with the site's soil capabilities to prevent malfunctioning of on-site disposal systems and to ensure that construction is located in suitable areas.

   Review and amend land use ordinances as necessary to assure new development is located appropriately.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Ongoing

Additional Policies to Address State Goals

1. Conserve critical natural resources in the community.

2. Coordinate with neighboring communities and regional and state resource agencies to protect shared critical natural resources.

Additional Strategies to Address State Goals

1. Ensure that land use ordinances are consistent with applicable state law regarding critical natural resources.

   Carmel will review and amend its land use ordinances as necessary to assure that they are consistent with applicable state laws regarding natural resources.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Ongoing

2. Designate critical natural resources as Critical Resource Areas in the Future Land Use Plan.

   Carmel will review the shoreland zoning ordinance to assure that it provides adequate and appropriate protection for fragile shorelands and other critical natural resources in Carmel. Critical wildlife and fisheries habitat protected through shoreland zoning would include salmon and other fisheries of Souadobscook Stream, ten significant waterfowl and wading bird habitats, rare freshwater mussel (Creeper) habitat along Black Stream, a rare plant (Fall Fimbry) habitat along the shores of Etna Pond, and other important wildlife and fisheries habitats.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

3. Through local land use ordinances, require subdivision or non-residential property developers to look for and identify critical natural resources that may be on site and to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.

4. Through local land use ordinances, require the Planning Board to include as part of the review process, consideration of Beginning with Habitat maps and information regarding critical natural resources.

   Carmel will review and amend its land use regulations as necessary to assure adequate protection of critical natural resources, including consideration for strategies #3 and #4 above.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

E. AGRICULTURE AND FOREST RESOURCES

GOAL

Safeguard agricultural and forest resources from development which threatens those resources.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Protect and preserve forest and agricultural land through the creation of appropriate land use standards, the enforcement of the State's natural resources protection laws, and other appropriate methods.

2. Timber harvesting should follow good forest management practices as defined by the "Maine Forest Practices Act."

   Carmel will encourage and monitor compliance with the Maine Forest Practices Act to the extent practicable.

   Responsibility: Code Enforcement Officer; Timeframe: Ongoing

Additional Policies to Address State Goal

1. Safeguard lands identified as prime farmland or capable of supporting commercial forestry.

2. Support farming and forestry and encourage their economic viability.

Additional Strategies to Address State Goal

1. Consult with the Maine Forest Service district forester when developing any land use regulations pertaining to forest management practices as required by 12 MRSA §8869.

2. Consult with Soil and Water Conservation District staff when developing any land use regulations pertaining to agricultural management practices.

   Regarding strategies #1 and #2 above, Carmel does not envision developing land use regulations pertaining to forest management practices or agricultural management practices. However, if in the future there is a need to do so Carmel will consult with the applicable agencies.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Unknown

3. Amend land use ordinances to require commercial or subdivision developments in rural areas to maintain areas with prime farmland soils as open space to the greatest extent practicable.

   Carmel will continue to zone rural areas as Farming-Residential to support agricultural and forestry activities to the extent they are still viable in the town. Further, Carmel will encourage developers to retain prime farm soils as open space for future use for growing vegetables and other crops applicable to a suburban community.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

4. Limit non-residential development in rural areas to natural resource-based businesses and services, nature tourism/outdoor recreation businesses, farmers' markets, and home occupations.

5. Permit land use activities that support productive agriculture and forestry operations, such as roadside stands, greenhouses, firewood operations, sawmills, log buying yards, and pick-your-own operations.

   To address strategies #4 and #5 above, Carmel will review and amend its land use ordinance as appropriate to consider natural resource-based uses that would be compatible with and complimentary to residential areas.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Short-term and ongoing

F. HISTORIC AND ARCHAEOLOGICAL RESOURCES

GOAL

Preserve important historic and archaeological resources.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Promote an understanding of the town's history to all town residents and, as far as possible, preserve those homes, buildings, cemeteries, and other historical features that reflect the town's heritage.

2. Identify and preserve important historical and archaeological sites in town.

3. Encourage the Carmel Historical Society to continue its work to do the following: preserve the Simpson Memorial Library, conduct historic presentations, videotape conversations with older residents, work on a history of Carmel, produce an annual historic calendar and other activities to promote and preserve the town's historic and archaeological resources.

4. Encourage owners of historic properties to maintain them for future generations. Discourage inappropriate development near scenic or historical areas of town.

   Responsibility: Historic Society with support from the Board of Selectmen; Timeframe: Ongoing

Additional Policies to Address State Goals

1. Protect to the greatest extent practicable the significant historic and archaeological resources in the community.

Additional Strategies to Address State Goals

Note: At a minimum the following could be narrowed to just include sites or structures eligible or already listed on the National Register of Historic Places (none have been identified in Carmel at this time)

1. For known historic archeological sites and areas sensitive to prehistoric archeology, through local land use ordinances require subdivision or non-residential developers to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.

2. Adopt or amend land use ordinances to require the Planning Board to incorporate maps and information provided by the Maine Historic Preservation Commission into their review process.

   Regarding strategies #1 and #2 above, Carmel will inform developers about the presence of known historically and archaeologically significant resources, such as the archaeologically sensitive areas around Etna Pond, Souadabscook Stream, and Harvey Stream including Wiggins Meadow, and a small portion of Tracy Brook where in flows into Souadabascook Stream, and the Ruggles Place historic site, and Ruggles and Robinson Mill sites.

   Carmel will encourage developers to takes steps to minimize impacts to these sites to the greatest extent practicable.

   Responsibility: Planning Board, Code Enforcement Officer; Timeframe: Ongoing

3. Work with the local or county historical society and/or the Maine Historic Preservation Commission to assess the need for, and if necessary plan for, a comprehensive community survey of the community's historic and archaeological resources.

   Carmel will encourage the Carmel Historic Society to inventory, evaluate and take reasonable steps to protect important archaeological and historic sites.

Responsibility: Carmel Historical Society; Timeframe: Ongoing

G. PUBLIC FACILITIES AND SERVICES

GOAL

Plan for, finance and develop an efficient system of public facilities and services to accommodate anticipated growth and economic development.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Provide the services and facilities that Carmel citizens require for safe and comfortable living while maintaining a balanced town budget that avoids the need to impose tax increases.

2. Maintain fire and ambulance services with adequate equipment and well trained personnel.

   Responsibility: Carmel Fire and Rescue Department; Timeframe: Ongoing

3. Dedicate monies paid to the town for the use of fire and ambulance services to a special equipment fund to be used specifically for those services. Also, examine the cost of providing these services to other towns to determine if Carmel is being adequately reimbursed.

   Responsibility: Board of Selectmen; Timeframe: Ongoing

4. The Fire Department and Ambulance Service should each establish short and long-range plans to address such issues as increasing volunteer membership, equipment and facility needs, education/prevention programs, and the training of members. The feasibility of paid staff (part-time or full-time) or other alternatives to provide adequate day-time coverage for the town should also be explored.

   Responsibility: Carmel Fire and Rescue Department; Timeframe: Ongoing

5. Continue to provide part-time police protection through a contract with the Penobscot County Sheriff's Department. Periodically evaluate service.

Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing, Mid-term

6. Develop a long-range plan to address sewage disposal and water quality problems in the village. An investigation of properties experiencing problems should be undertaken and alternatives to address these problems should be evaluated. Means of financing alternative solutions should also be explored, including grant funding.

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Medium-Long Term

7. Continue to provide curb-side pickup of solid waste, bulky waste and recyclables in a cost-effective manner. Appoint a Committee to study recycling.

   Responsibility: Recycling Committee, Town Manager, Board of Selectmen; Timeframe: Short Term

8. Periodically review current contracts, contracting procedures, and provisions for road maintenance, snowplowing, trash pick-up, police protection, and other purchased services and improve as warranted. (A review was completed recently)

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing, every 5 years

9. Improve and maintain the transportation infrastructure as recommended in the Transportation recommendations. *See Transportation section.*

10. Continue to support the development of the Simpson Memorial Library, including on-going growth to attain the State's recommended minimum standards. Work to complete the Library addition and other needs through continued fundraising, ongoing municipal support and grant funding.

    Responsibility: Library Board of Directors, Town Manager, Board of Selectmen; Timeframe: On-going

11. Monitor medical and social service needs, and take action as appropriate and necessary.

    Responsibility: Health Officer, Town Manager, Board of Selectmen; Timeframe: Ongoing

12. Improve and maintain recreation facilities as recommended in the Recreation recommendations. *See Recreation section.*

Additional Policies to Address State Goals

1. Efficiently meet identified public facility and service needs.

2. Provide public facilities and services in a manner that promotes and supports development.

Additional Strategies to Address State Goals

1. Identify any capital improvements needed to maintain or upgrade public services to accommodate the community's anticipated growth and changing demographics.

2. If public water supply is anticipated, identify and protect suitable sources.

3. Explore options for regional delivery of local services.

   Carmel's Strategies to address the above policies and strategies:

   a. *Capital improvements designed to address anticipated needs are identified and prioritized in the Capital Investment Plan of this document.*

   b. *Carmel's potential growth-related investments include the library addition and any investment designed to address sewer/water issues – both these investments would be in the village.*

   c. *Carmel will continue to provide ongoing maintenance and improvements to existing facilities, such as roads, bridges, municipal buildings, and the recreation area as needed.*

   d. *Carmel will continue its policy not to create new public infrastructure, such as new town roads, and sewer and/or water, particularly in rural areas of town.*

   e. *If the town decides to develop a new public water supply for the village, steps will be taken to protect the water source.*

   f. *Carmel will continue to explore opportunities for regional coordination (See Regional Coordination near end of the Recommendations).*

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing

H. TRANSPORTATION

GOAL

Plan for, finance and develop an efficient system of public facilities and services to accommodate anticipated growth and economic development.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Overall Policy: Ensure the safe and orderly flow of traffic through and within the Town of Carmel. Upgrade and maintain existing roads to a high standard of excellence. Also, ensure that reasonable access is provided to town maintained roads for new commercial and residential developments.

2. Develop a plan to correct all current transportation concerns in Carmel as outlined in the "Inventory and Analysis" section. Assign priorities to the list of needed road improvements.

   Responsibility: Selectmen, Town Manager (Road Commissioner) Timeframe: Ongoing

3. As a high priority, continue to strongly advocate for adequate maintenance of Route 2.

   Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

4. Continue to upgrade town roads over time through ongoing improvements to sub-bases, road surfaces and ditches as funding and time allows.

   Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

5. Continue to encourage the formation of road associations responsible for maintaining subdivision roads. To support this policy, continue to require that subdivision roads meet minimum design standards and develop minimum road association standards.

   Responsibility: Selectmen, Town Manager (Road Commissioner), Planning Board; Timeframe: Ongoing

6. Provide an area clear of brush along the right-of-way at all road intersections to allow an unobstructed view of on-coming traffic.

   Responsibility: Town Manager (Road Commissioner); Timeframe: Ongoing

7. Continue to require a state driveway permit as required by state law. Also, require adequate traffic visibility for all new driveways on town roads through the town's driveway permitting system.

   Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

8. Upgrade bridges where they may be inadequate or deteriorated. Seek financial and technical assistance from the outside sources when appropriate.

   Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

9. For State maintained roads, notify the Department of Transportation where speed limit and safety related signs need to be erected or replaced. For town maintained roads, erect and replace these signs as needed.

   Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

10. Improve road safety by providing street lighting where appropriate and increasing the number of directional signs. Replace these signs as needed.

    Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

11. Work with MDOT to improve the traffic safety and flow patterns in the village at the intersection of Route 2 and Route 69.

    Responsibility: Selectmen, Town Manager (Road Commissioner); Timeframe: Ongoing

12. Ensure that major developments are well planned in regard to access and setbacks, especially from major transportation routes. Ordinance requirements may be reviewed and, where necessary, additional regulations may be enacted to facilitate better transportation planning.

    Responsibility: Planning Board, CEO; Timeframe: Ongoing

13. When planning for future development, attempt to minimize the number of curb cuts on major roads. Enforce all State and local laws and ordinances relating to encroachment on town or state maintained roads.

    Responsibility: Town Manager (Road Commissioner), Planning Board, CEO; Timeframe: Ongoing

14. Encourage developers to construct roads for new subdivisions, keeping new construction off major roads by building circular drives and creating interconnections to adjacent development and property, etc., where possible.

    Responsibility: Planning Board, CEO; Timeframe: Ongoing

15. Require traffic impact studies for proposed developments above a specified size and ensure that commercial and industrial development is located and built to minimize the impacts of traffic on residential neighborhoods.

    Responsibility: Planning Board, CEO; Timeframe: Short-term and Ongoing

16. Continue to support public transportation.

    Responsibility: Board of Selectmen, Town Manager; Timeframe: Ongoing

Additional Policies to Address State Goals

1. Prioritize community and regional needs associated with safe, efficient, and optimal use of highway systems.

2. Promote public health, protect natural and cultural resources, and enhance livability by managing land use in ways that maximize the efficiency of the highway system and minimize increases in vehicle miles traveled.

3. Assist residents (including children, the elderly and disabled) in finding transportation by providing information at the town office about available services.

4. Promote fiscal prudence by maximizing the efficiency of the state or state-aid highway network.

Additional Strategies to Address State Goals

1. Develop or continue to update a prioritized improvement, maintenance, and repair plan for the community's transportation network.

   See local policy #2, and other pertinent policies above.

2. Initiate or actively participate in regional and state transportation efforts.

   See local policy #3, and other pertinent policies.

3. Maintain, enact or amend local ordinances as appropriate to address or avoid conflicts with:

    a. Policy objectives of the Sensible Transportation Policy Act (overall state transportation polices) (23 M.R.S.A. §73);

    b. State access management regulations (state driveway and entrance permitting) pursuant to 23 M.R.S.A. §704; and

    c. State traffic permitting regulations for large developments (Site Location of Development Law) pursuant to 23 M.R.S.A. §704-A.

Periodically review the town's ordinances and policies to assure consistency with state policies and laws.

Responsibility: Town Manager (Road Commissioner), Planning Board, CEO; Timeframe: Ongoing

4. Maintain, enact or amend ordinance standards for subdivisions and for public and private roads as appropriate to foster transportation-efficient growth patterns and provide for future street connections.

See local policies.

I. RECREATION

GOAL

Promote and protect the availability of outdoor recreation opportunities for all citizens of Carmel, including access to surface water.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Continue recreation committee responsibilities for the oversight and coordination of all recreation programs and facilities in the Town of Carmel. This committee should be responsible for the creation of a recreation program (including short-term and long-term goals) that will provide for the most efficient use of all recreational assets of the town. Attainment of the goals listed below should also be the responsibility of the recreation committee.

   Continue to fund the part-time Recreation Director position to oversee Carmel's Recreation Program.

   Responsibility: Board of Selectmen; Timeframe: Short-Term, Ongoing

2. Continue to maintain and improve the Town's recreational facilities including the Recreation Area.

   Responsibility: Board of Selectmen, Town Manager; Timeframe: Ongoing

3. Encourage and coordinate with RSU 87/SAD 23 in the provision of recreational facilities and programs at schools for Carmel residents.

Responsibility: Carmel Recreation Director, Board of Selectmen, Carmel School Board representative(s); Timeframe: Ongoing

Additional Policies to Address State Goals

1. Maintain/upgrade existing recreational facilities as necessary to meet current and future needs.

2. Preserve open space for recreational use as appropriate.

3. Seek to achieve or continue to maintain at least one major point of public access to major water bodies for boating, fishing, and swimming, and work with nearby property owners to address concerns.

Additional Strategies to Address State Goals

1. Create a list of recreation needs or develop a recreation plan to meet current and future needs. Assign a committee or community official to explore ways of addressing the identified needs and/or implementing the policies and strategies outlined in the plan.

   See locally developed policies and strategies

2. Carmel will encourage the local snowmobile club and other trail organizations to work with landowners to develop and maintain trail networks that connect to regional trail systems where possible.

   Responsibility: Board of Selectmen; Timeframe: Ongoing

3. Provide educational materials regarding the benefits and protections for landowners allowing public recreational access on their property. At a minimum this will include information on Maine's landowner liability law regarding recreational or harvesting use, Title 14, M.R.S.A. Section 159-A.

   Carmel will provide educational materials for landowners at the Town Office and/or through links on the town's WEB page.

   Responsibility: Town Manager; Timeframe: Ongoing

4. Address the need for public access to waterbodies as follows:

   a. *Encourage the Town of Etna to continue to maintain public access to Etna Pond.*

   b. *Continue to allow public access to Souadabscook Stream at the Recreation Area.*

   Responsibility: Board of Selectmen; Timeframe: Ongoing

J. CAPITAL INVESTMENT PLAN

OVERVIEW

The Capital Investment Plan is a summary list of municipal capital investments anticipated during the planning period (next 10-15 years) in order to implement the strategies in the comprehensive plan. It provides a framework for long-range scheduling and financing for the replacement and expansion of public facilities. The primary goal is to anticipate major expenditures, and to prioritize and schedule the funding of these projects in a fiscally sound manner that minimizes drastic changes in tax levels. By anticipating future needs, the town is better able to take advantage of outside funding opportunities as they arise. Carmel does not currently have a capital investment or capital improvements plan.

A capital investment is defined as a major construction project or purchase that requires funds from sources other than normal operating expenses. Capital investments are usually relatively expensive ($10,000 or more, depending on what threshold the town wishes to use[7]), don't reoccur annually, last a long time, and usually result in fixed assets.

There are three major approaches to paying for capital needs: (1) "Pay Out Now 100 Percent of Costs", usually through a town meeting appropriation; (2) "Borrow and Pay Debt Service" through a loan or bond; and (3) "Save and Buy" through reserve accounts. A balanced capital investment program may use all three of these approaches, plus other funding mechanisms, depending upon circumstances, such as lease purchase agreements, grants, trust funds, outside contributions, and user fees.

Carmel has used all three of these approaches to pay for capital needs: a general obligation bond for roads and a note for school garage construction, reserve accounts (building, equipment, cemeteries, etc.), trust accounts (library, cemeteries) and annual appropriations.

This Capital Investment Plan is designed to dovetail with the other recommendations of this Comprehensive Plan. The capital projects listed were identified in the inventory and analysis and are a key part of planning for the next ten to fifteen years.

GOAL

Plan for, finance and develop an efficient system of public facilities and services to accommodate anticipated growth and economic development.

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[7] *"Capital Investment" means expending municipal funds of $20,000 or more to purchase assets of land, machinery, equipment, or buildings. (Chapter 208: Comprehensive Plan Review Criteria Rule)*

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Maintain a strong fiscal capacity that will allow for orderly expansion of municipal services required to support increasing needs of the town. Also, continue to maintain the healthy balance between income, expenditures, and reserves.

2. Develop a capital investment plan to meet present and future needs of the town.

3. Review alternatives for financing major purchases and ensure the use of sound financial practices when making these purchases.

4. Designate appropriate areas of town for commercial and industrial uses to encourage a mix of uses that will provide a broad and stable tax base and lessen the tax burden on town residents. (See Future Land Use Plan)

5. Monitor the availability of State and Federal programs that will assist the town in meeting the goals of this plan; apply for those programs that are suitable.

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing

Additional Policies to Address State Goals

1. Finance existing and future facilities and services in a cost effective manner that avoids major spikes in property taxes.

2. Explore grants available to assist in the funding of capital improvements within the town to reduce sole reliance on property taxes.

3. Strive to reduce the town's tax burden by staying within LD 1 spending limitations.[8]

Additional Strategies to Address State Goals

1. Explore opportunities to work with neighboring communities to plan for and finance shared or adjacent capital investments to increase cost savings and efficiencies.

   Responsibility: Town Manager, Board of Selectmen; Timeframe: Ongoing

[8] *LD 1. An Act to Increase the State Share of Education Costs, Reduce Property Taxes and Reduce Government Spending at All Levels (enacted 1/20/05). The key to the LD 1 tax burden reduction is to keep the percentage growth in taxes below the percentage increase in personal income.*

CAPITAL INVESTMENT NEEDS

Anticipated Capital Investment Needs in Order to Implement the Comprehensive Plan Projects with Potential Funding Requirements for the Town (10-15 Year Timeframe)				
Project Description	Cost Estimate	Potential Funding Source/Mechanism	Timetable/Priority[9]	Location
Recreation Field/ Cemeteries	$12,000	Recreation/Cemetery Reserve Account	2012	Village
Major Equipment	$250,000	Equipment Reserve Account	Ongoing	Town-wide
Library Addition	$250,000	Fundraising, Reserve Account, Library Trust Fund, Grants	Ongoing	Village
Water/Sewer in Village	Unknown, requires further study	Bond, Grant with Local Match, new Reserve account	Long-Term	Village
Davis Road Bridge	$10,000	Bridge Reserve	Mid -Term	Commercial
Source: Town Manager, October 2011				

[9] *"Short-term" means within 5 years; "Mid-Term" means plus or minus 5 years; "Long Term" means more than 10 years.*

K. FUTURE LAND USE PLAN

GOAL

Encourage orderly growth and development in appropriate areas of the community, while protecting rural character, making efficient use of public services, and preventing development sprawl.

POLICIES AND STRATEGIES

Locally Developed Policies and Strategies

1. Regulate land use and development to the extent necessary to protect natural resources, property values, and public safety. However, over-regulation should be avoided. Residents should not feel that they have lost their freedoms as landowners due to overly restrictive regulations.

2. Continue to monitor the need to protect and regulate development in floodplain areas through the adoption of a floodplain ordinance.

3. Ensure that existing gravel pit and junkyard regulations are enforced. Comply with existing State regulations through the adoption of local ordinances where needed in order to provide additional protection for the town.

4. Maintain appropriate farm and forest practices to prevent pollution, run-off, and the subsequent devaluation of land.

5. Encourage the use of internal access roads within larger subdivisions and discourage the use of odd-shaped lots to increase the number of lots in proposed subdivisions. Ensure that access is provided to all newly created lots.

6. Revise the zoning map as needed to ensure that development is permitted in the most appropriate areas of town in regards to natural resource constraints and existing land use patterns.

7. Update the Carmel's zoning, subdivision, and mobile home park standards to ensure that they adequately regulate the development occurring in town and comply with current land use laws. Also, revise these ordinances so that the standards are more specific, are appropriate for the existing conditions, and reflect the recommendations of this Comprehensive Plan.

8. Permit and encourage smaller retail and service businesses to locate in the village area, and along Route 2. Also, encourage new commercial businesses to enhance their appearance through landscaping and other design requirements.

Policies to Address State Goals

1. Coordinate the community's land use strategies with other local and regional land use planning efforts.

2. Support the locations, types, scales, and intensities of land uses the community desires as stated in the Town's vision.

3. Establish efficient permitting procedures throughout the Town.

4. Protect rural areas from the impacts of development.

5. Consider providing the capital improvements identified in the Capital Investment Plan.

Strategies to Address State Goals

1. Assign responsibility for implementing the Future Land Use Plan to the appropriate committee, board or municipal official.

   Carmel will assign this ongoing responsibility to the Code Enforcement Officer and the Planning Board, upon enactment of this Comprehensive Plan.

2. Using the descriptions provided in the Future Land Use Plan narrative, maintain, enact or amend local ordinances as appropriate to:

   a. Clearly define the desired scale, intensity, and location of future development.

   b. Continue to maintain fair and efficient permitting procedures, and explore streamlining permitting procedures.

   c. Clearly define protective measures for critical natural resources and, where applicable, important natural resources.

   Carmel will implement this strategy, in accordance with the following Future Land Use Plan Narrative, during the two years after approval of this Comprehensive Plan.

3. Include in the Capital Investment Plan anticipated municipal capital investments needed to support proposed land uses. (See Capital Investment Plan)

4. Meet with neighboring communities to coordinate land use designations and regulatory and non-regulatory strategies.

   Carmel will monitor activity in neighboring communities, and meet when necessary.

5. Provide the Code Enforcement Officer (CEO) with the tools, training, and support necessary to enforce land use regulations, and ensure that the CEO is certified in accordance with 30-A MRSA §4451.

   Carmel will continue to ensure that the CEO has the capacity to meet the requirements of this strategy.

6. Track new development in the community by type and location.

   Carmel's CEO will continue to track new development.

7. Periodically (at least every five years) evaluate implementation of this Plan to determine the degree to which future land use plan strategies have been implemented. If this evaluation concludes that portions of the current plan and/or its implementation are not effective, the Town may make changes as needed.

   Carmel's Code Enforcement Officer and Planning Board will conduct this evaluation periodically, as needed. Changes will be recommended, as appropriate.

8. Continue to address power outages, flooding and other weather events as needed.

   Carmel's emergency management personnel will continue to address these issues on an ongoing and as needed basis.

FUTURE LAND USE PLAN NARRATIVE

Introduction

The Future Land Use Plan is designed to implement the Vision for Carmel through the Year 2022 and Beyond. The plan is based on projected population growth and past trends in residential and commercial development. Growth areas are those areas where most development has been occurring over the past ten years, and where it is most desirable in the future. Most residential development (subdivision and single homes) has occurred in areas near Hermon, perhaps in large part due to residents who commute to the Bangor area for employment. A modest amount of commercial development is anticipated, and should be located with access to Route 2, where it is most likely to be successful due to visibility and accessibility.

The village is the only more densely developed area in Carmel, but future growth and expansion is limited by environmental constraints and the lack of centralized sewer and/or water. Enhancement of the village is an important part of this Future Land Use Plan.

Critical natural resources and other important natural resources are important to Carmel's quality of life. These areas are primarily protected through regulation and the fact that many areas are not developable due to environmental constraints, such as wetlands and shallow soils.

To date, extreme weather events and unusual weather patterns have not had much of an impact on Carmel's natural and built environment. For example, flooding impacts have been minimal. Carmel will need to monitor the risks and opportunities of future climate change, and be prepared to respond as necessary.

Implementation of the Future Land Use Plan would entail amendments to the Carmel's existing land use regulations, including the Land Use/Zoning Ordinance and Subdivision Ordinance.

DESCRIPTION OF FUTURE LAND USE AREAS

Village Area

The village area will become a new district that continues to support existing mixed uses (residential, public, semi-public, small businesses) with expansions and new similar and compatible uses added where suitable land is available. While expansion of the village might be desirable, there are existing constraints that limit infill and expansion. The village does not have a public water system or a public sewer system, and there a number of small lots where there is concern about contamination from on-site septic systems. Another constraint is the lack of developable land in areas around the existing village due to wetlands and poor soils. The Town does have land in the village where a clustered/community septic system might be constructed.

Given these constraints the following recommendations are proposed. The minimum lot size would re-main at 2 aces, but consideration will be given for accessory apartments and other uses that do not overburden sewage treatment capacity. For example, the minimum lot size for 2-family dwellings would continue to be 2.5 acres, and for multifamily dwellings the minimum lot size would continue to be 2.5 acres plus .5 acres for each additional unit.

To support enhancement of the village, the town might consider the following:

1. Improve the attractiveness of the village as a place to live, recreate and do business (shade tree program, landscaping, etc.).
2. Allow community wastewater/water systems funded by homeowners using state-of-the-art technology.
3. Investigate options for a community water system.
4. Assure that regulations support compatible mixed uses appropriate to village character by con-tinuing to require Special Use Permits for uses that might negatively impact neighborhoods.
5. Continue to provide necessary infrastructure – roads, streets, recreation area, etc.

Commercial Areas

Commercial growth areas are similar to the existing commercial areas and are designed to provide areas for commercial growth (small to medium-sized businesses). The Commercial Growth Area extends along Route 2 to provide an area with the greatest potential to support commercial expansion and growth that is appropriate for Carmel. Under the Future Land Use recommendations the village district would replace the existing commercial district that extends through the village.

The Commercial District would continue to have a minimum lot size of 2 acres, with a minimum road frontage requirement of 200 feet. The District would continue to allow residential uses, including apartment houses, motels, filling stations, restaurants, offices, grocery stores and other similar uses that conveniently provide goods and services for local people. Development constraints and protection for critical natural resources along major portions of the Route 2 corridor would limit strip development. The single most significant capital need in this area is maintenance and improvement of Route 2.

To support this type of growth, the Town should consider the following recommendations:

1. Allow all lots that have frontage on Route 2 to have the whole lot designated as Commercial. This would be based on the existing configuration of these lots as of a specified date, such as the enactment of this amendment to the land use/zoning ordinance. Any lot expansions or reconfigurations after the specified date would require special Planning Board approval. Given the existing lot layouts along Route 2 this would be a way to increase the depth of the commercial area along Route 2 east of Irish Road area, and the area closest to the Hermon town line, where development is most desirable. The lots along other areas of Route 2 are smaller and are not as deep.

2. Assure that regulations clearly reflect the types of commercial uses desired.

3. Encourage internal road connections between developments to reduce traffic conflicts associated with driveway entrances along Route 2.

4. Explore other options to promote nodes or clusters of commercial development.

[Note: Numbers 1, 3, and 4, combined with development constraints (primarily wetlands) would effectively minimize strip development along Route 2 without drastically modifying the existing zoning.]

Residential-Farming Area

The Residential-Farming areas will be those areas not included in the village area, commercial areas and the following critical natural resource areas, and will continue to be zoned as the existing Residential-Farming District. These areas are very much a part of Carmel's vision for the future. This district allows single-family homes, mobile homes, churches, and schools, and supports open space uses, such as farming and forestry. Compatible neighborhood commercial uses would continue to require special use permits through the Planning Board. The minimum lot size in the Residential-Farming area would continue

to be 2 acres. The town would continue to support back-lot development. With respect to municipal infrastructure, a considerable amount of work has been done to maintain and improve town roads and bridges in this area. Other than continuing to improve and maintain the town's roads and bridges, the town does not anticipate any other major capital improvements in these areas.

Recommendations for improving these areas include:

1. Monitor the effectiveness of the ordinance provision supporting back lot development, and modify, if needed to further encourage development with frontage on interior roads.
2. Assure that allowed uses reflect the desire for residential neighborhoods.
3. Assure that there are adequate protections for residential neighborhoods by continuing to require Special Use Permits for commercial uses and other uses that might negatively impact residential-farming areas.
4. Consider allowing road and pedestrian interconnections between developments.
5. Consider allowing open space subdivisions designed to preserve important natural resources and discourage strip development while maintaining a minimum density of 2 acres per house.

Critical Natural Resources[10]

Critical natural resources will continue to be protected through existing regulations, including the town's land use/zoning ordinance, subdivision regulations, shoreland zoning, and state/federal laws. The following are recommended to improve consideration for these resources:

1. Amend ordinances to require that applicants of proposed projects (subdivision, special uses, etc.) notify the owners of the public water supplies (school, mobile home parks) in the vicinity of their projects as required by state law.
2. Use Beginning with Habitat (BwH) information on the location of important wildlife and fisheries habitats.
3. Make reference to the mapped BwH information in ordinances, and require that developers take steps to avoid or minimize impacts to important natural habitats.
4. Providing education on protection of critical natural resources.

[10] *Critical natural resources are those natural resources which under federal and/or state law warrant protection from the negative impacts of development.*

GENERAL RECOMMENDATIONS FOR LAND USE ORDINANCES

1. Update ordinances to comply with current state laws, such as mobile home park regulations, state building code, state subdivision and shoreland zoning statues, etc.
2. Update ordinances to include provisions like – a severability clause – so that if one section of ordinance does not hold up to court challenge, the whole thing will not be thrown out. This is just one of several housekeeping types of changes that are needed.
3. Update and add definitions to clarify what is intended by terms used in the ordinance. For example, a permit is required for an entrance, but there is no definition for an entrance.
4. Update and modernize (electronic format) the "Official Zoning Map" to make it more accessible and as required in the Carmel Land Use/Zoning Ordinance and state law.
5. Update the ordinance to include some newer uses or broader categories of uses, and to contain more specific performance standards to ensure that permitted uses and uses requiring a special use permit are appropriately regulated.
6. Provide a more detailed definition for "uses injurious, noxious or offensive to the neighborhood" to give the Planning Board more guidance on what is intended.

L. REGIONAL COORDINATION

SUMMARY OF REGIONAL COORDINATION POLICIES AND STRATEGIES

Regional coordination is an important part of providing for the needs of the town and planning for the future. The following is a summary of regional coordination that Carmel currently does, as well as recommendations for future coordination efforts. These are listed by topic area.

Economic Development - participate in regional economic development initiatives, such as those with Eastern Maine Development Corporation and neighboring towns, as appropriate and within Carmel's capacity as a small town.

Housing – support efforts of regional housing coalitions in addressing affordable housing needs, as appropriate and within Carmel's capacity as a small town.

Natural Resources –

1. Work with the towns of Etna and Stetson to manage and protect Etna Pond, as appropriate. This should include educational efforts on the threat of aquatic invasive species.
2. Encourage RSU 87/SAD 23 teachers and staff to include in their curriculum and extra-curricular activities an understanding and appreciation for the town's natural resources.
3. Ensure consistency with state natural resources protection laws

Services and Facilities – continue to work with neighboring communities and other partners for efficient delivery of services, including the following:

1. Solid waste disposal through membership in the Penobscot Energy Recovery Company (PERC);
2. Household hazardous waste disposal and recycling through the City of Bangor
3. Emergency dispatch through the Penobscot County Regional Communications Center
4. Regional emergency and disaster planning through the Penobscot County Emergency Management Agency
5. Contract for sheriff's deputy through the Penobscot County Sheriff's Department
6. Fire and rescue participation in county-wide mutual aid program, as well as mutual-aid agreements with Etna, Stetson, Hermon, and Levant
7. Ambulance back-up through Hermon and Bangor
8. Public education as member of RSU 87/SAD 23 with Levant

Transportation –

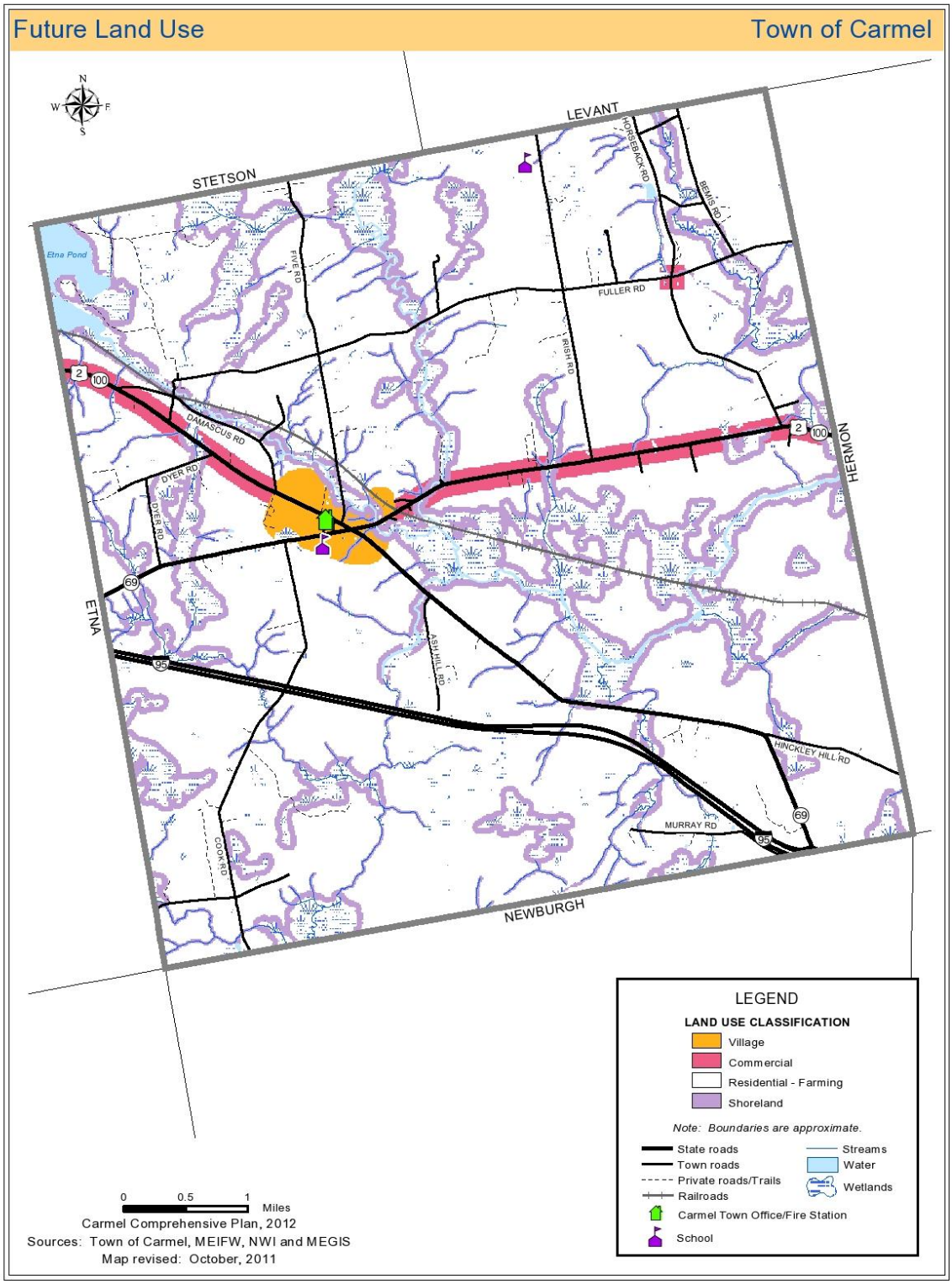
1. Advocate for adequate maintenance of Route 2
2. Require state driveway permits, as required by state law
3. Maintain consistency with Maine Department of Transportation policies and laws

Recreation –

1. Encourage the local snowmobile club, local ATV club, and other trails organizations in their efforts to develop and maintain trail networks that connect to regional trail systems where possible.
2. Monitor opportunities to work with land trusts and conservation organizations in protecting and preserving important open space or recreation land.

M. FUTURE LAND USE MAP

See next page


Future Land Use
Town of Carmel
N
W
E
S
LEVANT
STETSON
HERMON
ETNA
NEWBURGH
Etna Pond
FIVE RD
FULLER RD
IRISH RD
HORSEBACK RD
BEMIS RD
DAMASCUS RD
DYER RD
ASHHILL RD
COOK RD
HINCKLEY HILL RD
MURRAY RD
2
100
69
95
0 0.5 1 Miles
Carmel Comprehensive Plan, 2012
Sources: Town of Carmel, MEIFW, NWI and MEGIS
Map revised: October, 2011
LEGEND
LAND USE CLASSIFICATION
Village
Commercial
Residential - Farming
Shoreland
Note: Boundaries are approximate.
State roads
Town roads
Private roads/Trails
Railroads
Streams
Water
Wetlands
Carmel Town Office/Fire Station
School

Town of Carmel Comprehensive Plan

Part II.

Inventory and Analysis

2011

The Carmel Comprehensive Plan is divided into two sections (separate books):

- ***Part I*** *describes the goals, policies and implementation strategies recommended by the Comprehensive Planning Committee.*
- ***Part II*** *consists of data compiled by the Town of Carmel and the State of Maine. The information in Part II was used by the Comprehensive Planning Committee to determine the recommendations, goals, policies and implementation strategies found in Part I.*

Part II. Table of Contents

CHAPTER 1. POPULATION AND DEMOGRAPHICS

Overview

Predicting future population changes is important to community planning because it affects housing, jobs, health care, social desires, education, and other community services. This chapter examines the characteristics of Carmel's population - population growth (birth and death rates, in-migration), seasonal population levels, population age characteristics, educational attainment, and income and poverty rates. A state and regional perspective is presented to provide context for the analysis.

State and Regional Perspective

Population growth is primarily driven by the economic climate of an area. Social trends, geographic location and physical setting also contribute to the growth or decline of a population. Maine's population grew at one of the slowest rates in the nation during the 1990s. Lower birth rates and higher mortality consistent with the aging of the "baby boom" generation[1], and young adults leaving in search of better jobs were factors. The economic recession of the 1990s resulted in fewer job opportunities and contributed to this loss of population.

Maine's population grew slightly faster during the early part of the 21st century primarily as a result of the in-migration of people from away. In fact, in-migration to Maine between 2000 and 2004 was over seven times greater than natural increase (i.e., population change due to births minus deaths). While southern and coastal counties experienced the greatest in-migration, Penobscot County gained only 540 new migrants.[2] Southern Penobscot County generally experienced growth while population growth was more stagnant in more northern parts of the county. Carmel and southern Penobscot County have also been impacted by suburbanization and sprawl with people choosing to live in more affordable rural areas, as opposed to urban, suburban, and coastal areas.

Maine is projected to experience continued slow growth in population over the next decade due to the overall age of its population and slow economic growth. Maine has one of the oldest populations in the country. Population growth will be mostly the result of people moving to Maine as opposed to an increasing birth rate. Additionally, some of these newcomers will be retirees from other states. Maine was projected to experience very modest economic growth, including growth in the number of jobs for the rest of this decade - even prior to the current recession. This suggests that in-migration of people looking for a job may be modest, and young adults may have to continue to leave the state to find employment.

[1] *The "baby boom" generation consists of people born between 1947 and 1964.*

[2] *"Charting Maine's Future", Brookings Institution Metropolitan Policy Program, 2006; analysis of U.S. Census data.*

SUMMARY[3]

Is the rate of population change expected to continue as in the past, or to slow down or speed up? What are the implications of this change?

Carmel's year-round population was estimated to be 2,665 as of 2009[4]. Projections suggest that the population will increase slowly by about 15.6 people per year, or an increase of about 156 people between 2010 and 2020. This would result in a total population of around 2,840 by the year 2020. Slow population growth has implications for future needs, including housing, services, and the tax base to support those services.

Which demographic groups are the fastest growing and which are in decline?

Carmel's overall population will be an older one in the future. There will be proportionately more middle age and older people. This will primarily be the result of the aging of the existing population, and young adults (age 20 to 35) continuing to move out of town, which means fewer births and children in the future.

What will be the likely demand for housing, municipal and school services to accommodate the change in population and demographics, both as a result of overall change and as a result of change among different age groups?

An aging population can have significant impacts, including a decline in school enrollments, a decline in the size of the workforce, and shifting needs for housing, transportation and services. Household size is decreasing which means more housing per person will be needed in the future. This all implies more housing will be needed, particularly housing for an older population. Municipal services, health services and transportation needs will need to shift to meet the needs of this older and aging population, even though overall population growth will be slow.

If most of the population growth is the result of newcomers, what can the community do to foster shared outlooks?

Newcomers will account for about 19% of population growth (22 out 119 in projected population increase over the next ten years), if the trends of 2000 through 2007 continue. Almost 75% of Carmel's population growth during the 1990s was the result of people moving into town. About 19% of population growth between 2000 and 2007 was the result of people moving into town. Carmel is a friendly and welcoming town and will continue to be so in the future.

If the community has a significant seasonal population, is the nature of that population changing? What is the community's relationship to and dependence on seasonal visitors?

[3] Maine's Growth Management program requires that comprehensive plans answer these questions.

[4] *The 2010 U.S. Census population for Carmel was 2,794.*

Carmel has a very small seasonal population that primarily consists of people with second homes or camps on Etna Pond. Some business, such as restaurants, the campground, and convenience stores, benefit from seasonal visitors, including those just passing through town.

If the community is a service center or has a major employer, what additional effort does it have to make to serve a daytime population that is larger than its resident population?

Carmel is not a service center community, so its daytime population is not generally larger than its resident population. The only major employer in Carmel is the school district.

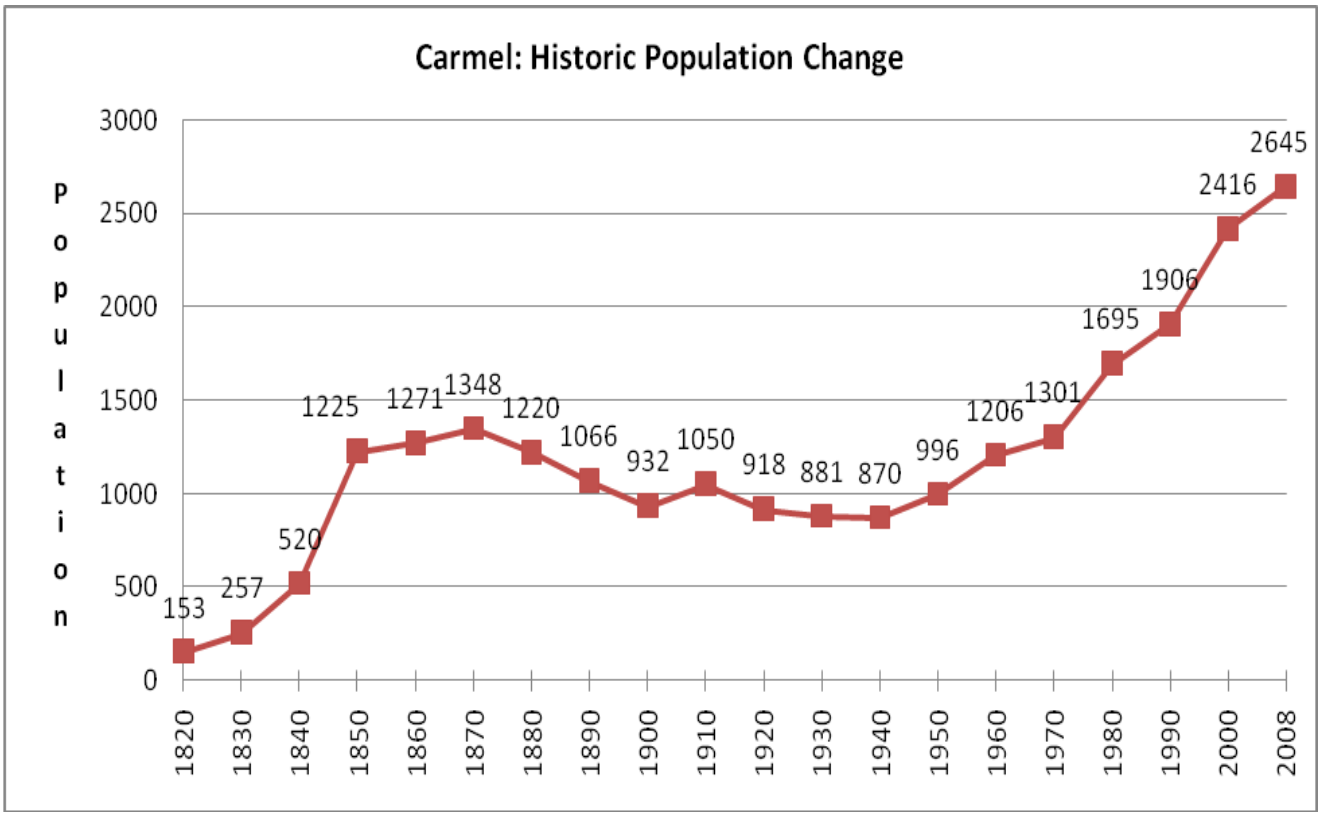
SUPPORTING DOCUMENTATION

Historic Population Change in Carmel

Carmel's population was estimated to be 2,665 as of 2009 (U.S. Census). The population has fluctuated over the years, with 153 people in 1820, followed by fairly rapid population growth to 1,348 people in 1870. The population then declined and fluctuated finally leveling off by the 1920s and 1930s. The population began to grow again in the 1940s.

Since 1970 the population has more than doubled, from 1,301 in 1970 to 2,645 in 2008. The most rapid growth occurred during the 1970s and the 1990s.

Figure 1-1. Source: U.S. Census



Population growth during the 1990s was primarily due to in-migration (people moving into town), as opposed to natural change (births minus deaths) (Table 1-1). During the 1990s, nearly 75% (382 people) of population growth was due to in-migration. Many of these were people looking to live in a rural community and commuting to the Bangor metropolitan area.

Since 2000 in-migration has dropped dramatically, such that the increase is estimated to be only 18.5%. The cost of commuting to work may explain some of the decline in in-migration.

Also noteworthy is that the births have exceeded deaths during the past 2½ decades.

Table 1-1. Population Growth: Natural Change and Migration

Years	Population Change	Births	Deaths	Natural Change*	Migration*	Growth due to Migration
1980s	211	308	126	182	29	13.7%
1990s	510	303	175	128	382	74.9%
2000-07	189	284	130	154	35	18.5%

*Notes: Natural change = births +/- deaths. Migration (people moving into or out of town) = Total population change +/- natural change. Source: U.S. Census; Maine Department of Health and Human Resources, Office of Data, Research and Vital Statistics, Carmel Town Reports

Population Change in the Future

Carmel's population was estimated to be 2,665 as of July 1, 2009. This was 249 people more than in 2000 when the population was 2,416. This is an increase of about 28 people per year.

Carmel's population is projected to increase much more slowly over the next two decades. Carmel is projected to increase by 11.9 people per year between 2010 and 2020 and 3.7 persons per year between 2020 and 2030.

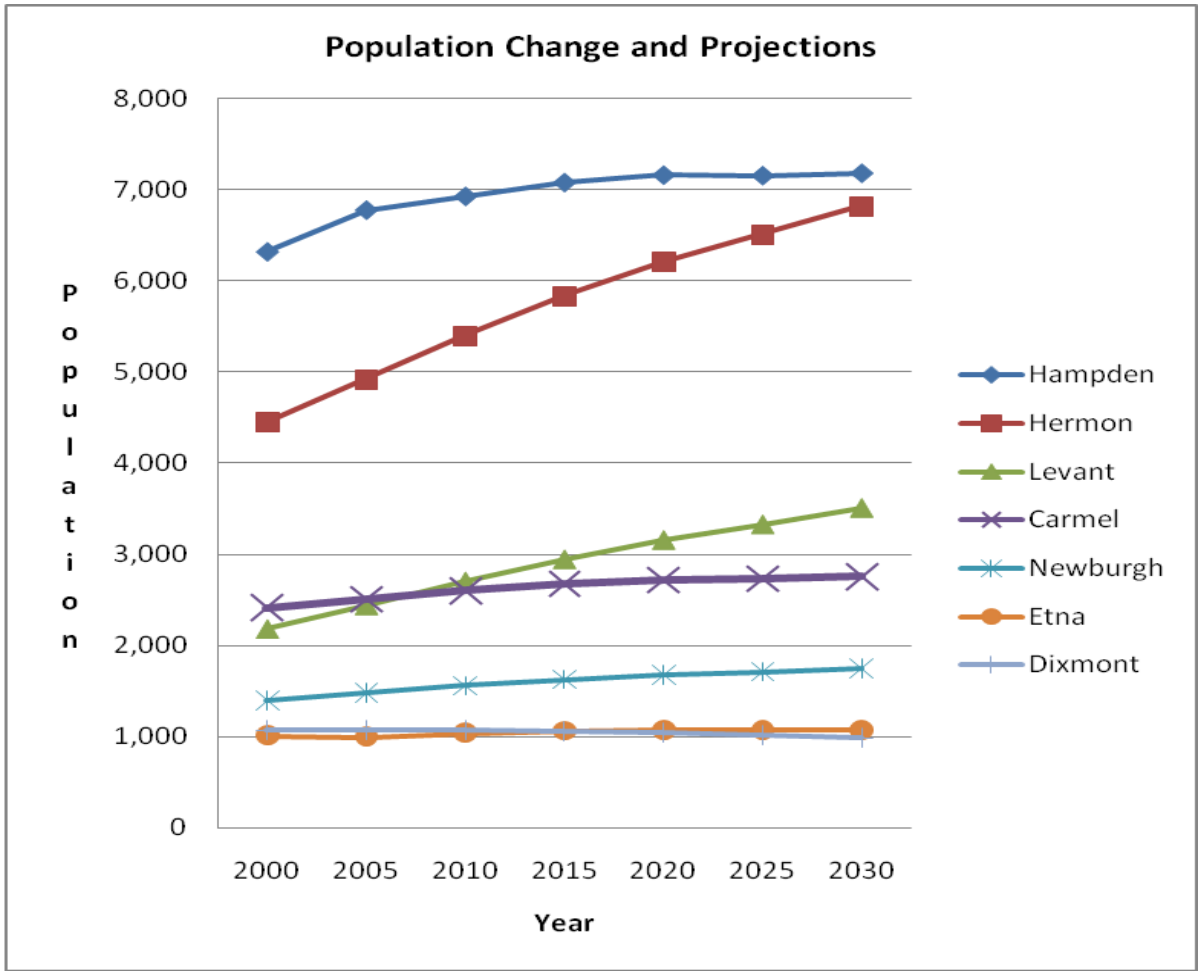
Carmel's population is projected to grow by 156 people, or by 6% between 2010 and 2030. This rate of growth is less than statewide (7.8%), but higher than countywide (2.3%).

The projections for the region reflect a common and continuing trend of suburbanization of more rural communities. Bangor's population is projected to decrease by 14.2%. Hampden, which is already very suburban, is projected to experience very modest growth (3.6%). The fast growth communities, Hermon (26.3% projected growth) and Levant (29.9% projected growth) are those rural-suburban communities closest to Bangor where affordable rural land is still available within commuting distance of Bangor.

(See Table 1-2 and Figure 1-2 on next page.)

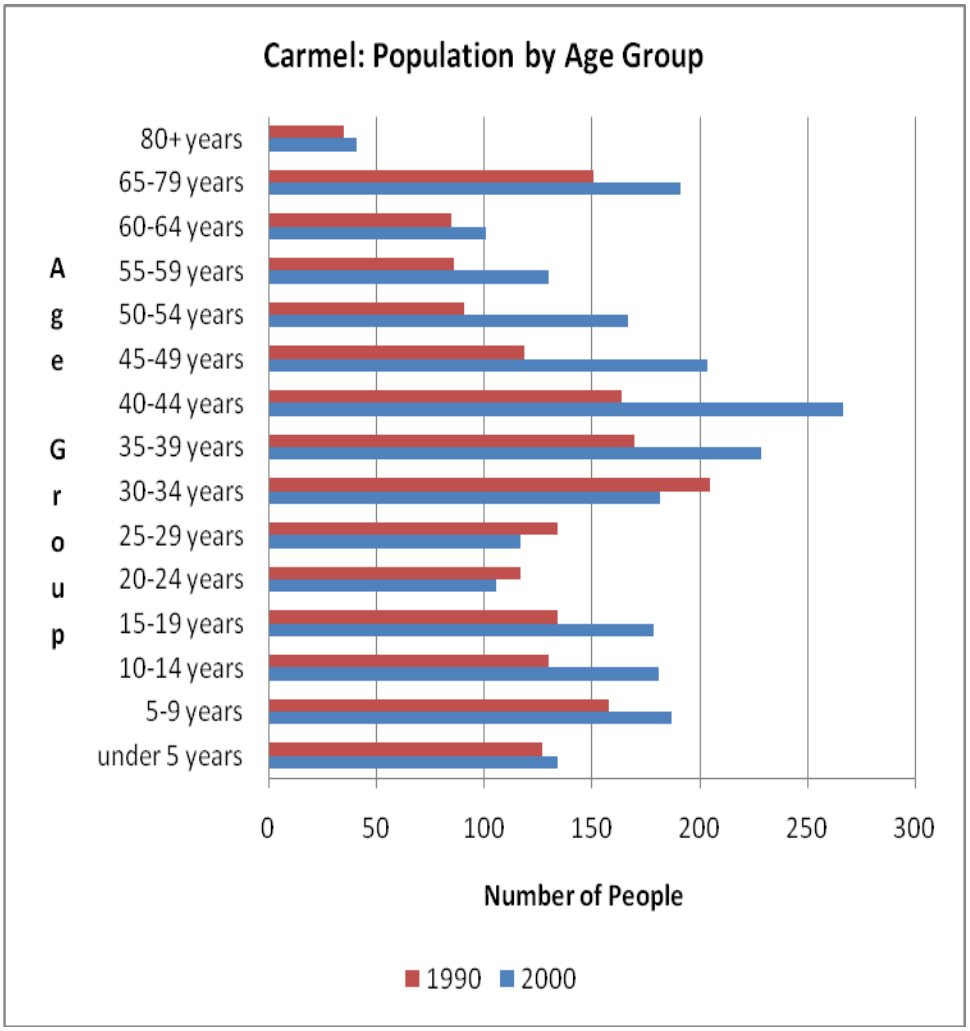
Table 1-2. Population Projections							
	2010	2015	2020	2025	2030	#	%
Hampden	6,922	7,073	7,153	7,148	7,173	251	3.6%
Hermon	5,398	5,833	6,210	6,505	6,820	1,422	26.3%
Levant	2,699	2,942	3,155	3,327	3,507	808	29.9%
Carmel	2,603	2,676	2,722	2,735	2,759	156	6.0%
Newburgh	1,555	1,624	1,676	1,707	1,744	189	12.2%
Etna	1,039	1,060	1,071	1,068	1,071	32	3.1%
Dixmont	1,070	1,061	1,042	1,012	986	-84	-7.9%
Bangor	30,623	29,875	28,832	27,472	26,270	-4,353	-14.2%
Penobscot County	144,882	147,068	148,770	149,211	148,172	3,290	2.3%
Maine	1,362,938	1,401,553	1,434,404	1,458,016	1,469,211	106,273	7.8%
Source: Maine State Planning Office, February 2008							

Figure 1-2, U.S. Census



Age Characteristics

Figure 1-3. Source: U.S. Census



Carmel's population grew by 510 people during the 1990s. Nearly 75% of this population growth was the result of in-migration. The data displayed in Figure 1-3 suggests that many of those who moved into town were middle age (age 40 to 60) with some having children.

There also appears to have been a significant increase in people over age 65, some perhaps moving to Carmel to retire.

Carmel lost population in the young adult age groups (age 20 to 35), which mirrors statewide trends. Young adults may be leaving to attend college or graduate school, to find employment, to live in more urban areas, or to just live elsewhere.

Population Projections by Age

State population projections by age group are not available for Carmel[5]. However, some conclusions can be made using the available data.

Carmel's population will continue to be older overall based on current demographics and recent trends. The continued loss of young adults will be a significant contributing factor. Further, as the population increases in age, birth rates decrease and mortality increases. While there may continue to be people moving into Carmel in search of a rural setting in which to live, this trend will not be as

[5] Projections by age group are done by the Maine State Planning Office. Penobscot County demographics and projections do not appear to be similar enough to those of Carmel to use for this analysis. For example, the county is projected to lose 600 people between 2010 and 2020.

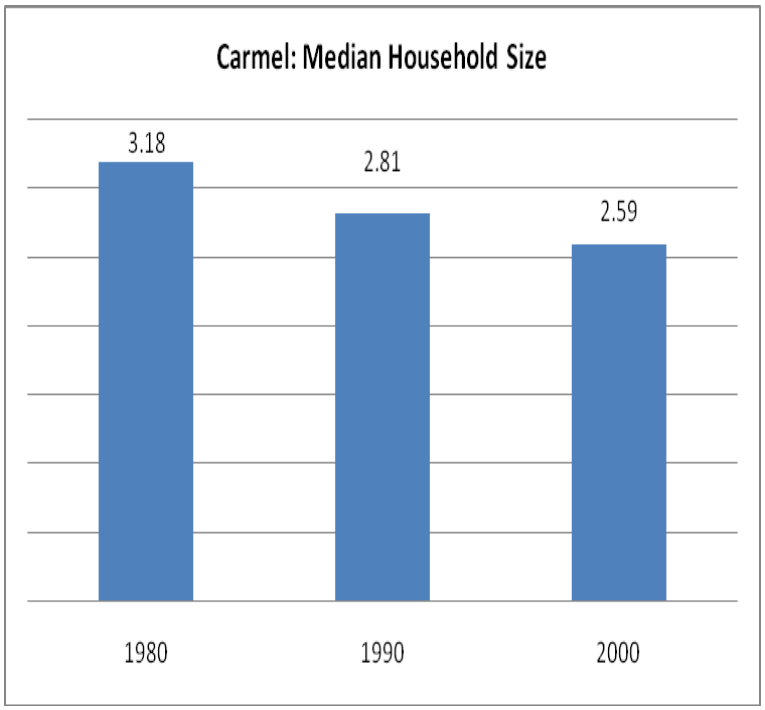
significant as it was during the 1990s. These conclusions are consistent with the slow population growth that is projected for the next decade and beyond.

Seasonal Population

Seasonal residents are a relatively minor component of the population in Carmel. Seasonal dwellings accounted for only 2% of Carmel's housing units according to the 2000 Census. There are no licensed lodging rooms, although there are about 50 licensed campground sites. In some towns, the number of licensed restaurant seats may also serve as an indicator of seasonal activity. There are 60 licensed restaurant seats in Carmel. In general, it does not appear that Carmel has a significant seasonal population.

Household Size

Figure 1-4. Source: U.S. Census



Household size (persons per household) decreased from 3.18 persons per household in 1980 to 2.59 persons per household in 2000. Decreasing household size is a national trend that reflects demographic trends, such as an increase in the number of older people living alone, divorced or separated couples living independently, and children postponing marriage and setting up their own households, rather than living with their families.

One of the most significant implications of the decreasing household size is the need for more, and perhaps smaller, homes for the same size population. Smaller household size also has implications for transportation and the delivery of services. Household size will be used to project the number of housing units needed in the future in Chapter 3 Housing.

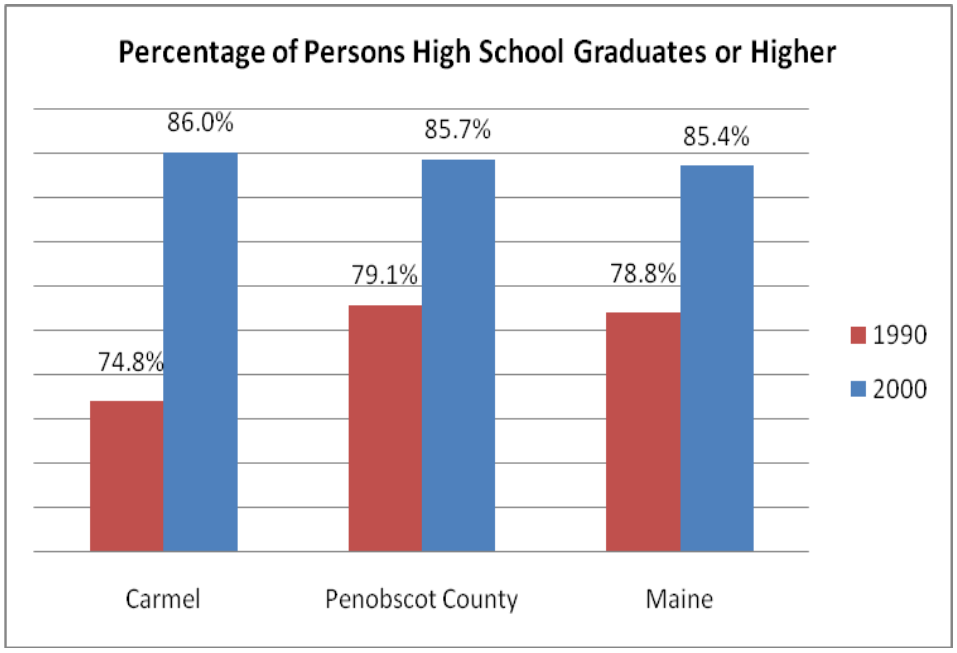
Educational Attainment

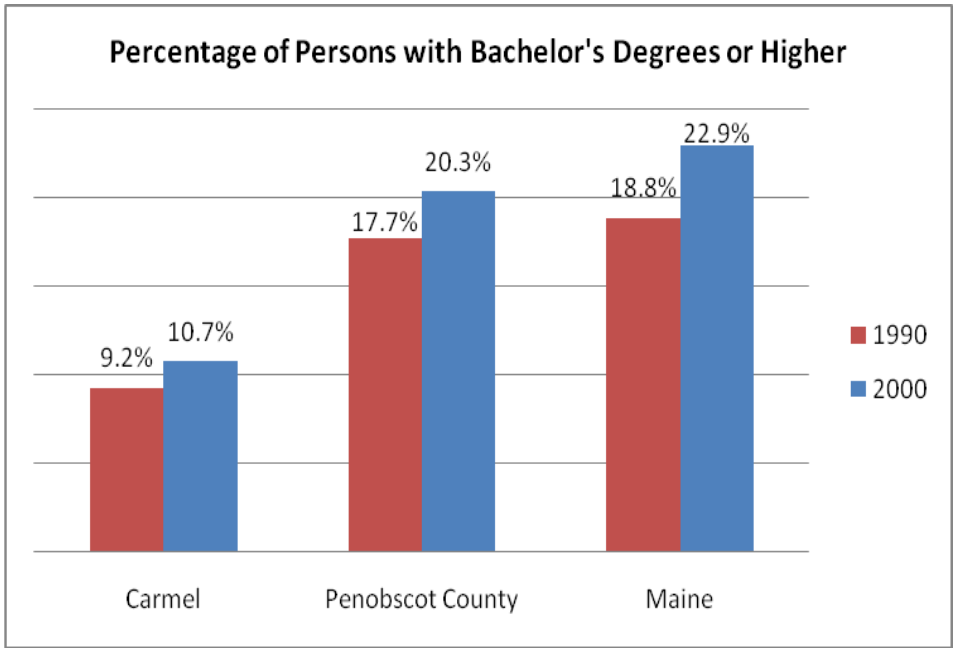
Figures 1-5 and 1-6. Source: U.S. Census

Educational attainment for Carmel residents increased significantly between 1990 and 2000. The percentage of high school graduates increased from 74.8% to 86% of the population age 25 or older during the 1990s. The percentage of Carmel residents with a bachelors degree or higher increased from 9.2% to 10.7% during the 1990s.

There were proportionately less people with a bachelor's degree or higher in Carmel than countywide or statewide for both 1990 and 2000.

Education attainment is a good predictor of the economic success of an individual.



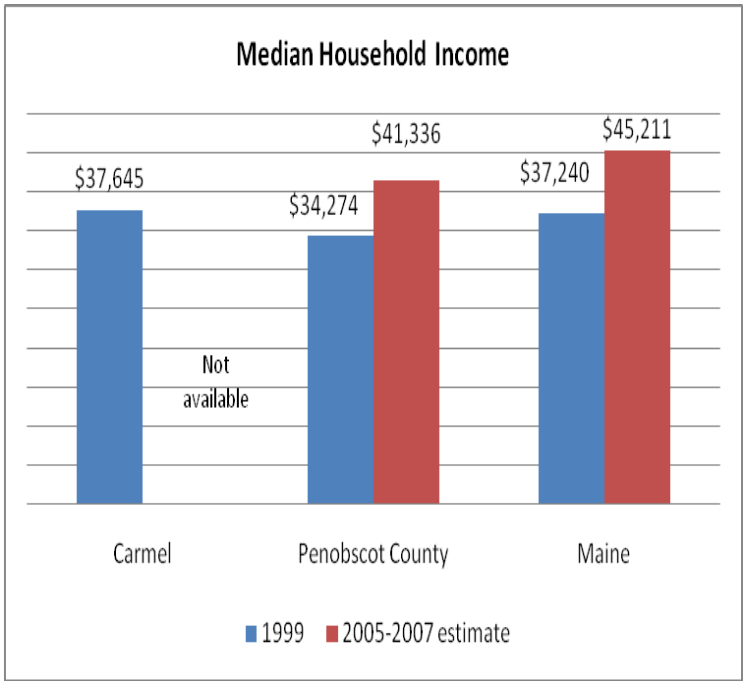


Income

Figures 1-7 and 1-8. Source: U.S. Census

Carmel's median[6] household income for the 2000 Census was $37,645, which was higher than countywide and statewide.

A 20% to 21% increase in the median household income was estimated for the county and state, respectively. Carmel's estimated median income would be $45,550, assuming that the rate of increase was 21%.

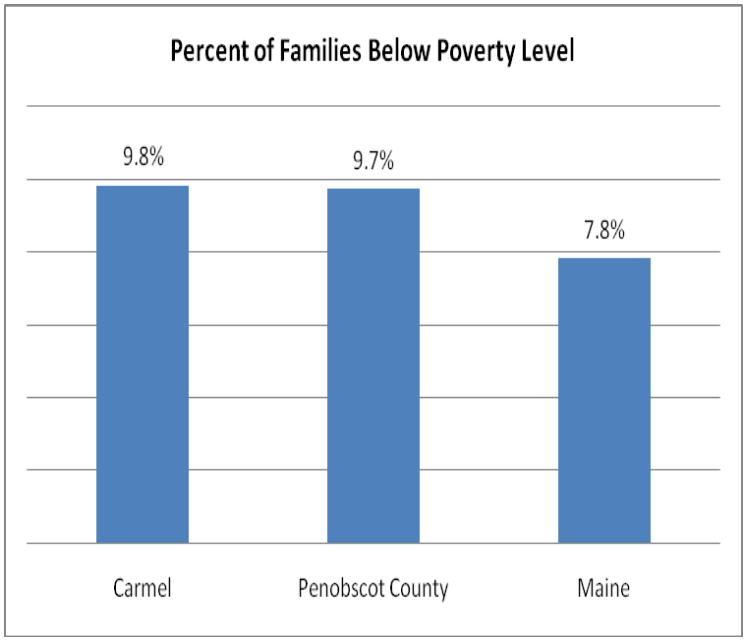


Poverty[7]

About 9.8% of families in Carmel were living below the poverty level according to the 2000 Census. This was higher than poverty levels for families countywide (9.7%) and statewide (7.8%).

Poverty levels in Carmel were highest for the following types of families (2000 Census sample):

- female householder, no husband present with related children under 5 yrs - 100%
- female householder, no husband present with related children under 18 yrs - 40.7%
- female householder, no husband present - 38.6%



[6] *Note: "median" means that half of all households had incomes above the figure listed and half had incomes below the figure listed.*

[7] *Notes: "Family" includes householder and one or more people in the household that are related by birth, marriage or adoption. "Related children" include all people under age 18 related to the householder, regardless of their marital status. Excluded are spouses of householders.*

CHAPTER 2. ECONOMY

Overview

The future prosperity of Carmel is highly dependent on job opportunities and the overall health of the regional economy. A town is better able to successfully plan for future prosperity if it understands the long-term economic trends that are affecting the community and region. This chapter examines these issues and others.

Global and State Perspective

Globalization, technology and demographics are the primary factors driving the economy today. These are the long-term "structural" economic trends that are most important to comprehensive planning. These forces are resulting in fundamental changes, such as the shift away from manufacturing and towards a more service-oriented economy. The most significant demographic trend affecting the economy is the aging population and the impending retirements of baby boomers, which will profoundly impact labor markets and reshape long standing patterns of demand for goods and services.

Cyclical changes, such as periods of growth and recession, are less important to comprehensive planning because they are usually temporary changes that do not affect the long-term structure of the economy. Nevertheless, the current downturn in the economy is having a very significant impact at all levels of government and slow economic recovery is anticipated.

LONGER TERM STRUCTURAL CHANGES

Long term economic trends are summarized below[8]:

- **Globalization** – The service–producing sector has accounted for most job growth for decades. The manufacturing sector has been steadily losing jobs. Both of these trends are projected to continue. Globalization is the primary force behind this change.
- **Technological Changes** – Coupled with globalization, technology continues to shape the economy, with the pace of technological change expected to accelerate. Changes in technology have increased the demands for skilled workers. Across the spectrum of Maine workplaces, more is being demanded of workers in terms of knowledge, skills, and abilities required for job performance. Increasingly, Maine's competitiveness is determined by the quality and availability of human capital.
- **Innovation** – As several studies have recently pointed out, innovation is a necessity to succeed in the new economy. Much of the growth will have to come from entrepreneurship and initiative of Maine's smaller businesses, and entrepreneurial startups.
- **Support of the creative economy** has also been a focal point of recent economic development efforts. The creative workforce may be employed within the creative clusters of industries, in an industry outside the creative cluster, or they may be self-employed. The creative workforce is com-

[8] *Maine Department of Labor*

posed of individuals whose jobs require a high level of skill in the cultural, fine, or applied arts, such as film, textiles and boatbuilding.

- **Employment opportunities will be concentrated in service-providing industries**. Education and health services, retail trade, and leisure and hospitality services are expected to create about three-quarters of all jobs. Many of the fastest growing occupations will be healthcare-related occupations largely due to rapid growth in the number of middle age and elderly people.

SUMMARY

Where does the local population work and how does the community fit into the economic region (labor market area)?

Carmel is predominately a bedroom community to the greater Bangor urban area. About 61% of Carmel's residents commuted to the greater Bangor urban area according to the 2000 Census. Fourteen percent Carmel's employed residents worked in Carmel. Nearly all of the remaining 25% of Carmel's residents worked in other areas of Maine.

Carmel's employers, such as the school district, contractors and other businesses, provided 388 jobs according to the 2000 Census. Forty-five percent of these jobs were held by Carmel residents. Fifty-five percent of these jobs were held by people from other towns.

Who are major employers in the region and what is their outlook for the future?

There is a broad and diverse economic base in the region that includes hospitals and other health and social service agencies, schools and universities, major retail and wholesale businesses, supermarkets, financial institutions and services, manufacturers, and state, county and local governments. This diversity of the employers makes the region stronger and less susceptible to economic declines. The Committee does not anticipate any major changes in the future.

Is the economy experiencing significant change, and how does this, or might this, affect the local population, employment and municipal tax base?

Carmel's local economy is highly dependent upon the region's economy, which is increasingly affected by national and global trends, including the shift from a manufacturing to a service sector economy and technological innovations and the need for a skilled workforce. Demographic changes, including the loss of traditional working age people and the needs of the aging population, are also factors. Future prosperity will be contingent on the ability of the private and public sectors to adapt and take advantage of these changes. The Committee does not anticipate any major changes in the future.

What are the community's priorities for economic development? Are these priorities reflected in regional economic development plans?

Carmel is a small rural bedroom community that does not have the capacity to undertake a formal economic development program, or be actively involved in regional programs. Carmel's efforts to support local businesses include advertisements in the newsletter and on the Town's WEB page.

If there is a traditional downtown in the community, is it deteriorating or thriving? How is this affecting the community?

Carmel has a small village that consists of public buildings, such as the town office and post office, a few businesses, and several residential neighborhoods. The village is a thriving area that functions as the social and civic center of the community. The major constraint to further development is the lack of public water and/or sewer.

Are natural resource-based industries (including fishing, farming, or forestry) important in the community and, if so, are they growing or declining? What steps has the community taken to support these industries?

Commercial forestry and traditional agriculture are no longer a significant part of the local economy. Commercial forestry consists of small woodlot owners utilizing wood lots for personal use and occasionally selling wood products commercially. Agriculture consists primarily of activities for personal use and several horse farms. The Town wishes to support agriculture and forestry activities.

Is tourism an important part of the local economy? If so, does the community want to foster this industry and what steps can it take to strengthen tourism?

Carmel is not known as a tourist community. However, there are businesses that cater to tourists, including the campground, general stores, several restaurants and gift shops in town. Many of these businesses are located along Route 2, which is a major east-west corridor. A regional effort to encourage tourism along this corridor might be a way to strengthen tourism.

What role do/should home occupations play in the community, if any?

As a rural community, home occupations are an important part of Carmel. In some cases businesses have started out as home occupations, and then expanded into separate businesses.

Are there appropriate areas within the community for industrial or commercial development? If so, are performance standards necessary to assure that industrial and commercial development is compatible with the surrounding land uses and landscape?

The Town allows a variety of commercial activities in its Commercial Zone. The Land Use Ordinance contains standards pertaining to minimum lot size (2 acres), frontage and setbacks, and some road design and signage standards. There are no specific performance standards that address noise, traffic, storage of materials, buffers between uses, etc. However, the ordinance does prohibit uses that would be "injurious, noxious, or offensive to a neighborhood by reason of the emission of odor, fumes, dust, smoke, vibration, noise or other cause…."

What types of public facilities, including sewer, water, broadband access or three-phase power, are needed to support the projected location, type, and amount of economic activity, and what are the issues involved in providing them?

Carmel's economic assets include easy access to major transportation corridors (Interstate 95 and Route 2), and the Central Maine Railroad. There are no rail sidings in Carmel at this time. Three phase power is available. High speed internet is available in some locations in Town. Carmel does not have centralized public sewer or water, which may constrain some types of economic activity. Carmel does not have an industrial park. An industrial park to be located near the Interstate was proposed several years ago, but the proposal was defeated at Town Meeting.

SUPPORTING DOCUMENTATION

A Brief Historical Perspective

The area known as Carmel was first settled in 1798. It was an attractive area for settlement with abundant water, generally level land, large tracts of alluvial land along streams, and a dense growth of pine timber. Early landowners primarily logged their property to support themselves and their families.

As time progressed, Carmel increasingly became a farming community. The years from 1840-1880 were a prosperous period. Dairies, sawmills, and livery stables were located in town. By horse and cart, Carmel was one day's travel to Bangor (six miles from boundary to boundary) on a major route. The village area had as many as three hotels at one time, and many other businesses. The railroad also had a major role in the economy, in that bustling, self sufficient community.

As the turn of the century approached, Carmel, like many small communities, was changed by the combination of industrialization and the appearance of the automobile. The general trend of the population to give up farming and seek employment in urban areas, coupled with national events such as World War I and the Depression, left Carmel a struggling bedroom community. The advent of the automobile, Carmel was simply a village to drive through, and the attention of the railroad shifted to transporting goods to and from urban areas.

Carmel began to grow again around 1940 with residents commuting to Bangor and the surrounding metropolitan area. Today, Carmel is a thriving bedroom community with a small commercial sector.

Regional Economy and Economic Development Efforts

Carmel is within the greater Bangor Metropolitan Area[9]. Bangor, Brewer and the surrounding urban communities provide a broad array of goods and services, and are major employment centers for the region. A majority of Carmel's residents work and shop, and utilize the services within these urban centers. Carmel's economic well-being is highly dependent on the economic vitality of these areas.

Further, the region's economic future is dependent upon the global and national trends, and the region's ability to take advantage of those trends. Economic leaders in Maine and the region, including the university system are working to take advantage of the opportunities, such as those related to alternative energy and technological innovation.

The Eastern Maine Development Corporation (EMDC) is the regional economic and business development agency for eastern Maine. EMDC engages various stakeholders (including town officials) in a planning process to develop a comprehensive economic development strategy designed to bring together the public and private sectors in the creation of an economic roadmap to diversify and

[9] *Bangor Metropolitan Area includes: Alton, Amherst, Argyle Township, Aurora, Bangor, Bradford, Bradley, Brewer, Carmel, Charleston, Clifton, Corinth, Dedham, Dixmont, East Central Penobscot unorganized, Eddington, Edinburg, Enfield, Etna, Exeter, Frankfort, Garland, Glenburn, Greenbush, Hampden, Hermon, Holden, Howland, Hudson, Kenduskeag, Lagrange, Levant, Lowell, Maxfield, Milford, Newburg, Newport, Old Town, Orono, Orrington, Passadumkeag, Penobscot Indian, Island Reservation, Plymouth, Stetson, Veazie, and Winterport.*

strengthen the regional economy. Projects outlined in the economic development strategy program are eligible for funding from the U.S Economic Development Agency.

Other regional economic development agencies include: the Greater Bangor Chamber of Commerce, Bangor Region Development Alliance, the Penobscot Valley Council of Governments, and the Bangor Area Comprehensive Transportation System (BACTS)/Metropolitan Planning Organization.

Carmel, being a small town, has not been actively involved in economic development. Many aspects of economic development are outside its control, and the Town is not large enough to support its own economic development staff.

Work Location

There were 1,243 Carmel residents who worked according to the 2000 Census. Fourteen percent of Carmel's working residents worked in Carmel. Nearly 46% of Carmel's working residents worked in Bangor. When added with the other major towns in the Bangor urban area[10] the figure is 61% of Carmel's working population.

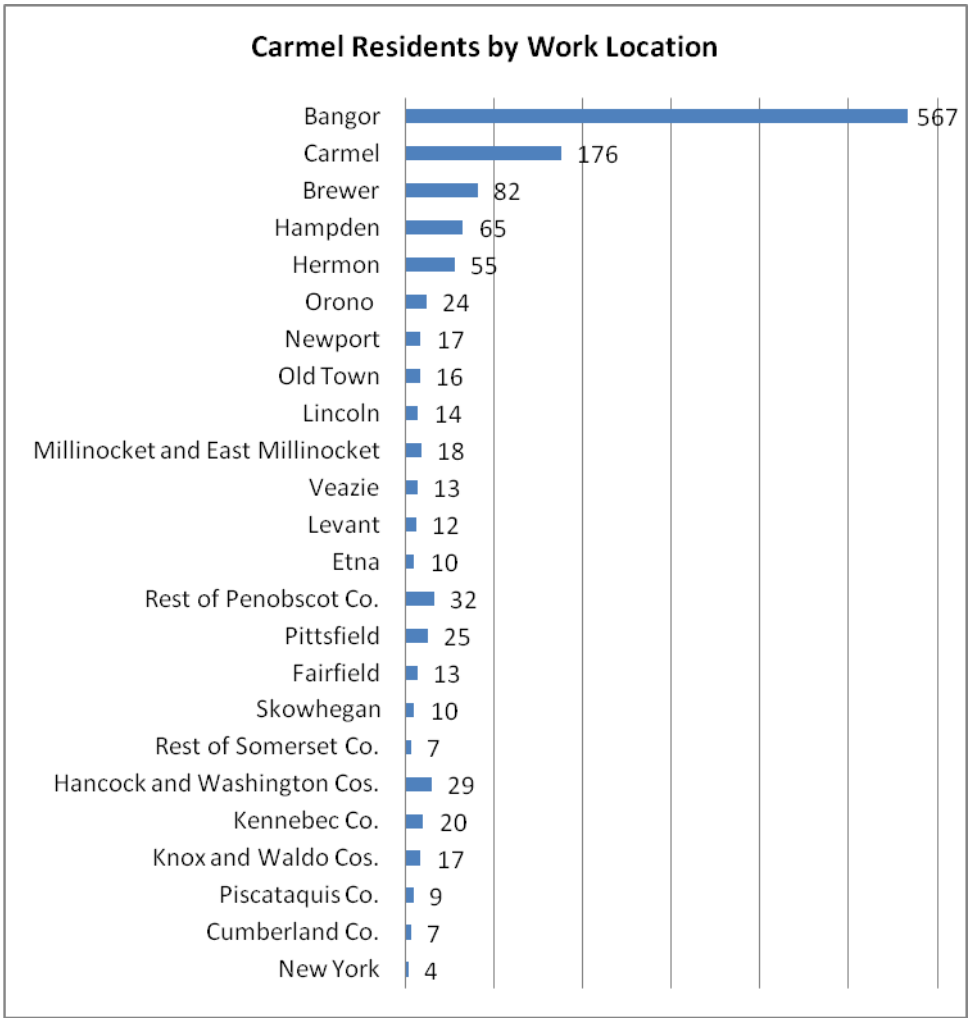


Figure 2-1. Source: 2000 Census

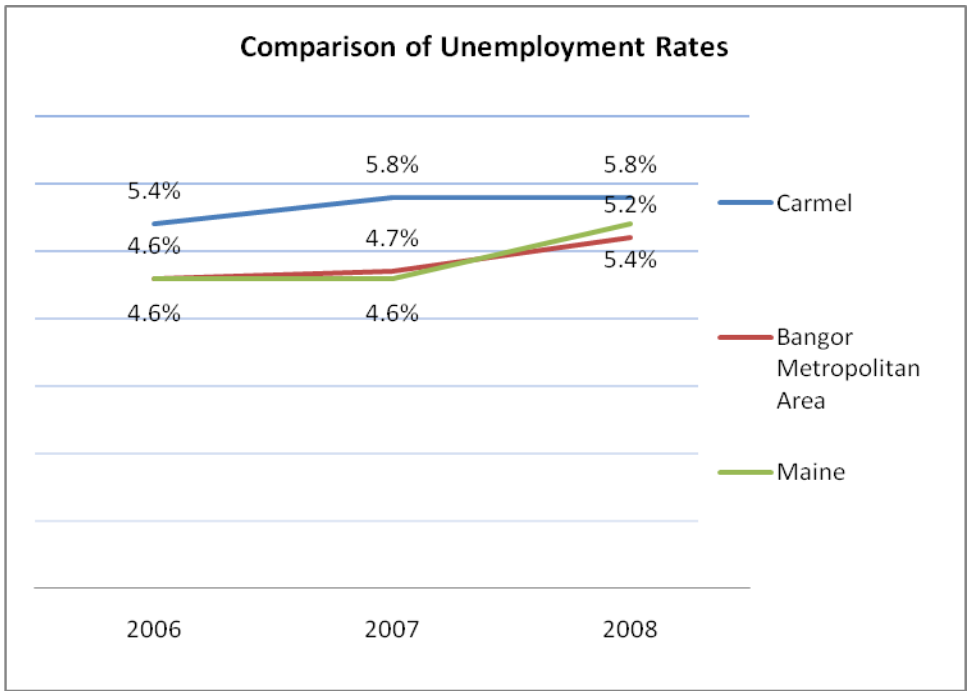
[10] *Bangor, Brewer, Hampden, Hermon, Orono, Old Town, and Veazie*

Labor Force Employment Levels

There were 1,527 Carmel residents in the labor force as of 2008. About 5.8% of these people were unemployed, and looking for work.

Table 2-1. Carmel's Labor Force in 2008			
Labor Force	Employed	Unemployed	Unemployment Rate
1,527	1,439	88	5.8%
Source: Maine Department of Labor			

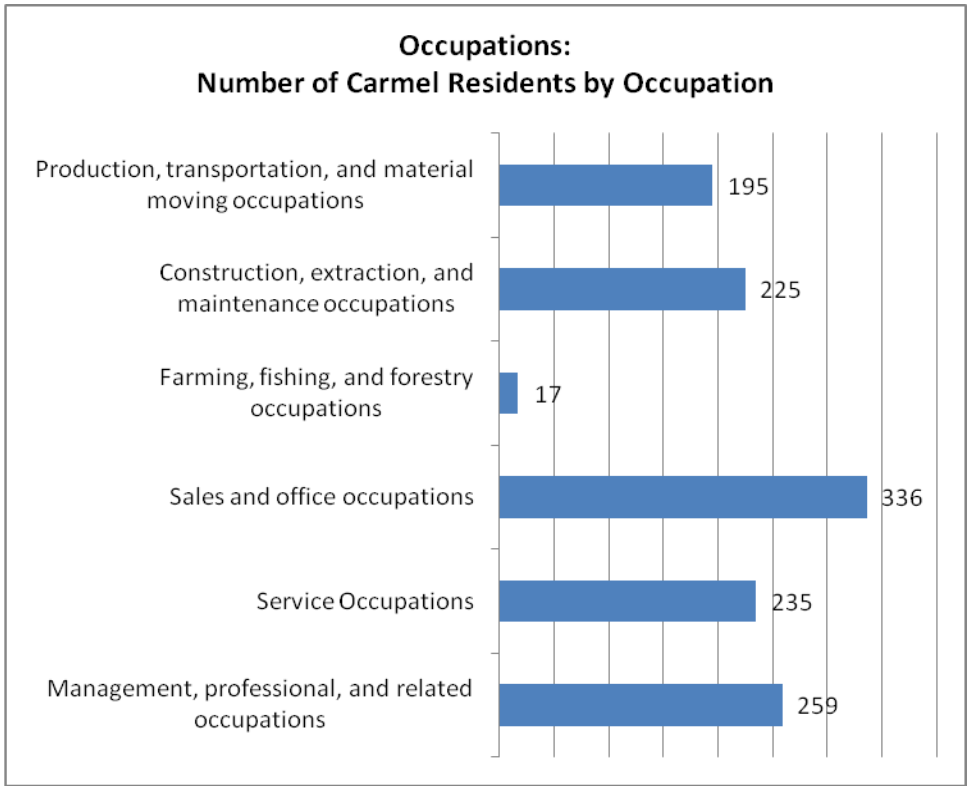
Figure 2-2. Source: Maine Department of Labor



Unemployment rates in Carmel have been consistently higher than unemployment rates for the Bangor Metropolitan Area and Maine. More rural, sparsely populated areas tend to have higher unemployment rates than suburban and urban areas.

Occupational Profile

Figure 2-3. Source: U.S. Census

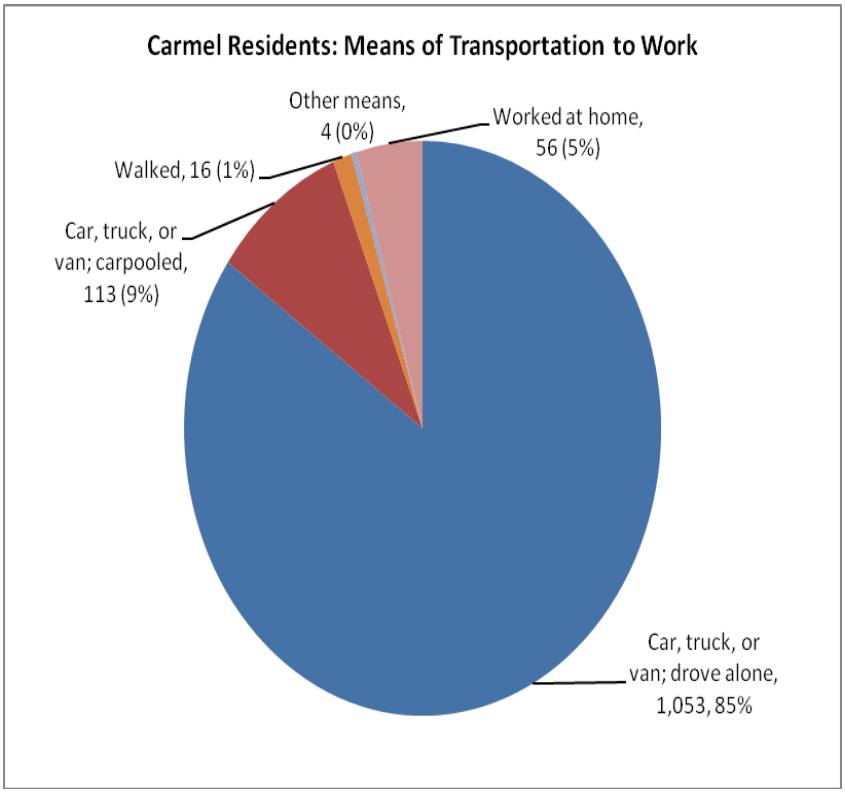


The occupational profile for Carmel residents is typical of a bedroom community. Carmel residents have access to a variety of occupations within the Bangor metropolitan area. Many people have occupations in the sales, service, management and professional categories. Very few people are involved in farming or forestry which is typical of communities today. This diversity of occupations makes the community stronger, and less susceptible to economic declines,

particularly those affecting specific sectors such as manufacturing.

Commuting to Work

Figures 2-4 and 2-5. Source: 2000 Census

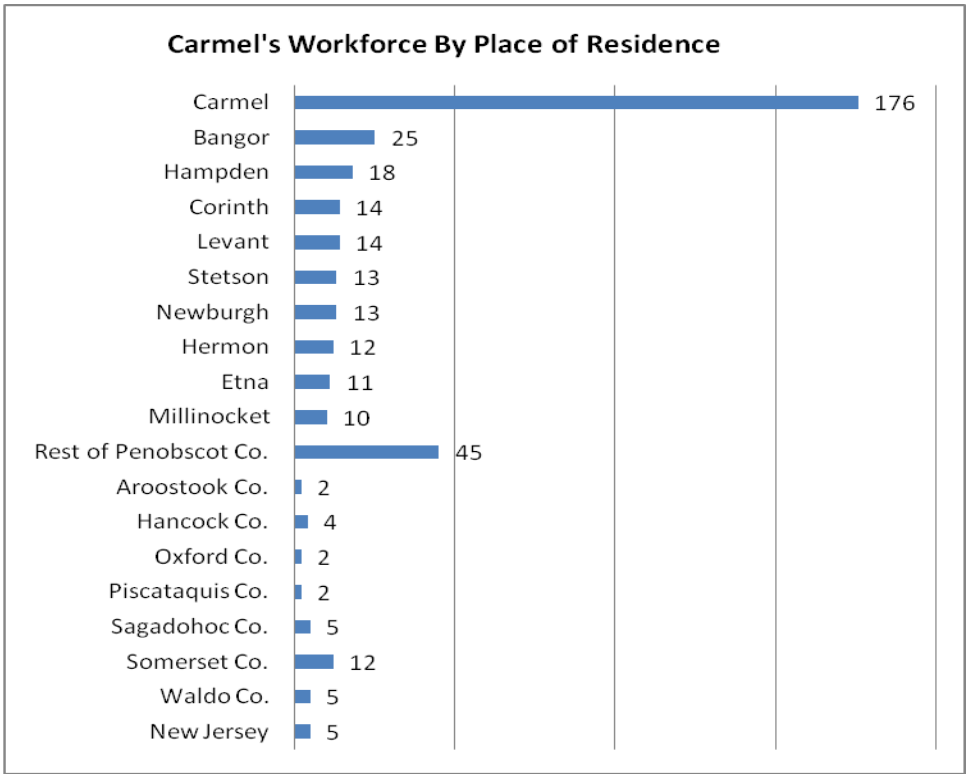


Carmel residents appear to be commuting further today than in the past according to Census data. The average commute time increased from 24.2 minutes in 1990 to 27.5 minutes in 2000.

Most people (85%) were driving to work alone (Figure 2-4). Only 9% carpooled. About 1% walked to work, and 5% worked at home. No one used a motorcycle or a bicycle for commuting. Commuting in the future may change if the cost of commuting increases dramatically due to increased cost for fuel. More people may telecommute from home, carpool, walk, and bicycle or use a motorcycle. Some people may choose to live closer to their place of employment.

Work Force by Place of Residence

A total of 388 people worked in Carmel according to the 2000 Census (Figure 2-5). Forty-five percent or 176 of these individuals resided in Carmel and worked in Carmel. The remaining 55% of Carmel's workforce lived outside of town. About 45% of those commuting to Carmel lived in Penobscot County.



Inventory of Employers and Businesses in Carmel

The following inventory of employers obtained from the Maine Department of Labor includes businesses, non-profits, and public agencies. The school district is the largest employer in the town. The Acadia Auction Gallery is the next largest employer. Other employers include contractors (mostly construction trades), public and semi-public entities, and service sector businesses. Most other employers have fewer than 20 employees.

Table 2-2. Inventory of Businesses and Employers

Company Name	Road/Street	Type Business	# Employees
AA Quality Home Improvements	Hampden Rd	Home improvement contractor	1-4
AAA Rainbow Cleaning Systems			1-4
Acadia Auction Gallery	Murray Rd		50-99
Acadia Auto Auction	Murray Rd		1-4
Acadia Recovery Inc.	Murray Rd		5-9
Alaska To Maine Taxidermy	Marcho Rd	Taxidermy	1-4
Always Creative Catering	Bemis Rd	Catering service	1-4
B & B Pole Line Construction	Fuller Rd	Construction	1-4
Beat Masters Pro Audio	Demmons Lane		1-4
Best Quality Painting	Etna Pond Lane	Painting contractor	1-4
Bio Edge Fishing Products	Dyer Rd		1-4
C A Newcomb and Sons	Main Rd		10-19
Caravel Junior High School	Irish Rd	School	20-49
Carmel Bridge Maintenance Lot	Fuller Rd	MDOT	20-49
Carmel Corn Company	Main Rd		1-4
Carmel Door	Bangor-Newport Rd		1-4
Carmel Elementary School	Plymouth Rd	School	20-49
Carmel Health Center	Main Rd	Health Center	5-9
Carmel Oil Company	Mayhew Way	Oil dealer	1-4
Carmel Snowmobile Club	Hampden Rd	Non-profit recreation	5-9
Carmel Town Manager	Safety Lane	Town government	1-4
Carmel Union Congregational		Church	1-4
Carmel Village Market	Plymouth Rd	General store	5-9
Carmel Well Drilling Company	State Rd	Well drilling contractor	1-4
Cheap Oil Company	Michael Dr	Oil dealer	1-4
Children's Village Child Care	Main Rd	Daycare	10-19
Condon Electric	Main Rd		10-19
Congregational Church	Church St	Church	1-4
Davis Abstracting	Haskell Rd	Abstracting services	1-4

Source: Maine Department of Labor, Carmel Town Office

Table continued on next page…

Table 2-2. Inventory of Businesses and Employers			
Company Name	Road/Street	Type Business	# Employees
D L Small and Sons	Fuller Rd	Building Contractor	
Devlin Diesel Repair	Route 2	Diesel Mechanic	
Discount Towing	Hampden Rd		1-4
Downeast Supervac	Horseback Rd		1-4
Emerson's Plumbing & Heating	Cook Rd		1-4
Excel Electric Inc.	N/A		1-4
G L Clavette Home Construction	Hampden Rd	Home construction contractor	1-4
Generations Styling Salon	Murray Rd	Beauty salon	1-4
Global Pest Service	N/A		1-4
Hair Club	Hampden Rd	Beauty salon	1-4
Hank's Repair	Old State Rd		1-4
HCP Computers Inc.	Fuller Rd		5-9
Highway International	Damascus Rd		1-4
Hyson Painting	Five Rd		1-4
Dicks Mini Mart	Route 2	General store	5-9
L J Storage	Hampden Rd		1-4
Maine Portage	Main Rd		1-4
Mike's Horseshoeing	Demmons Lane	Farrier	1-4
Northern Associates Cleaning	Hampden Rd		1-4
Pomeroy Oil Company	Horseback Rd	Oil dealer	1-4
Potter's Transmission LLC	Main Rd		1-4
Proactive Services	Cook Rd		1-4
Radigan Mechanical	Purple Heart Lane		1-4
Ryder's Commercial Cleaning	Main Rd	Commercial cleaning	1-4
School District	Plymouth Rd	Public school bus garage	1-4
School District	Plymouth Rd	Public school	50-99
Seafood Galley Restaurant	Route 2	Restaurant	10-19
Sebasticook Regional Family	Main Rd	Health center	5-9
Simpson Memorial Library	Plymouth Rd	Public library	1-4
Stepping Stone Farm	Cook Rd	Horse farm	1-4
Triple S Tack Shop	Hampden Rd	Retail	1-4
U-Haul Company	Hampden Rd	Rental	1-4
US Post Office	Main Rd	Post office	5-9
Verizon Wireless	Mountain View Lane	Communications	1-4
Village Creamery	Route 2		1-4
Wayne Elston Speed Shop	Raceway Dr		1-4
Weekend Auto Repair	Bangor Newport Rd	Auto repair & towing	1-4
Witham Paving	N/A	Paving contractor	10-19
WWFS Professional Exterior	Five Rd		1-4
Ye Old General Store	Main Rd	General store	5-9
Source: Maine Department of Labor, Carmel Town Office			

Home Occupations

There are a number of home occupations in Carmel including professional offices, sales, beauty shops, day care and other services. Carmel's Land Use Ordinance allows home occupations to some extent in all districts except where prohibited by shoreland zoning. In the Residential Farming District they are treated as "accessory uses" and include uses such as offices for doctors, architects, beauticians, real estate and insurance agents, and lodging establishments for no more than 4 lodgers. Home occupations are an allowed use in the Commercial District. Home occupations have generally been compatible with adjacent uses, and usually do not become larger businesses.

Agriculture and Forestry

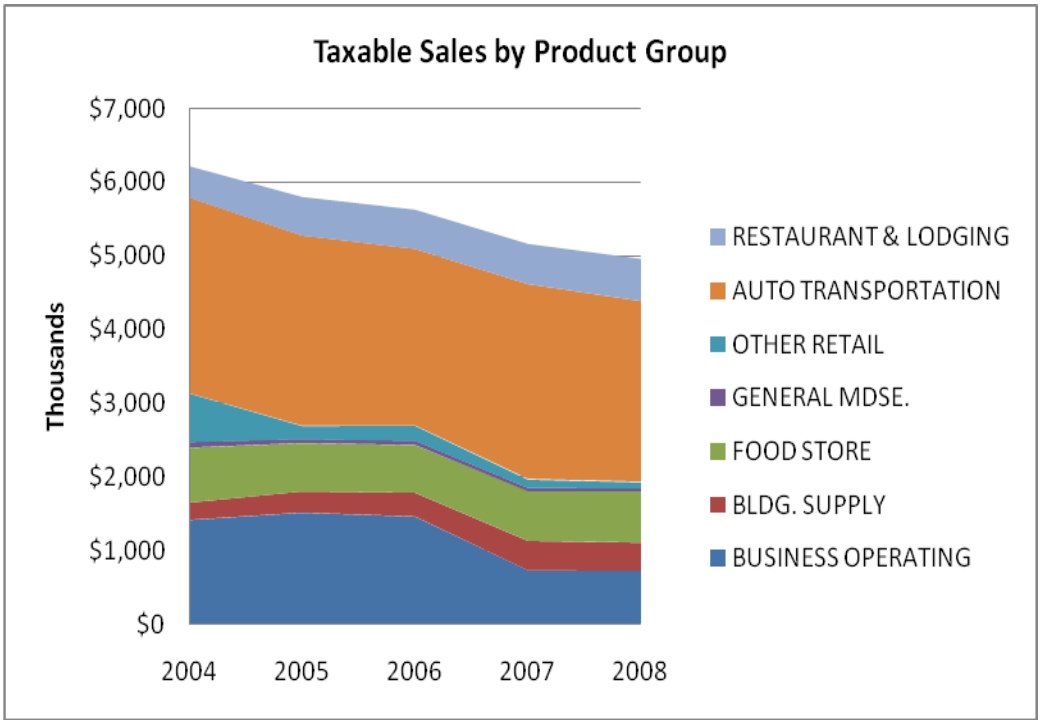
In Carmel there are just a handful of businesses associated with forest products, agriculture, or other natural resources, such as sand and gravel extraction. These activities provide some jobs and/or income to local people. Often, income from forestry and agriculture supplements other sources of income. Woodlot owners derive income from selling forest products, and are fortunate to have a number of mills within a 50-mile radius using a variety of products, such as bark, saw dust, biomass, wood pellets, firewood, boltwood, cedar shingles, hardwood and softwood, pulpwood, studwood, and a variety of softwood and hardwood log grades. In the past, Carmel had a substantial agricultural base. Today, the majority of active agriculture uses are for individual use with a few remaining small livestock operations. There are also several horse farms.

Carmel's Taxable Retail Sales Performance

Taxable retail sales data suggests that there is a considerable amount of business activity in Carmel. Taxable retail sales are those sales where a sales tax is collected, and do not include non-taxable items such as food eaten in the home. Carmel's business sector had a total of nearly $5 million in taxable retail sales in 2008 (Table 2-4 and Figure 2-6). Auto Transportation, with almost $2.5 million in retail sales in 2008, was the store category with the highest amount in retail sales. Total taxable sales declined steadily from about $6.2 million in 2004 to just under $5 million in 2008, similar to the decline statewide, and as a result of the current recession. The only categories that experienced growth in retail sales during this time period were Building Supply and Restaurant and Lodging.

Table 2-4. Carmel: Taxable Sales in Thousands of Dollars by Product Group[11]								
Year	Business Operating	Building Supply	Food Store	General Mdse.	Other Retail	Auto Transportation	Restaurant & Lodging	Total
2004	$1,417.0	$233.5	$748.1	$77.0	$657.5	$2,658.3	$430.6	$6,222.0
2005	$1,517.3	$286.0	$659.1	$52.8	$176.1	$2,583.8	$527.9	$5,803.0
2006	$1,464.7	$320.4	$649.7	$57.5	$202.9	$2,396.7	$536.5	$5,628.4
2007	$730.3	$399.5	$680.8	$47.8	$110.5	$2,644.4	$548.9	$5,162.2
2008	$720.7	$384.3	$705.5	$39.0	$83.1	$2,449.2	$576.1	$4,957.9
Source: Maine Revenue Services								

Figure 2-6. Source: Maine Revenue Services



[11] *Key to Product Group Categories:*

Business Operating includes special types of sales and rentals to businesses where the tax is paid directly by the buyer, such as commercial or industrial heating oil purchases.

Building Supply includes durable equipment sales, contractors' sales, hardware stores and lumber yards.

Food Stores including large supermarkets to small corner food stores (snacks and non-food items only)

General Merchandise includes stores carrying products generally carried in large department stores (clothing, furniture, shoes, radio-TV., household durable goods, home furnishings, etc.)

Other Retail includes a wide selection of taxable sales not covered elsewhere (dry goods stores, drug stores, jewelry stores, sporting goods stores, antique dealers, gift shops, etc.)

Auto includes all transportation related retail outlets (auto dealers, auto parts, auto rental, etc.)

Restaurant/Lodging includes stores selling prepared food for immediate consumption. Lodging includes only rentals tax.

Major Employers

Table 2-3 displays a listing of employers in the Bangor Metropolitan Area than have more than 250 employees. There is a broad and diverse economic base in the region that includes hospitals and other health and social service agencies, schools and universities, major retail and wholesale businesses, supermarkets, financial institutions and services, manufacturers, and state, county and local governments. Carmel residents are fortunate to be within commuting distance of such as variety of job opportunities.

Table 2-3. Major Employers: More Than 250 Employees

Company Name	City or Town
Acadia Hospital	Bangor
Air Nation Guard	Bangor
Bangor Intl Airport	Bangor
Bangor Publishing Co	Bangor
Bangor Savings Bank	Bangor
Community Health and Counseling	Bangor
Dorothea Psychiatric Center	Bangor
Dysart's Transportation Inc	Hermon
Eastern Maine Healthcare Systems	Brewer
Eastern Maine Medical Center	Bangor
GE Energy	Bangor
Hartt Transportation Systems	Bangor
Maine Human Services Dept	Bangor
Johnson Outdoors Watercraft	Old Town
L-3 Microdyne Outsourcing	Orono
Penquis	Bangor
Quirk Mitsubishi	Bangor
St Joseph Hospital	Bangor
University Of Maine	Orono
University Of Maine	Orono
Wal-Mart	Bangor
Wal-Mart Supercenter	Brewer
Weekly	Bangor
YMCA	Bangor
Zf-Lemforder Corp	Brewer

Source: Maine Department of Labor

CHAPTER 3. HOUSING

Overview

Housing is perhaps the most basic of human needs. As such, it is a centerpiece of planning for the future well-being of the community. This chapter examines Carmel's housing stock, and provides the information necessary to help the Town determine how best to encourage and promote affordable, decent housing opportunities for all its citizens.

State and Regional Perspective

The most significant trends in Maine's housing relate to the growth in the number homes despite slow population growth, and the fact that housing costs are increasing faster than incomes. There has been a significant increase in the number of new housing units over the past decade even though there has been relatively slow population growth. Several reasons for this phenomenon include: (1) fewer people per household resulting in the need for more housing units; (2) people upgrading by building new homes or buying manufactured housing, (3) people building second homes for seasonal use, and (4) investors purchasing homes and land as an alternative to investing in the stock market.

The demand for new housing has been a major factor affecting the affordability of housing. Housing was still generally affordable in many parts of Maine during the 1990s. Since then housing has become less affordable, as a result of the increasing demand for housing as described above and the in-migration of more affluent people seeking year-round or second homes. Property values have increased significantly as a result. First-time homebuyers, seniors on fixed incomes, and lower income residents have been the hardest hit by the increasing cost of housing. Middle income families are also struggling to find affordable housing in many areas of the state.

Carmel and the Bangor Housing Market Area have been less affected by these trends than other high growth areas of the state, such as southern Maine and coastal communities. However, the greater Bangor area has also experienced the trend towards sprawl with people choosing to live in more suburban and rural areas and commuting to the urban areas for work.

One unknown with respect to sprawl and where people choose to live is the price of fuel and the cost of commuting. If fuel prices increase dramatically over the long term, people may have to live closer to their employment and services just to keep the cost of commuting in check.

SUMMARY

How many additional housing units, including rental units, will be necessary to accommodate projected population and demographic changes during the planning period?

Carmel's population is projected to increase by about 120 people between 2010 and 2020[12]. Assuming an average household size of 2.4[13], this would mean a total of 50 to 60 additional households, or housing units. At least 6 of these units would be rental units.[14]

Is housing, including rental housing, affordable to those earning the median income in the region? Is housing affordable to those earning 80% of the median income? If not, evaluate local and regional efforts to address issue.

Carmel's median household income was $47,756 in 2008 according to the Maine State Housing Authority (MSHA). Homeownership in Carmel is considered "affordable" according to the MSHA. Homeownership in the Bangor Housing Market Area is considered "less affordable". About 12% of Carmel's housing is rental housing. Rental housing is more affordable in Carmel than in the Bangor Housing Market Area.

Some low income households may be having a difficult time affording housing in Carmel. Carmel had about 398 low income households, which is 38% of all households, according to the MSHA. These households had incomes of less than $38,205, which is less than 80% of the median household income. MSHA determined in 2008 that there was a need for 29 more affordable family rental units in Carmel and an additional 12 affordable units for seniors (age 65 and over).

Carmel, as a small rural community without centralized sewer and water, is limited in what it can do to promote affordable housing. The Town can assure that local land use regulations do not unnecessarily constrain the development of appropriate affordable housing options, such as accessory apartments, mobile homes, and clustered subdivisions. Carmel will want to monitor regional attempts to address affordable housing, particularly subsidized housing in more urban and suburban communities.

Are seasonal homes being converted to year-round use or vice-versa? What impact does this have on the community?

There is very little seasonal housing in Carmel and very few conversions, so it does not have much of an impact on the community.

Will additional senior or assisted living housing be necessary to meet projected needs for the community and region? Will these needs be met locally or regionally?

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[12] *Maine State Planning Office Projections, 2008*

[13] *Maine State Housing Authority estimated an average household size of 2.48, suggesting that household sizes are expected to continue to decrease in size. For the purpose of this estimate, we use 2.4 for 2020.*

[14] *About 12% of occupied housing was rental housing for the 2000 Census.*

In general, the needs for senior and assisted living housing would be better met by more urban and suburban communities with the infrastructure and capacity, including administrative capacity, to promote and support this type of housing. Senior and assisted living facilities should also be located closer to goods and services, including health care and social services. Carmel should monitor the senior and assisted living needs of its citizens, and assure that it is supporting these needs to the extent it is capable of doing. For example, the town's land use regulations could allow accessory apartments for grandparents.

Are there other major housing issues, such as substandard housing?

Perhaps the most significant issue for Carmel is the small house lots in the village with substandard on-site waste water disposal systems. This has been an ongoing issue.

Overall Carmel's housing stock appears to be newer than countywide or statewide. However, Carmel has double or more the proportion of mobile homes, which may be serving as the affordable housing option of choice for residents. The MSHA calculated that Carmel had about 398 low income households, which is 38% of all households. This suggests that some people may not be able to afford necessary home improvements. Carmel could direct low income families to housing assistance program available through the Maine State Housing Authority, Penquis and the Maine Department of Environmental Protection (septic system upgrades).

Do existing regulations encourage or discourage development of affordable housing?

Carmel's existing zoning ordinance and subdivision regulations allow a range of affordable housing options, including mobile homes, mobile home parks and clustered subdivisions. There are a number of amendments that could be made to allow more affordable housing options, as are described in this chapter. At a minimum the provisions governing mobile home parks should be updated to be consistent with state statute.

SUPPORTING DOCUMENTATION

Housing Count for 2009

The U.S. Census estimated there are about 1,270[15] housing units in Carmel, of which about 312 are mobile homes. Most of the homes in Carmel are year-round single family homes. Multi-familt units include two 4-unit apartment buildings and one 4-unit condominium. There are two mobile home parks - South Slope Estates Mobile Home Park (35 units) on Hampden Road and Grandeur Mobile Home Estates (40 units) on Dottie's Way.

A total of 305 new homes have been added to the Town's housing stock since 2000. Almost 40% of these new homes were mobile homes. About ten of these new units were seasonal lakefront and/or hunting camps, according to the Code Enforcement Officer.

[15] *U.S. Census American Community Survey Five-Year Estimate (2005-2009)*

Housing Tenure, Occupancy and Vacancy Status[16]

Carmel had 995 housing units for the 2000 Census. Almost 94% of Carmel's housing was occupied year-round (Table 3-1). Only 2% was seasonal, recreational or housing that was used occasionally, and 5% was vacant. Vacant units were those that were for sale, for rent, or otherwise unoccupied.

During the 1990s the total number of housing units increased by 260 units. The proportion of year round units increased from 92% to 94% of all housing units. The proportion of seasonal housing decreased from 4% to 2% of all housing units.

Carmel has proportionately more occupied year-round housing than countywide or statewide, because it has very little shorefront property.

Table 3-1. Housing Occupancy (All Housing)

Occupancy Status	Carmel				Comparison (2000 Census)	
	1990		2000		Penobscot	Maine
	#	%	#	%	% of Total	
Occupied Year-round	679	92%	932	94%	87%	79%
Seasonal, Recreational	26	4%	18	2%	7%	16%
Vacant	30	4%	45	5%	6%	5%
Total Housing Units	735	100%	995	101%	100%	100%

Source: U.S. Census, 1990 and 2000

Almost 88% of Carmel's housing was owner occupied for the 2000 Census, down from 92% for the 1990 Census (Table 3-2). There were 109 renter occupied units for the 2000 Census.

Carmel had a significantly higher proportion of owner occupied units (88%) than countywide (70%) or statewide (72%). This could be attributed to the fact that Penobscot County and the state have many larger, urban areas where rental housing is more common.

The homeowner vacancy rate in Carmel was 1.4%, for the 2000 Census, which suggests that there was a very limited selection of homes for sale at that time. Generally, a vacancy rate of 5% to 6% is desirable to allow for adequate choice in homes available to purchase. Carmel's vacancy rate of 6.8% for rentals suggests that there was a better choice in rentals, and perhaps even an excess of units for rent.

Table 3-2. Housing Tenure, Occupancy Status and Vacancy Rates (Year-round Housing)

Occupancy Status of Year-round Occupied Units	Carmel			Comparison (2000 Census)	
	1990	2000		Penobscot	Maine
	%	#	%	% of Total	
Owner Occupied Units	92%	823	88%	70%	72%
Renter Occupied Units	8%	109	12%	30%	28%
Total Occupied Units	100%	932	100%	100%	100%

Source: U.S. Census, 1990 and 2000

Vacancy Rate Comparison: 2000	Percentage of Year-round Units		
	Carmel	Penobscot	Maine
Homeowner Units	1.4%	2.3%	1.7%
Rental Units	6.8%	6.2%	7.0%

Source (Vacancy Rates): U.S. Census, 2000

[16] *Much of the following information is based on 1990 and 2000 Census data, the most current available data to date. The data is useful for presenting an overview of existing condition and trends, but there appear to be some discrepancies based on local knowledge.*

Housing Types

There were 684 single family homes in Carmel, which was about 69% of the Town's housing stock (Table 3-3). About 27%, or 271 units, were mobile homes, and about 4%, or 40 units, were multifamily units. Multifamily housing in Carmel was 2 to 4 units.

Carmel had proportionately more mobile homes and less multifamily units than either county-wide or statewide. This is somewhat typical of a rural community without sewer and water to support multifamily housing and with mobile homes one of the primary options for affordable housing.

Table 3-3. Housing Types (All Housing)

Housing Type	Carmel	Comparison		
		Carmel	Penobscot	Maine
	# units	Percent of Total		
Single Family Units*	684	69%	63%	70%
Multifamily Units**	40	4%	23%	20%
Mobile Homes	271	27%	14%	10%
Total Housing Units	995	100%	100%	100%

Notes: *Includes both detached and attached single family housing.
** Two or more units
Source: U.S. Census, 2000

Housing Conditions

The overall age of a community's housing stock is an indicator of housing conditions. Older housing often requires more upkeep, and may need new wiring, winterization and lead paint remediation. Septic systems associated with older homes may also need to be repaired or replaced.

Carmel had about 293 housing units that are over 40 years old based on the 2000 Census (Table 3-4). This was almost 30% of the Town's housing stock.

Overall Carmel's housing stock appears to be newer than county-wide or statewide. County-wide about 54% and state-wide about 53% of housing is over 40 years old.

Table 3-4. Year Structure Built

	Carmel		Penobscot County	Maine
	Number	%	%	%
1990 to March 2000	281	28	14	15
1980 to 1989	227	23	15	16
1970 to 1979	194	20	17	16
1940 to 1969	103	10	26	24
1939 or earlier	190	19	28	29
Total housing stock surveyed	995	100	100	100
Median Year			1966	1966

Source: 2000 Census

Inadequate Septic Disposal in the Village

Perhaps the most significant issue for Carmel is the small house lots in the village with substandard on-site waste water disposal systems. Most of the lots in the village are ½ acre with an on-site well and septic system. This situation will constrain future development in the village. The village also includes several businesses and public facilities, including the town office.

Initiatives to Improve the Town's Housing Stock

The following is a listing of programs designed to address substandard housing.

- **Community Development Block Grants (CDBG):** The Maine Community Development Block Grant (CDBG) Program has a Housing Assistance Program designed to assist low-moderate in-

come individuals in rehabilitating their homes. Rehabilitation could include same-site replacement housing, relocation assistance, historic preservation, lead paint removal, asbestos removal, radon control, foundation work, water and septic improvements, and other health and safety repairs.

- **Penquis Programs:** Housing assistance includes the following programs: Energy Conservation and Heating Improvement, Environmental Inspection and Testing Services, Home Repair and Replacement, Housing Assistance, Housing Development Service, and Home Performance.
- **Septic System Upgrades:** By participating in the Maine Department of Environmental Protection's Small Community Grant Program the Town could assist homeowners in obtaining grants to replace malfunctioning septic systems that are polluting a water bodies or causing a public nuisance. Grants may be used to fund 25% to 100% of design and construction cost depending on property owner income.

Housing Affordability

Adequate, affordable housing to a range of household incomes is essential to a healthy community. Changing demographics suggests there will be proportionately more middle-age people and senior citizens in the future. There will be fewer young adults and children. Housing needs change as the population ages. Middle-age people, often at their peak earning capacity, may want larger homes, especially if they still have children at home. People approaching retirement age or concerned about living on a reduced income may be seeking smaller, lower maintenance, more energy efficient housing. Some seniors may want assisted living and, in some cases, nursing home care. People commonly affected by a shortage of affordable housing include senior citizens on fixed incomes, single parents, first-time home buyers, young families, and grown children seeking independence from parents.

Maine's Comprehensive Planning Act addresses affordable housing needs by requiring that towns strive to make at least 10% of new residential housing within the range of affordability for low and moderate income households based on a five-year historical average of residential development. "Affordable housing" means decent, safe and sanitary dwellings, apartments, or other living accommodations for a household whose income does not exceed 80% of the median income for the Bangor Statistical Metropolitan Area Housing Market. The objective is to assure a supply of housing that is affordable to households in three income groups:

- "Very low income" households with incomes that do not exceed 50% of the median income in the county.
- "Lower income" households who have incomes between 51% and 80% of the median income in the county.
- "Moderate income" households who have incomes between 81% and 150% of the median income in the county.

Further, an owner-occupied unit is "affordable" to a household if its price results in monthly housing costs (mortgage principal and interest, insurance, real estate taxes, and basic utility costs) that do not exceed 28% to 33% of the household's gross monthly income. A renter occupied unit is "affordable" to a household if the unit's monthly housing costs (including rent and basic utility costs) do not exceed 28% to 33% of the household's gross monthly income.

Affordable housing types typically include, but are not limited to: multifamily housing, rental housing, mobile homes, government assisted housing, group and foster care facilities and accessory apartments. The affordability of housing can also be impacted by municipal land use regulations, including road standards. Regulations that allow smaller lot sizes, road frontages and setbacks, and an increased number of units per acre (higher densities), and road and sidewalk requirements that are adequate, but not excessive, allow for more affordable housing development. Cluster housing standards can also be used to reduce the cost of roads and utilities.

Homeowner Housing Affordability

Homeownership is considered affordable in Carmel according to the Maine State Housing Authority (MSHA). The MSHA has developed an "affordability index" that defines affordable housing as housing costs that do not exceed 30% of a household's income.

The "affordability index" compares median household income to median home price (with taxes and mortgage payments factored in) to determine affordability. An affordability index of 1.00 means that a household with a median income can afford to purchase a home at the median home price. An index of above 1.00 is more affordable and an index below 1.00 is less affordable.

Carmel had a "more affordable" index of 1.09 (Table 3-5). The affordability indexes for the Bangor Housing Market Area (.94), Penobscot County (.92), and Maine (.79) were considered "less affordable".

Table 3-5. MSHA 2008 Housing Affordability Comparison

Area	Affordability Index*[17]	Median Home Price	Median Income	Income Needed to Afford Median Home Price	% Households Unable to Afford Median Home Price	Home Price Affordable to Median Income
Carmel	1.09	$125,500	$47,756	$43,715	45.3%	$137,100
Bangor HMA	0.94	$141,250	$44,045	$46,998	53.6%	$132,375
Penobscot Co.	0.92	$134,900	$42,152	$45,608	54.1%	$124,679
Maine	0.79	$178,000	$46,321	$58,951	62.6%	$139,864

* Bangor Housing Market Area.
Source: Maine State Housing Authority, 2009

Carmel's housing has become increasingly more affordable over the past several years (Table 3-6). In fact, the indexes for the years 2004, 2005 and 2006 were in the "less affordable" category. Then, in both 2007 and 2008, the indexes were in the "more affordable" category. To some extent this was probably the result of the recession and the drop in home prices, while incomes were still increasing.

Town officials confirm that land prices have declined over the past several years.

[17] *Homeowner Affordability Index is how much the median income household can afford divided by the cost of the home. The amount that can be afforded assumes that no more than 28% of a household's income can be used for the monthly mortgage payment, a loan period of 30 years at a fixed interest rate (zero points) with a 5% down payment, plus hazard insurance, PMI and taxes. Rental Affordability Index is how much the median income household can afford divided by the cost of an average rent (rent is defined as including utilities such as heat, hot water and electricity). The amount that can be afforded assumes a renter pays no more than 30% of their income on rent.*

Table 3-6. Trends in Housing Affordability in Carmel over the Past Five Years					
Year	Index	Median Home Price	Median Income	Income Needed to Afford Median Home Price	Home Price Affordable to Median Income
2004	0.85	$141,950	$40,479	$47,785	$120,247
2005	0.93	$134,900	$41,452	$44,394	$125,961
2006	0.79	$165,050	$45,471	$57,492	$130,540
2007	1.06	$127,500	$47,217	$44,412	$135,553
2008	1.09	$125,500	$47,756	$43,715	$137,100
Source: Maine State Housing Authority, 2009					

Rental Affordability

Carmel had about 111 renter households in 2008, according to the MSHA. MSHA estimated that the average rent for a 2 bedroom unit with utilities was about $824 in 2006. Calculating the affordability of Carmel's housing using the index is not very accurate due to the very limited number of rentals and the availability of data on rents. Town officials estimate that the average rental in Carmel is around $700.

However, local knowledge combined with rental data for the Bangor Metropolitan Area Housing Market Area (Bangor MA HMA), County and State (Table 3-7) can be used to reach a few general conclusions about the affordability of rentals in Carmel. As displayed below, more than 60% of households are unable to afford the average 2 bedroom rent for the Bangor MA HMA and Penobscot County. In fact, it appears that rentals are less affordable in the Bangor MA HMA than either countywide or statewide.

Table 3-7. Comparison: Rental Housing Affordability for 2008			
Area	Avg. 2 Bedroom Rent*	Income Needed to Afford Median 2-Bedrm. Rent	% Households Unable to Afford Avg. 2 Bedroom Rent
Bangor HMA	$877	$35,069	62.4%
Penobscot Co.	$834	$33,344	60.9%
Maine	$847	$33,878	57.0%
* Include utilities Source: Maine State Housing Authority, 2008			

Housing Affordability for Low Income Households

Some low income households may be having a difficult time affording housing in Carmel. The MSHA calculated that Carmel had about 398 low income households, which is 38% of all households[18] (Table 3-8). These households have incomes of less than $38,205, which is less than 80% of the median household income of $47,756. MSHA calculated that 227 of these households were very low income households with incomes of less than $23,878.

[18] MSHA estimated that there were a total of 1,049 households in Carmel in 2008.

Table 3-8. Low Income Households in Carmel			
Income Categories	Income	Number of Households	% of Households
Very Low (up to 50% of Median Household Income)	$23,878	227	21.7%
Low (greater than 50% to 80% of Median Household Income)	$38,205	171	16.2%
Total Low Income Households	-	398	37.9%
Median Household Income	$47,756	-	-
Moderate (greater than 80% up to 150% of Median Household Income)	$71,634	444	42.2%
Source: Maine State Housing Authority, 2008			

There were about 324 low income homeowner households according to the MSHA (Table 3-9). This was about 35% of all low income homeowners. Renter households, including potential homeowners (renters age 25 to 44), and senior households are proportionately more likely to be low income households than homeowner households as is displayed in the Table below. There is some overlap in the categories, for example seniors who are also renters are included in both categories. Potential homeowners are renter households where tenants are age 25 to 44.

Table 3-9. Low Income Households by Category		
Category	Number of Low Income Households	% of all in Category
Homeowners	324	35.0% of all Homeowners
Renters	74	60.4% of all Renters
Potential Homeowners (Renter Households – Age 22 to 44)	30	53.2% of all Potential Homeowner Households
Seniors (Age 65 and Over)	128	66.8% of all Senior Households
All Low Income Households	398	37.9% of all Households
Source: Maine State Housing Authority, 2008		

Subsidized Housing

Government subsidized housing is designed to serve the needs of low income individuals and families who meet certain income guidelines. Subsidized housing in Maine primarily comes in the form of subsidized rental units at affordable rents, vouchers for non-subsidized rental units, and low interest loans for first time home buyers.

As a rural community, Carmel has very little subsidized housing. According to the MSHA the only subsidized rental housing in Carmel in 2008 were six Section 8 Vouchers[19]. Service center communities and communities with sewer and water are better suited to providing large amounts of subsidized housing,

[19] *Section 8 (Housing Choice Voucher Program) is federal assistance provided by the U.S. Department of Housing and Urban Development (HUD) dedicated to sponsoring subsidized housing. Under this program, eligible families with a certificate or voucher find and lease a unit in the private sector and pay a portion of the rent (based on income, generally around 30%). The local housing authority pays the owner the remaining rent, subject to a cap referred to as "Fair Market Rent" (FMR) which is determined by HUD. The owner cannot charge a Section 8 tenant more than FMR, even if the owner does so for non-Section 8 tenants in similar units. Landlords, though required to meet fair housing laws, are not required to participate in Section 8 programs, and may thus decline to accept a tenant with a Section 8 voucher.*

which are often multifamily complexes. Subsidized housing is also better when it is close to services to reduce the costs of travel to and from work and for goods and services.

Table 3-10 displays the number of families that took advantage of the MSHA's First-Time Homeowner's program over the past five years.

Table 3-10. MSHA First-Time Homeowners						
Number of	2004	2005	2006	2007	2008	Total
Families/Units	3	4	2	1	6	16
Source: Maine State Housing Authority, 2008						

Housing Needs Summary

MSHA determined that there was a need for 29 more affordable family rental units and an additional 12 affordable units for seniors (age 65 and over) in Carmel for 2008 (Table 3-11). This was based on the number of renter households with incomes at or below 50% of the median income minus the available subsidized units.

Table 3-11. Housing Needs Summary for 2008		
	Family Units	Seniors Units (65 and over)
Number of Renter Households @ 50% AMI	35	12
Number of Subsidized Units Available (Section 8)	6	0
Number of Affordable Rental Units Needed	29	12
Indicated Unmet Need %	83.0%	100.0%
Source: Maine State Housing Authority, 2008		

Local Regulations that affect the Development of Affordable Housing

Affordable housing options in small rural towns without centralized sewer and water generally includes: mobile homes, mobile home parks, accessory apartments (in-law apartments), clustered housing, and small multifamily structures. Multifamily structures are becoming a more viable option in rural communities with technological advances in engineered septic systems.

Carmel's land use ordinances allow a variety of affordable housing options in a number of locations. The Town has two zones: the Residential–Farming Zone and the Commercial Zone. There is a town-wide minimum lot size of 2 acres and road frontage requirement of 200 feet, with a few exceptions.

The Residential-Farming Zone allows single family dwellings, mobile homes, and subdivisions. A special use permit is required for trailer parks or mobile home courts (mobile home parks), and the dimensional requirements for each trailer space must be 150' by 150'. Roadways must be at least 60' wide. Both of these dimensional requirements conflict with Maine's Manufactured Housing Law (MRSA 30-A Sec 4358), that limits municipal regulation of mobile home parks. For example, the statute prohibits towns from requiring mobile home park lots larger than 20,000 sq. ft. and internal road right of ways wider than 23 feet.

Since the Residential-Farming Zone is a rural area, the most appropriate form of affordable housing, in general, would be accessory apartments and single mobile homes.

The Commercial Zone allows any use permitted in the Residential-Farming Zone, except trailer parks and mobile home courts. In addition, two-family units, apartment houses, lodging houses, hotels, motels and overnight cabins are allowed. All new roads are required to have 66' ROW and two 10' lanes.

Subdivision Ordinance – Carmel's existing subdivision ordinance does not permit clustered subdivisions.

Clustered housing is a good way to allow for more affordable housing designs, while at the same time preserve open space. The lots and housing can be made more affordable through the allowance for smaller lots and other dimensional requirements, which also results in less costs for roads and utilities and other infrastructure. In general, more detailed cluster/open space housing provisions would assist the town in administering these provisions and help potential developers and the public understand the provisions.

There are several amendments that might be considered to support more affordable clustered housing:

- Allow smaller minimum lot sizes and/or smaller minimum to be used in calculating overall density for clustered housing designs
- Allow the use of combined septic systems, or septic systems located in the open space area
- Allow reduced frontages, setbacks and other dimensional requirements for cluster subdivisions

Regional Affordable Housing Coalitions

Subsidized multi-family housing or assisted living facilities are probably not appropriate for Carmel due to its location some distance from service center communities, and lack of centralized sewer or water. MSHA programs for individual units, such as Section 8 Vouchers and First Time Homeowners loans are appropriate for Carmel residents, and the town can help make residents aware of these programs. The town will need to monitor the housing needs of its citizens, particularly as they age, and work with the service center communities, as appropriate to fulfill these needs.

Carmel is not involved with any existing affordable housing coalitions or any other similar efforts, but may want to monitor the activities of regional entities.

CHAPTER 4. PUBLIC FACILITIES AND SERVICES

Overview

The provision of municipal services and facilities is a central component of comprehensive planning: not only in how and what services are provided, but also in how they affect the location of future development within the community. This chapter is an inventory and analysis of community services and facilities (Also see Community Facilities Map). The condition and capacity of these services and facilities is examined to determine what improvements, if any, might be needed to serve anticipated population growth and economic development within the next ten years.

It is important to understand how growth and development can affect town expenses for a small, growing community like Carmel. Research over several decades both within and outside Maine has shown there is a consistent pattern in the way municipal expenses increase as the population increases.[20] As towns grow in population, local government expenses tend to increase in a step like fashion. The increase doesn't necessarily happen right after a new subdivision goes in, but usually happens after the number of new homes, or the population increases to a certain threshold, or tipping point. When that threshold is met, expenses increase significantly to meet the demands, and then often level off until the next threshold comes. As more and more new (often more affluent) people move into town there is a corresponding increase in demand for more suburban-type services and infrastructure (better roads, improved emergency services, etc.). For a while, these new homeowners contribute enough in taxes to support increases in services with little extra cost to individual taxpayers. But at some point (research indicates when the population reaches 2,500 to 6,000), major improvements are needed and costs increase dramatically.

Carmel's population is estimated to be around 2,700 people. Planning for the eventuality of a more suburban community can only work to the town's benefit. Planning ahead for necessary or anticipated capital improvements, and guiding growth and development to areas most efficiently served, are actions the town can take today to manage ongoing and future municipal expenditures.

SUMMARY

Are municipal services adequate to meeting changes in population and demographics?

In general, Carmel has the capacity to adequately provide necessary services to its citizens over the next decade.

[20] *"The Costs of Sprawl", Maine State Planning Office, 1997*

Has the community partnered with neighboring communities to share services, reduce costs and/or improve services? Inter-local agreements and other regional cooperation include:

- Solid waste disposal through membership in the Penobscot Energy Recovery Company (PERC);
- Household hazardous waste disposal and recycling through the City of Bangor;
- Emergency dispatch through the Penobscot County Regional Communications Center;
- Regional emergency and disaster planning through the Penobscot County Emergency Management Agency;
- Contract for sheriff's deputy through the Penobscot County Sheriff's Department;
- Fire and rescue participation in county-wide mutual aid program, as well as mutual-aid agreements with Etna, Stetson and Levant;
- Ambulance back-up through Hermon and Bangor; and
- Public education as member of RSU 87/SAD 23 with Levant.

How does the community address septic tank waste? What issues or concerns are there with the current arrangements?

Individuals contract with private haulers to dispose of septage. Septage is not disposed of within Carmel. No issues or concerns have been identified.

Are there any concerns associated with the lack of public water or sewer in the community?

Carmel does not have a public water system or a public sewer system. There is concern about the number of small lots in the village and the potential for contamination from on-site septic systems. There is land in the village where a public water supply could be constructed. Other options would be private engineered water/septic systems.

What school improvements, including construction or expansion, are anticipated during the planning period? What opportunities are there to promote new residential development around existing and proposed schools? What steps will be taken to promote walking and bicycling to school?

RSU 87/SAD 23 does not anticipate any major construction/expansion projects within the next 10 years.

Even though the Carmel Elementary School is located in the village, very few students walk to and from school. The Caravel Middle School is located in rural Carmel where students usually ride the bus to school.

Is the community's emergency response system adequate? What improvements are needed?

The Town's emergency services are generally adequate for the foreseeable future. Fire Trucks are the most significant expenditure and they are replaced on a regular basis with funding from a reserve account. The Fire Chief has identified adequate staffing as a significant challenge for a number of reasons.

How well is the solid waste management system meeting current needs? What is the community doing to reduce the reliance on waste disposal and to increase recycling? What impact will projected growth during the planning period have on system capacity? What improvements are needed to

meet future demand? What efforts have been or will be undertaken regionally to improve efficiency and lower cost?

Carmel is a member of Penobscot Energy Recovery Company (PERC), a waste-to-energy facility in Orrington. The Town contracts with a private hauler to provide weekly curb-side pick-up and to transport solid waste directly to PERC. PERC facility appears to have sufficient capacity to provide for the waste disposal needs of its member towns for the foreseeable future.

The recycling rate is around 13%, which is very low. The Town provides curb-side pick-up of recyclables once a month. To encourage recycling the Town advertises the service in the Newsletter and on its WEB page, and has handouts at the Town Office.

How do public facilities and services support local economic development plans? What improvements are needed in the telecommunications and energy infrastructure?

Adequate public facilities and services support local business activity. High speed internet, cell phone reception, and three phase power are available in many areas of the Town where they are most needed. Expansion of these services, particularly high speed internet to all of town may help individuals with home occupations and businesses located in the areas where they are not available.

Does the community have a public health officer? Are there significant public health issues?

Carmel has a public health officer, but has not identified any significant public health issues at this time.

What other public facilities, such as town offices, libraries, or cemeteries, are nearing their respective capacities? How will these facilities accommodate projected growth?

The Town's public facilities, including the Municipal Building and Fire Station, recreation facilities, and the sand/salt facility generally have adequate capacity for the next decade. Capital needs identified include fireproof records storage at the Town Office, paved parking at the Recreation Area, and a dump truck and a small front end loader/tractor for the Public Works Department[21]. The Library is fundraising for an addition. The most significant potential capital need is the need for a public water supply in the village.

Are the community's priorities for funding needed improvements reflected in the capital investment plan? Where are investments in facility improvements directed?

Facilility improvements, other than roads and bridges, are primarily envisioned for the village area, as described in the Part I. Recommedations: Capital Investment Plan.

[21] *Truck was purchased in 2011.*

Supporting Documentation

Town Government

The Town of Carmel was incorporated on June 21, 1811. Carmel has a selectman-town manager form of government. The Town Meeting elects five selectmen on a rotating basis to represent the town. The legislative body is the Town Meeting, which is held annually in March.

The full-time Town Manager also serves as Town Clerk, Tax Collector, Treasurer, Road Commissioner, and General Assistance Administrator.

Carmel's other positions include:

- Administrative Assistant, Registrar of Voters
- Assessor
- Deputy Town Clerk, Deputy Registrar of Voters, Deputy Treasurer
- Emergency-911 Addressing Agent
- Fire Chief
- Librarian
- Rescue Chief
- Animal Control Officer
- Code Enforcement Officer
- Recreation Director
- Emergency Management Director
- Health Officer
- Office Manager
- Constable/Deputy Sherriff

The following boards and committees are made up of appointed officials:

- Appeals Board
- Cemetery Committee
- Water Control Committee
- Budget Committee
- Planning Board

Carmel's elected officials serve on the following:

- Maine School Regional School Unit 23 and 87 (SAD 87 and 23) Board
- Board of Selectmen (five members)

The Comprehensive Plan Committee and Town Manager indicated that the Town's administrative structure and organization should generally be adequate for the next decade.

Publicly Owned Land and Buildings

There are a number of publicly owned facilities in Carmel. These include a combined municipal building and fire station, the sand/salt shed, the public library, a rental garage (the former fire station), two recreational areas and four cemeteries. **(See Appendix – Penobscot County Hazard Mitigation and Recreation and Infrastructure Maps)**

Town owned facilities are as follows:

- Municipal Building/Fire Station (4+ acres)
- Recreation Area (18 acres)
- Highland Cemetery (10 acres)
- North Carmel Cemetery (1 acre)
- Sand/Salt Shed (7 acres)
- Village Cemetery (1 acre)
- Ruggles Cemetery (1 acre)
- Rental Garage (former Fire Station)(7/10 acre)

Municipal Building and Fire Station: The combined municipal building and fire station are located on 4+ acres of land near the center of the village. They are currently used for a variety of municipal uses including town offices and meeting facilities for town and public use as well as housing the fire station. The facility was expanded and reconfigured several years ago and should meet the community's needs for the next decade and beyond. The only need identified at this time is for fireproof records storage.

Old Fire-Station/Rental Garage: The old fire-station, located on seven-tenths of an acre near the center of town is now a rental garage.

Sand/Salt Shed Lot: Carmel's sand/salt shed is located along Route 2 near the railroad overpass. The covered structure was built in the mid 1980s, and should be adequate for the next decade and beyond.

Recreation Facilities: The only recreation facility owned by the Town of Carmel is the Recreation Area. The Carmel Recreation Area, which is located off Five Road, has a total of 18 acres. Recreation is discussed in more detail in Chapter 5 Recreation.

Cemeteries: The four cemeteries owned and maintained by the Town of Carmel are Highland Cemetery, Village Cemetery, North Carmel Cemetery, and Ruggles Cemetery. A 40 lot addition has been completed at the North Carmel Cemetery, and a 100-lot addition has been done at the Ruggles Cemetery. As a result, there should be adequate cemetery space for the next decade.

Public Water Supply and Public Sewer System

Carmel does not have a public water supply system or a public sewer system. Most residents and businesses rely on private wells and individual on-site septic systems. The schools, mobile home parks, and several other businesses utilize wells that are considered "public supplies," but these are not owned by the Town, and are described in Chapter 8 Water Resources.

There is some concern about potential contamination of wells located in village area, where the lots are too small to relocate or enlarge failing systems. Either a public water supply or public sewage facilities for this area may become a necessity in the future. The Town owns a parcel in the village off Five Road that could potentially accommodate a clustered system.

Currently, disposal of septage (the waste pumped from septic systems) is handled through individual contracts and is not disposed of within town limits.

Solid Waste Disposal and Recycling

The Town of Carmel is a member of Penobscot Energy Recovery Company (PERC), a waste-to-energy facility in Orrington. The Town contracts with a private hauler to provide weekly curb-side pick-up and to transport solid waste directly to PERC. Carmel also holds a fall clean-up day every October for large bulky items. The PERC facility appears to have sufficient capacity to provide for the waste disposal needs of its member towns for the foreseeable future.

The Town also contracts with a private hauler to provide curbside pick-up of recyclables the first Tuesday of each month. Recyclables are then transported to the Bangor recycling facility. The Town's recycling rate is around 13%. To encourage recycling the Town advertises the service in the Newsletter and on its WEB page, and has handouts at the Town Office.

Carmel also participates in the Bangor area regional household hazardous waste disposal day where residents can drop off TVs, VCRs, microwaves, computer monitors, florescent lights and other toxic and hazardous materials.

The table displays available information on Carmel's municipal solid waste disposal and recycling program. The current tipping rate is $73 per ton for both solid waste and recyclables.

Table 4-1. Municipal Solid Waste and Recycling Report, 2003 through 2009

Year	Solid Waste (Tons)	Recycling (Tons)	Recycling Rate (%)	Town Expenses
2003	1,128.8	65.3	7.8	$144,000
2004	1,111.2	75.2	6.3	$134,711
2005	1,138.6	-	-	-
2006	1,188.5	39.3	3.2	$150,000
2007	1,229.5	22.2	na	$182,565
2008	1,205.8	36.4	na	$187,000
2009	1,214.0	33.3	na	$215,259

Source: Town Manager (2007-2009), Maine State Planning Office (2003-2006)

Emergency 9-1-1 System (E 911), Dispatch and Response

Carmel has a complete and functioning E-911 addressing and management system including an addressing ordinance, addressing agent and reporting system. Road signage and addressing is in place.

Dispatch for all emergency calls is provided through Penobscot County Regional Communications (PCRG) whose office is located in Bangor.

Table 4-2. Overview of Emergency Services

Service	First Responder	Average Response Time (Estimate)	Back-up Responders
Police Protection	Carmel Police Deputy*	10 to 15 minutes	Penobscot County Sheriff's Department and Maine State Police
Fire Protection	Carmel Fire Department		Penobscot County Mutual Aid Agreement
Emergency Medical – Ambulance, First Responder	Carmel Fire Department Ambulance		Hermon and City of Bangor Ambulance Services

*The Town contracts with the Penobscot County Sherriff's Department for these services.
Source: Town Manager

Emergency Planning and Hazard Mitigation

Carmel participates with the Penobscot County Emergency Management Agency (PEMA) in preparing for all types of disasters. Carmel has a Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA). This enables the Town to qualify for assistance associated with all types of disasters (flooding, forest fires, homeland security, hazardous chemical spills, and flu pandemics).

Flooding is not an extensive problem in Carmel, although there have been a few areas where it has damaged property. Carmel does not participate in the Federal Emergency Management Agency (FEMA)

Flood Insurance Program, which is designed to assure appropriate use of floodplains and reduce the risk of property loss. In participating communities, property owners and renters are eligible to purchase subsidized flood insurance, which is often required when applying for a loan or mortgage for property located on a floodplain. **(See Appendix - Penobscot County Hazard Mitigation and Development Constraints Maps)**

Police Protection

Carmel has one part-time constable, who is a Deputy Sherriff with the Penobscot County Sheriff's Department. The Deputy Sherriff works on a rotating forty-hour-a-week schedule. Back-up is provided by the Penobscot County Sheriff's Office and the State Police. This arrangement was begun in 2003 and currently costs the Town about $75,000. This level of police protection should be adequate for the foreseeable future.

Fire, Rescue, and Ambulance Service[22]

The Carmel Fire and Rescue Department is a municipal fire and ambulance service combined, under the direction of a Fire Rescue Chief. The present structure of the organization has an assistant fire chief, one assistant EMS chief, 2 captains (one in charge of training, and the other in charge of lieutenants), 3 fire lieutenants, and one EMS lieutenant. Each lieutenant is in charge of a piece of apparatus or the ambulance. The officers are responsible to provide training programs, and maintain the safety of the crew.

Presently there are several trends that the Fire Chief sees in the fire service. One is the increase in the number of building fires. These have been on the rise in the past several years. Carmel is also responding out of town more to assist with building fires, as other towns are having the same staffing issues.

The second trend is the continuing loss off responders. Presently the Carmel Fire and Rescue Department has 26 people on the roster, with an average of 6-7 responding to fires and 2 to medical calls. During the day, there is only one or two around, as most of them work out of town. Many jobs today will not allow responders to leave.

The third trend is the loss of advanced life support trained responders – paramedics. Emergency medical work has become so specialized; it is challenging to do as a volunteer. Carmel no longer has paramedics working on the service, and therefore this license level and equipment will soon be removed from the ambulance. The down side is the wait for a paramedic level ambulance to arrive in Carmel, presently from the city of Bangor. The costs of training to become licensed and the time required to learn the skills are making it difficult for people in town to attend and complete the training.

The fourth trend is the increase in required training, in everything from blood borne pathogens, to the National Incident Management System. These are tremendous classes that provide a lot of information to town responders. The Carmel Fire Department does not have any full time staff who can

[22] *Material from letter from Michael J. Azevedo, Jr.Fire Chief, Carmel Fire & Rescue, January 25, 2011*

concentrate on learning and then teaching this information. As a chief, I am unable to keep on top of the training and be able to make sure that every responder has all the training that they need.

Carmel Fire and Rescue has very good equipment. All the fire apparatus and ambulance are in good shape.

Carmel has four fire trucks and one ambulance.

- Ambulance; 2001 Ford E-450; MCCOY Miller Box - Good Shape
- Engine; 1991 Salsbury on Spartan Chassis; 1500 GPM Pump/750 Gal Water with foam - Good Condition (Pump Overhaul in April 2010)
- Tanker; 2006 International E-One; 1250 GPM Pump/3000 Gal Water - Good Condition
- Tanker; 1992 Ford; 500 GPM/1800 Gal Water - Good Condition,
- Brush; 2011 Ford E-350 Brush Truck; 250 GPM/300 Gal Water - Brand New

The fire station is adequate for now. The recent addition of the back room in 2007 provided a needed training area. The officers require work space and presently all share one office. The chief has an office. The station has very limited storage space. The fire station has no room for apparatus expansion. On Tuesday night when the entire crew is there, it quickly becomes very small, especially with several different groups working on different projects. In the next 10 years, the Chief believes there will need to be expansion if the town continues to support a Fire and EMS department.

Carmel Fire and Rescue is presently undertaking a three year project to repair, replace and install new dry hydrants in town. Four were replaced this year. We are looking at putting hydrants into large ponds with road access. As crews become smaller, more water supplies are going to be required so this will be an ongoing project.

Lastly, the department is working on maintaining work agreements with its mutual aid departments. As responders leave the public safety arena, it will require mutual aid agreements with other towns to assist the citizens of Carmel when fire and medical emergencies strike. This is the norm rather than the exception nationwide. In the event of a countywide disaster, there will not be enough resources or responders to assist all the citizens. Neighbors will have to help neighbors.

Public Works

Carmel does not have a public works facility and does not have any full time employees for road maintenance. Currently, part-time seasonal employees are hired on an as needed basis for things such as brush cutting along the roads and minor road repairs. All other road work is contracted.

The Town owns a 1987 1-ton dump truck, a 1990s patch machine and a York rock rake, which is quite old, and in fair to poor condition. The dump truck is slated to be replaced in 2011 at an estimated cost of $12,000 to $16,000. The Town also indicated that a small front-end loader/tractor would be a desirable.

Road maintenance has its challenges within Carmel. A detailed discussion of this topic is found in the Transportation chapter of this Comprehensive Plan.

Street Lighting

There are 21 street lights owned and maintained by Central Maine Power. Most of the poles are located in the village area, although some are located at other intersections around town. This amount of lighting appears to be adequate for the foreseeable future.

Communications

Communication services in Carmel consist of Fairpoint Communications telephone service, Time Warner Cable TV, the Bangor Daily News, and the Rolling Thunder (newspaper). Internet service is available through several servers, including Verizon and Time Warner. Broadband (high speed internet) is available in many areas of the town. There is adequate cell phone coverage in most areas of town.

Town WEB Page and Newsletter - Carmel has a well-developed WEB page (www.townofcarmel.org) that provides an extensive amount of information about town government and the community, and provides links to area organizations and businesses. The Town also publishes a quarterly newsletter.

Electrical Service

Electrical service is provided by Central Maine Power to most of Carmel; Bangor Electric provides service on the Murray Road. There appears to be no problem with meeting the needs of Carmel residents and businesses currently and for the next ten year. Annually, Carmel is contracted by both companies to identify problem areas and growth areas. Electrical service is provided accordingly.

Three phase power is available in many areas of town where it is needed.

Postal Service

Carmel has a post office which is located in a new building along Route 2 in the village. It is open six days a week. Rural delivery is provided throughout the town. The facility and service should be adequate for the foreseeable future.

Health Care

The Sebasticook Health Center, which was associated with the Sebasticook Valley Hospital in Pittsfield, is no longer operating in Carmel. The Center was staffed by one family practitioner and a number of support staff.

A full-range of medical services is available in Bangor, including the Easter Maine Medical Center.

The Town of Carmel appoints a public health officer who monitors statewide and local heath issues on an ongoing basis. No significant health issues have been identified at this time.

Cultural Resources

Cultural resources within Carmel include a library and various meeting facilities. Carmel residents also have access to a wide range of cultural resources in Bangor and Orono.

SIMPSON MEMORIAL LIBRARY

The Simpson Memorial Library incorporated in 1915, is a non-profit (501(C)3) organization overseen by a Board of Directors. The Library is located in the village on Plymouth Road. The most recent renovation was completed in the 1990s. Currently, the Board of Directors is raising money for an expansion.

The Library provides universal access to those who seek information, recreation and the pleasure of learning. Hours of operation for the library are Tuesdays, Thursdays and Saturday mornings. Library membership is around 980 (2009 Annual Report). The Library experienced an increase in attendance, usage of computers and materials in 2009. Attendance was 3,416, with a total circulation of 4,176. Computer usage more than doubled to 383. The Library participates in the inter-library loan program. Additionally, the Library offers a number of activities, such as summer reading programs, speakers and performers, and story hours.

The Library recently purchased new computers through grant funding, and has undertaken a major fundraising effort to expand its facility. The Town contributes about $20,000 annually to the Library.

OTHER ORGANIZATIONS

Other active organizations in town include:

- Carmel Historical Society
- Golden Harvest Grange
- Carmel Snowmobile Club
- Carmel Senior Citizens
- American Legion Post 107
- Masonic Lodge 87

MEETING FACILITIES

Carmel has a meeting room at the municipal building that is available to the public. It has a capacity of forty. The Recreation Area is also available for outdoor events. Rental facilities are available at the elementary school, the middle school, the Grange, and the Carmel Snowmobile Club.

Education

RSU 87/MSAD 23 serves the communities of Carmel and Levant. Each town elects three board members to serve on the district's school board. The district is made up of three schools. Carmel Elementary School services Pre-K to grade 4th grade students and has an enrollment of 230 students. Suzanne M. Smith Elementary School (Levant) services Pre-K to grade 5 students, and has an enrollment of 210 students. Caravel Middle School services grades 5-8, and has an enrollment of 230 students. The District has a contract for all secondary students to attend Hermon High School.[23]

Population projections for Carmel and Levant suggest enrollments will not increase significantly over the next decade. Schools have adequate capacity, and the District does not anticipate any major construction or expansion projects for the foreseeable future.

[23] School District WEB page, November 08, 2010 by Ryan Webber

SCHOOL LOCATION AND TRANSPORTATION

Students must either ride the bus, be driven or drive to school themselves, or walk along the sides of roads and streets. There are no sidewalks, bicycle lanes, or wide, paved shoulders along roads in Carmel.

The Carvel Middle School is located in a rural part of town, where there are a few residences nearby, so very few, if any, students walk or ride a bike to school. The Carmel Elementary School is located in the village, but safe areas to walk or bike to school are limited.

Regional Coordination

The following is a list of the Town's participation in regional coordination:

- Solid waste disposal through membership in the Penobscot Energy Recovery Company (PERC);
- Household hazardous waste disposal and recycling through the City of Bangor;
- Emergency dispatch through the Penobscot County Regional Communications Center;
- Regional emergency and disaster planning through the Penobscot County Emergency Management Agency;
- Contract for sheriff's deputy through the Penobscot County Sheriff's Department;
- Fire and rescue participation in county-wide mutual aid program, as well as mutual-aid agreements with Etna, Stetson and Levant;
- Ambulance back-up through Hermon and Bangor; and
- Public education as member of RSU 87/SAD 23 with Levant.

CHAPTER 5. TRANSPORTATION

Overview

The transportation system provides access to and from areas outside as well as within the Town. It ties together the various the land uses, and must remain efficient and functional to ensure the continued well-being and economic vitality of the community. Transportation planning and land use planning must work hand-in-hand to protect highway safety and mobility, and enhance economic opportunity, community livability, and environmental quality.

SUMMARY

What are the transportation system concerns in the community and region? What, if any, plans exist to address these concerns?

Ongoing, adequate maintenance of Route 2 and Route 69 that provide linkage to Bangor and I-95 are high priorities for the Town that are currently not being met. Route 2 is particularly important to Carmel and the State of Maine. Route 2 is a major east-west corridor and a heavy haul road, which is consistent with its increasing use by cars and trucks. This type of traffic inflicts a considerable amount of wear and tear on the pavement that has resulted in extensive cracking and potholes. MDOT has reconstructed many portions of Route 2 and continues to do so, but the sections of Route 2 important to Carmel are so bad that traffic is using town roads instead. The Town strongly advocates for ongoing upgrades of Route 2. It should also be noted that weight restrictions on the Interstate can impact the amount of truck traffic on Route 2[24].

In general, traffic congestion is not an issue in Carmel at this time. Several areas of concern were raised, however. It was suggested that a a four-way stop should be put in place at the intersection of Irish Road and Fuller Road where the Middle School generates considerable bus traffic. It was noted that the Horseback Road also has fairly heavy traffic due to MDOT Garage. Looking ahead, road capacity issues related to population growth and increased traffic may arise, and actions that the town can take to manage road capacity, such as managing the location and number of driveways, may be important to consider.

Adequately maintaining town roads and bridges is a challenge; particularly given the high cost associated with materials and paving. The Town must continue to budget and prioritize road construction projects in an effort to not fall behind. Two policies that control future costs include the policy not to pave gravel roads and the policy not to accept private roads as public roads. Regarding the later, the town would like to encourage the formation of road associations, and may want to amend its ordinances to require the formation of road associations in new developments that propose new roads.

[24] *Currently, the Interstate weight limit is 80,000 pounds, but there has been an effort to increase that to 100,000 pounds, which will reduce the volume of trucks on Route 2.*

Are conflicts caused by multiple road uses, such as a major state or U.S. route (Route 2, I-95) that passes through the community or its village and serves as a local service road as well?

Route 2 is a minor arterial that passes through the village of Carmel, where it also serves as a local access road. Those traveling through Carmel, whether by private vehicle or commercial vehicle – particularly truck, are seeking to move efficiently through the village and town. Local people, in particular, may be stopping at the post office, town office, school or local businesses.

Problems with speeding have been reduced since the Town hired a deputy sheriff for 40 hours a week.

To what extent are sidewalks available in residential areas? Do they connect residential areas with schools, neighborhood shopping areas, and other daily destinations?

There are no sidewalks in Carmel because it is a rural community without the funding to support the construction and maintenance of sidewalks. Walking and bicycling are not formally integrated into the transportation network.

How do state and regional transportation plans relate to your community?

The most significant state/regional transportation issue is the ongoing maintenance of Route 2. Any plans to change the truck weight limits on the Interstate will impact the amount of truck traffic on Route 2.

What is the community's current and approximate future budget for road maintenance and improvement?

The Town's 2010 budget was approximately $566,750. Transportation expenditures have remained the same over the past several years. It is anticipated that future budgets for road maintenance and improvements may increase in the future.

Many towns adopt formal road improvement programs designed to anticipate future needs for an upcoming multi-year period, and then adjust the schedule on a yearly basis within the budget voted upon at town meeting. This allows the public to see future needs, and consider these when deciding annual expenditures. One goal is to spread capital expenditures out over time to maintain a stable level of expenditures without spikes due to unanticipated road improvement needs. If, and when the Town's current system of maintaining roads on an as-needed basis no longer meets the community's needs, the Town might consider developing a multi-year road improvement program.

Are there parking issues in the community? If so what are they? If there are parking standards, do they discourage development in village area?

The only parking issue identified is the need to pave, and possibly expand the parking area at the Recreation Area.

The Town does not have any parking standards. Basic ordinance standards for parking and internal circulation could be adopted to assure that there is adequate off-street parking and loading areas and that traffic circulation within a development does not cause traffic hazards on public roads. This is an issue the Town might want to consider within the next ten years.

Do available transit services meet the current and foreseeable needs of community residents? If transit services are not adequate, how will the community address the needs?

The only available public transportation is the demand response and fixed route services provided by Penquis. This service is open to the public, but primarily provides social service agency transportation for seniors, low-income and special needs populations. These services should be adequate in the future.

Does the community have local access management or traffic permitting measures in place?

State driveway/entrance permits are required on all state highways in Carmel, and the Town informs landowners and potential buyers of land requiring access to state roads of this permit requirement, as required by law. In addition, the Town's Road Commissioner is responsible for issuing road entrance permits for all other roads, using state standards, as appropriate. The Town may want to consider formalizing its entrance permitting requirements by adopting written standards sometime in the future.

Do local road design standards support the community's desired land use patters?

Carmel's ordinances contain very basic street design and construction standards, and reference state standards that can be applied, as applicable. The Town's standards also include requirements for proper continuation of streets from adjacent subdivisions, built-up areas and undeveloped land, which can encourage the development of neighborhoods and can reduce the number of entrances onto public roads. In general, town roads in Carmel are designed for residential-farming type uses.

Do the local road design standards support bicycle and pedestrian transportation?

Carmel's rural roads generally accommodate pedestrians and bicyclers. The standards do not directly address bicycle and pedestrian transportation.

SUPPORTING DOCUMENTATION

Carmel's Public Works Department

Carmel's Public Works Department is responsible for maintaining about 30.57 miles of roads and streets, 8 town-owned bridges, the municipal parking areas at the Town Office and the Recreation Area. The Road Commissioner oversees the Department which operates on a yearly budget of around $566,000. Carmel does not have any fulltime employees for road maintenance. Part-time seasonal employees are hired on an as needed basis for work such as brush cutting along the roads. All other road work is contracted. The Town owns a one-ton truck for road patching and brush cutting.

The following sections examine each aspect of the transportation system. The accompanying Transportation Maps display information on Carmel's transportation system.

Highways and Streets

The highways in Carmel provide residents with convenient links to the interstate system and to the Bangor area, where employment opportunities, and goods and services are located. The function and condition of Carmel's highways and other public roads affect the value of property, the productivity of the community, and the overall safety and convenience of citizens, who depend on a well-maintained transportation system. Ownership and maintenance responsibilities of public roads are shared between the state and town.

Functional classification is the process by which public roads are classified according to the type of service they are intended to provide. Generally, highways fall into one of three broad categories:

- **Arterials** serve countywide, statewide or interstate travel, linking cities and large towns to an integrated highway network. Speeds on arterials are typically relatively high, although they may be lower through village and urban areas. Volumes of traffic typically range from thousands to tens of thousands of vehicles per day. Arterials are further divided between principal and minor arterial roads. Interstate 95 is a principal arterial and Route 2 is a minor arterial.
- **Collectors** link smaller towns, villages, neighborhoods, and major facilities to the arterial network. Traffic is collected from local roads and delivered to the nearest arterial. Daily traffic volumes generally range in the thousands. Route 69 in Carmel is a collector.
- **Local roads** provide direct access to residential neighborhoods, local businesses, agricultural properties and timberlands. Volumes typically range from less than one-hundred to possibly thousands of vehicles per day. Roads not classified as arterials or collectors are local roads.

The **State Highway System** designation determines maintenance responsibility, and is based on the function of the road. The highway system is grouped into the following three categories:

- **State Highways** form a system of connected routes throughout the state that primarily serve intra-state and inter-state traffic. The MDOT has responsibility for the year-round maintenance of State Highways. State Highways in Carmel include Interstate 95 and Route 2. There are 37.32 miles of State Highways in Carmel.
- **State Aid Highways** connect local roads to the State Highway System and generally serve intra-county rather than intra-state traffic movement. State Aid roads are usually maintained by MDOT in the summer and by towns in the winter. Route 69 is the only State Aid Highway in Carmel, and is about 14 miles in length. Carmel is responsible for winter maintenance of Route 69.
- **Town ways**, or local roads, are all other public roads not included in the State Highway or State Aid Highway classifications and are maintained by municipalities or counties. There are a total of almost 30.57 miles of local roads in Carmel that are maintained by the Town.

Heavy Haul Truck Routes are arterials that a particularly important to the transport of goods intra-state and inter-state. Interstate 95 and Route 2/100 are heavy haul truck routes.

Local Roads

An inventory of local roads is displayed in Table 5-1. The Town works on a continuing basis to maintain local roads to state standards in accordance with local conditions, and within an annual budget voted upon at Town Meeting. MDOT Urban-Rural Initiative Program (URIP)[25] funds are used to off-set municipal road improvement costs, and Carmel uses these funds for road construction.

Road improvement and maintenance is generally conducted on an as-needed basis that includes consideration of road condition and level of use. For example, $35,000 of crack sealing on 8.6 miles of road

[25] *URIP funds must be used for capital improvements to local roads and/or rural State Aid minor collectors.*

A "capital improvement" is defined as work on a road or bridge that has a life expectancy of at least 10 years or restores the load-carrying capacity.

was done in 2009. The Town also rents a boom mower to remove vegetation along roadways to reduce icing, maintain visibility and otherwise maintain the integrity of the ditches and roadway.

Many towns adopt a formal multi-year road maintenance program, either the one developed by MDOT's Local Roads Center or one similar to it. The idea is to anticipate future needs for the upcoming 6 year period, and then adjust the schedule on a yearly basis within the budget voted upon at town meeting. This allows the public to see future needs, and consider these when deciding annual expenditures. One goal is to spread capital expenditures out over time to maintain a stable level of expenditures without spikes due to unanticipated road improvement needs. If, and when the Town's current system of maintaining roads on an as-needed basis no longer meets the community's needs, the Town might consider developing a multi-year road maintenance program as described above.

(See Appendix – Transportation Map)

Table 5-1. Inventory of Local Roads				
Street Name	Description	Surface Material - Date Completed	Length (feet)	Condition
Fuller Road	Damascus to saw mill	Cold mix - 2003	1,174	Fair
Fuller Road	Sawmill to Five Rd.	Hot top - 2009	2,383	New
Fuller Road	Homestead Lane to Irish Rd.	Hot top - 2011	3,300	New
Fuller Road	Bridge to Hermon town line	Hot top - 2009	3,100	New
Five Road	Fuller Rd to Stetson town line	Hot top - 2007	7,750	New
Five Road	Rt. 2 to Fuller Road	Hot top - 2009	7,300	New
Irish Road	Fuller Rd. to Levant town line	Hot top -2007	6,000	New
Irish Road	Rt. 2 to Fuller Rd.	Cold pavement -2001	7,400	New
Horseback Road	Levant to end of new construction	New construction - 2005	3,815	Needs Surface
Horseback Road	New construction to Fuller Rd.	Hot top - 2006	6,840	New
Horseback Road	Rt. 2 to new construction	Hot top - 2001	7,100	Needs Surface
Horseback Road	New construction	Cold mix - 2003	1,600	good
Ash Hill	Rt. 69/dirt section	Hot top - 1999	2,200	Poor
Ash Hill	Gravel section	Gravel - 2008	3,800	Good
Hinckley Hill Rd.	Rt. 69 to Hermon town line	Hot top - 2009	6,300	New
Tom Murray Rd.	Newburg town line to new const.	Hot top - 2010	4,200	New
Tom Murray Rd.	New const. to end of pavement	Hot top - 2005	2,100	Needs Surface
Cook Road	Newburg town line to new pavement	Hot top - 2005	5,300	Needs Surface
Cook Road	New pavement	Cold mix - pre 1990	3,300	Poor
Cook Road	New pavement	Hot top - 2008	2,600	New
Cook Road	New pavement to Rt. 69	Cold mix - 1998	6,500	Poor
Town Office Safety Lane	Rt. 2 to Rt. 69	Hot top - 2009	800	New Pavement
Church Street	Rt. 2 to Rt. 69	Hot top - 2004	500	Needs Surface
Hayward Drive	Fuller Rd to end	Hot top - 2010	1,800	Needs Surface
Source: Carmel Town Manager, 2010/11				

Regarding the paving of gravel roads, the Town's current policy is to maintain the condition of existing paved roads and to maintain existing gravel roads as gravel roads. This is primarily due to the high cost of paving. This situation will probably not change in the future.

The Town's policy for accepting a private road as public road is that the road must meet the road standards in the Land Use Ordinance and Subdivision Regulations, which include paving. The road then must be accepted as a town road at a town meeting. This has not happened within the past 5 to 10 years, and appears to be the accepted policy of the community. The Town does not anticipate that this practice will change within the foreseeable future.

As an alternative to town-acceptance of private roads, Town officials encourage the formation of road associations to maintain private subdivision roads. Given that the roads standards in the ordinances are minimal, the Town may want to review them at some point over the next decade to bring them up-to-date with current standards.

Traffic Volumes: Annual Average Daily Traffic (AADT)

Annual Average Daily Traffic (AADT) is a measure of traffic volume that is determined by placing an automatic traffic recorder at a specific location for 24 or 48 hours; 24-hour totals are then adjusted for seasonal variations. Available traffic counts for Carmel roads are displayed in Table 5-2.

As would be expected the most heavily traveled highway in Carmel is the Interstate with AADTs of between 9,500 to nearly 10,000. The data suggest traffic volumes have generally increased since 2001 on the Interstate. U.S. Route 2/State Route 100 is the next most heavily traveled road in Carmel with AADTs ranging from 2,700 to 4,180 for the years displayed in the Table. Traffic volumes are highest at the Hermon town line, indicative of commuter and other traffic going to and from the greater Bangor area. State Route 69 between Carmel village and the Interstate had AADTs of between 1,340 and 1,720. Traffic volumes on Route 69 west of the village were less than 1,000 AADT. Of the Town's roads, Fuller Road near/at the Hermon town line had the highest traffic volumes with AADTs of between 850 and 1,250. Other town roads had AADTs of less than 1,000.

Table 5-2. Annual Average Daily Traffic Volumes

			Year				
Route	Station	Description	2001	2003	2006	2007	2008
U.S. Route 2/ State Route 100	32508	NW/O IR 2380	2,760	2,840	2,820		2,510
	54002/ 32502	NE/O IR 1845 @ Br. 2976 (Over Railroad)	3,330	3,160	3,500		3,080
	77700	@ Hermon town line	3,760		4,180		3,780
Inventory Route (IR) 404 (Fuller Road)	41600	@ Hermon town line		980	1,250		1,110
	65907	W/O IR 415 (Irish Road)		530	550		
	75207	W/O IR 522 (Five Road)		320	290		350
	75303	E/O IR 413 (Horseback Road)	780	760	890		850
IR 413 (Horseback Road)	75301	N/O IR 404 (Fuller Road)		530	510		
IR 522 (Five Road)	32501	N/O US 2/SR 100 @ Br. 5632 (Souadabscook Str.)	760	690	860		690
IR 535 (Cook Road)	42405	S/O IR 1234 (Marcho Rd.) @ Br. 5267 (Otis Br. - Kingsley)			200		230
IR 1234 (Marcho Road)	42407	W/O IR 535 (Cook Rd) @ Br. 0841 (Tracy Brook)			90		140
State Route 69 (Plymouth Road)	31604	SE/O IR 2018 (Hinckley Hill Road)	1,500	1,720	1,440		1,580
	31608	NW/O IR 2018 (Hinckley Hill Rd.) @ Br.	1,360	1,600	1,340		1,360
	32607	W/O IR 535 (Cook Road)	890	880	900		990
	32504	SE/O U.S. 2/S.R. 100	1,340				
Interstate 95 (South Bound)	52104	Cook Road Overpass	9,200	9,900	9,840	9,900	9,540
Interstate 95 (North Bound)	52104	Cook Road Overpass	9,160	9,820	9,790	9,810	9,530

Source: Maine Department of Transportation Traffic Count Books, 2005 and 2008

Major Traffic Generators

The most significant traffic generators in Carmel include:

- Carmel village (residences, businesses, town office, post office)
- Carmel Elementary School/ Administrative Building (Plymouth Road)
- Caravel Middle School (Irish Road)
- MDOT Bridge Maintenance Lot (Fuller Road)
- Acadia Auction Gallery in Newburgh (Route 2)
- Traffic volumes are greatest, as follows:
- Commuter traffic – primarily between 6-8 am and 4-6 pm
- Village activity is greatest during the day
- Schools are busiest during the school year, including during the evenings for sports and other activities.

Traffic and Safety Issues

Leading Crash Locations: MDOT has identified four leading crash locations for the years 2006 through 2008 within Carmel. Most of these crashes were vehicles running off the road (120 crashes), followed by collisions with deer (45) and rear-end collisions/sideswipes (35 crashes). The remaining 38 crashes included hitting an object in the road (17), intersection movement collisions (8), and head-on/sideswipe collisions (6). This information is displayed on the Transportation Map.

Table 5-3. Leading Crash Locations: 2006 - 2008

Node	Location Description	Number of Crashes 2006-2008
Node 39099	Intersection Irish Road and Route 2	3 crashes
Node 41270	Intersection Route 69 and I-95	3 crashes
Link Element 214798	Section of Route 69 southeast of village	15 crashes
Link Element 221528	Section of I-95 South Bound	17 crashes

Source: Maine Department of Transportation

A higher than expected number of traffic accidents at a particular intersection or section of road can indicate a need for road improvements. Eliminating dangerous conditions may require redesigning access onto the road, improving the sight distance, or alignment of the road. Other improvements include installing traffic lights, lowering speed limits, or providing road signs. As development in the vicinity of these areas occurs, the number of accidents can be expected to increase. Therefore, any decisions about proposed land use should recognize the existence of the high-accident areas and the need to remedy the problem before major development occurs.

In discussing safety issues in town, the Committee noted the following:

- Excessive traffic speeds were a concern noted in the prior comprehensive plan (1990), but have generally been resolved through increased enforcement by the Town's deputy sheriff.
- The intersection of Irish Road and Fuller Road: The Middle School, which generates considerable bus traffic, is north of this intersection. It was suggested that a four-way stop should be put in place at this intersection.

- There is frequently pedestrian traffic in the vicinity of the Carmel Recreation Area on Five Road (near the village). A sidewalk would be desirable in this area. It was also suggested that a sidewalk along the entire length of Route 2 would be desirable.
- The Horseback Road also has fairly heavy traffic due to MDOT Garage.
- The condition of Route 2 is so bad that everyone is using other Carmel Roads.

In general, traffic congestion is not an issue in Carmel. The most significant issue with regard to the carrying capacity of the town's roads is their overuse due to the poor condition of Route 2. However, road capacity issues related to population growth and increased traffic may arise in the future, and actions that the town can take to manage road capacity, such as managing the location and number of driveways, may be important to consider.

State Highway Projects

The Maine Department of Transportation Six-Year Plan lists several projects in Carmel (Table 5-4).

Table 5-4. State Highway Projects

Towns	Route	Length	Description
Carmel, Newburgh, Hampden, Hermon	I-95 Northbound	5.90 miles	Listed for FY 2010-2011 Work Plan (2009): Mill and Fill Plus: Beginning at 2.7 miles northerly of the Carmel town line and extending northerly 5.9 miles and including all ramps.
Carmel, Hermon	Route 2	3.78 miles	MDOT Six-Year Plan (2010-2015): Highway resurfacing beginning 0.14 miles westerly of Perry Lane and extending easterly 3.78 miles to 0.10 mile easterly of Hillcrest Drive.
Carmel	Route 2	1.25 miles	Under consideration for funding 2010-2013: Beginning .38 miles westerly of Davis Road and extending easterly 1.25 miles.

Source: MDOT, January 2010

Route 2 is particularly important to Carmel. Route 2 is a major east-west corridor and is a heavy haul road, which is consistent with its increasing use by cars and trucks. This type of traffic inflicts a considerable amount of wear and tear on the pavement that has resulted in extensive cracking and potholes. MDOT has re-constructed many portions of Route 2 and continues to do so as listed in the table above. The Town strongly advocates for ongoing upgrades of this major thoroughfare. It should also be noted that weight restrictions on the Interstate can impact the amount of truck traffic on Route 2. Currently, the Interstate weight limit is 80,000 pounds, but there has been an effort to increase that to 100,000 pounds, which would reduce the volume of trucks on Route 2.

Bridges

There are 24 bridges in Carmel according to MDOT's bridge inventory (See Table 6-5). The State owns and maintains 15 of these bridges; the Town owns and maintains 8 bridges. There is also one railroad bridge owned and maintained by the Pan Am Railroad. MDOT inspects bridges on a regular basis to determine their condition, assign a sufficiency rating, and determine if posting is necessary. Of the Town bridges, the Haskell Bridge (#0882) was replaced recently, and the Davis Road Bridge (#6376) is posted for a maximum of 36,000 pounds. Truckers are advised to avoid watch list bridges whenever possible, as increased truck traffic may hasten the need for posting.

Table 5-5. Bridge Inventory

	#	Name	Road	Over	Year Built	Structure Length	Suffici. Rate*	Posted	Comments
Town Bridges	0843	Garland Br.	Garland	Black Stream	1935	25'; 1 span	41.5	None	Watch list
	0844	Damon Mill Br.	Grist Mill	Souadabscook Str.	1970	31'; 1 span	52.0	None	Low use, re-dundant
	0882	Haskell Br.	Haskell	Black Stream	1940	24'; 1 span	-	None	Recently re-placed
	0883	Damascus Br.	Fuller	Souadabscook S.	1970	21'; 1 span	79.0	None	
	0841	Blagdon Br.	Marco	Tracy Brook	1998	9'; 1 span	99.0	None	
	6376	Davis Rd.	Davis	Harvey Stream	1994	43'; 2 spans	22.9	(36,000 lbs.)	Low use, re-dundant
	5267	Otis Bridge	Cook	Kingsley	1949	24'; 1 span	76.8	None	Low use, re-dundant
	5671	Lancey Br.	Cook	Kingsley	1956	21'; 1 span	81.8	None	
State Bridges	3985	Ruggles Br.	Rte. 69	Hill Brook	2003	24'; 1 span	98.5	None	
	1435	I-95 SB/Hill Br.	I-95 SB	Hill Brook	1963	31'; 1 span	96.5	None	
	1437	I-95 SB/Tracy Br.	I-95 SB	Tracy Brook	1963	20'; 1 span	96.5	None	
	2153	Cheese Factory	Rte 2/100	Souadabscook Str.	1923	18'; 1 span	90.3	None	
	1436	I-95 SB/Tracy Br.	I-95 SB	Tracy Brook	1963	19'; 1 span	96.1	None	
	2976	MCRR Crossing	Rt. 2/100	Railroad	1930	253'; 1 span	48.5	None	Replacement anticipated
	5102	Norton Br.	Fuller	Black Stream	1925	36'; 2 span	-	None	Recently re-placed
	5191	Tracy Br.	Rte 69	Tracy Brook	1949	33'; 1 span	66.4	None	
	5505	Philbrook Br.	Fuller	Harvey Brook	1963	28'; 1 span	78.9	None	Watch list
	5632	Five Rd. Br.	Five	Souadabscook S.	1955	23'; 1 span	74.6	None	
	5963	I-95NB/Tracy Br.	I-95 NB	Tracy Brook	1963	19'; 1 span	96.1	None	
	5964	Cook Rd/I-95	Cook	I-95	1963	388';6 spans	75.0	None	
	5965	I-95NB/Tracy Br.	I-95 NB	Tracy Brook	1963	20'; 1 span	96.5	None	
	5966	I-95NB/Hill Br.	I-95 NB	Hill Brook	1963	31'; 1 span	96.5	None	
	2356	Harvey Br.	R.2/100	Harvey Brook	1923	23'; 1 span	82.3	None	
RR	0853	Railroad	RR	Five Rd.					

* An indicator of the overall sufficiency of the bridge on a scale of 0 to 100 (100 = best, 0 = worst). The rating is computed with a federal formula using an array of condition and inventory data, and is used to identify bridges eligible for federal funding. The federal sufficiency rating includes both structural deficiencies as well as functional obsolescence. Since functional obsolescence (too narrow or low weight capacity) may account for a large portion of the rating, do not assume that a low sufficiency rating means the bridge could fail.

Source: MDOT Bridge Management Section, Feb. 2008, updated by Carmel Town Manager

Access Management

Many heavily traveled roads in Maine are lined with commercial and residential strip development and its associated driveways and entrances. This land use pattern can significantly reduce traffic speeds, traffic safety, and roadway efficiency. Access management is the planned location and design of driveways and entrances to public roads to minimize the impacts of curb cuts, provide for safe, efficient traffic movement. Access management combined with land use planning and regulation can be used to maintain the integrity of a transportation corridor.

Maine's access management law is applicable to all state highways in Carmel. The rules require state permits and set standards (sight lines, vertical alignment, driveway width, drainage, preference for entrances onto secondary roads, etc.) for the construction of driveways and entrances within MDOT's right-of-way, and require permits for new driveways and entrances on state roads. State permits are also required for changes in existing driveways and entrances, including changes of use. The Town is required by law to inform landowners and potential buyers of land requiring access to state roads of this permit requirement.

Carmel's Land Use Ordinance (Article IX.1.a.) requires that an Entrance Permit be obtained from the Town prior to the issuance of a building permit. The Road Commissioner is responsible for issuing Entrance Permits for all new driveways opened off town roads. Basic MDOT standards are applied, as appropriate, to include consideration of culvert size, visibility, entrance width. Currently, the Town does not have any formal written and adopted driveway/entrance standards for local roads. The Town Selectmen may want to consider adopting formal standards to assure consistency, sometime within the next ten years.

The Comprehensive Plan Committee indicated that the current system is adequate and that no changes were needed.

Public Parking

Carmel's public parking consists of parking at the Town Office, Post Office, schools, Recreation Area, and the Library. Additional parking for the Town Office is available at the Veteran's Memorial. Formal street-side parking in the village is minimal. The only parking need identified for the next decade is resurfacing the parking lot at the Recreation Area.

Pedestrian and Bicycle Facilities

There are no pedestrian or bicycle facilities in Carmel. Road shoulders are generally not wide enough to allow for safe pedestrian or bicycle use. Sidewalks have been suggested in the vicinity of the Recreation area and along Route 2, particularly in the village, but there is no funding for these types of facilities.

Air Transportation

The Bangor International Airport, located about 15 miles from Carmel, is the closest full-service airport. The Bangor International Airport provides national and international commercial passenger and cargo service as well as civil defense operations. The airport has an 11,441-foot main runway. Car rental services are available. The Town is not aware of any active public or private airports in Carmel.

Railroad

The railroad running through Carmel is the Pam Am Railways (formerly Guilford, Maine Central Railroad). Pan Am Railways is a freight carrier that operates over a network of about 2,000 miles of track in Maine, Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada's Atlantic provinces. The line has connections to eastern Canada via the Eastern Maine Railroad, to the west including Montreal and Chicago via the Montreal, Maine and Atlantic Railroad and to the south via Pan Am. There are no rail sidings in Carmel at this time. The only issue with the railroad is that the tracks block the Grist Mill Road.

Penquis Public Transportation

Penquis (social service agency based in Bangor) provides demand response and deviated fixed-route transportation services by van and light duty bus, and through private drivers, in Penobscot and Piscataquis counties. Service is available to all residents, but on a demand responsive basis to the following client groups, such as: children in protective care, senior citizens, people with physical handicaps, people with mental handicaps, and low income persons.

Penquis' LYNX is used to provide the door-to-door public and social service transportation in agency vehicles with service between Carmel and Bangor on Tuesdays each week. MaineCare-covered and other social service transportation is also offered in private vehicles with volunteer drivers.

These services will become increasingly important to the people of Carmel and the region as the overall population ages and becomes more dependent on public transportation to make necessary trips for goods and services, including medical services. The Town can provide information on these services at the Town Office.

Taxi and Intercity Bus Services

There is no taxi service located within the Town of Carmel. Taxi service is available from Bangor, but at a very high price. There is no intercity bus service that has stops in Carmel. There are several intercity bus companies that provide service from Bangor, including Cyr Bus Lines, Concord Trailways, Greyhound/Vermont Transit and West Transportation.

Other Transportation-related Issues

EMERGENCY EVACUATION ROUTES

Carmel's major routes (Route 2, Route 69, plus a few other minor connectors) and I-95 are the primary routes that would be used for any emergency evacuation. The type and location of the emergency would dictate which routes would be used. Carmel is in a very good location to funnel evacuation traffic in any direction for practically any natural and man-made emergency with the exception being an organized terrorist incident. The trains passing through Town several times per day on the railroad which crosses Route 2 at one location could be potentially problematic, but fortunately, there are other roads to by-pass any railroad emergency.

ENVIRONMENTAL AND CULTURAL CONSIDERATIONS

- **Noise Issues:** No transportation noise-related issues were identified by the Comprehensive Plan Committee.
- **Lighting Issues:** Carmel's land use ordinance contains regulations that specify the size, height and number of signs. These regulations do not address sign lighting or other lighting to assure that lighting not cause a traffic hazard. The Committee did not identify any lighting issues.
- **Scenic, Historic and Cultural Resources:** The Committee did not Identify any scenic, historic, or cultural resources within or adjacent to transportation facilities that it wants to protect.
- **Wildlife Habitat Issues:** Roads can create barriers to important wildlife travel corridors, and/or totally disrupt expanses of habitat. I-95 creates a significant barrier to wildlife, but this is a state issue. The Committee was not aware of any other wildlife habitat issues associated with roads.

CHAPTER 6. RECREATION AND OPEN SPACE

Overview

Recreation and open space are important for a community's quality of life. The availability of recreation opportunities, particularly those in the outdoors that entail access to rural land and water bodies, is a strong tradition in Maine communities. Recreational facilities, such as community buildings, ball fields, playgrounds, beaches and parks provide places where people can socialize and be active. Open space provides areas for outdoor recreation, such as access to water bodies for boating, fishing, swimming and ice skating, and trails for walking, horseback riding, snowshoeing, cross-country skiing, hiking, wildlife and bird watching, and snowmobiling and ATV riding. Open space provides areas for wildlife and contributes to the scenic beauty of the area. Regionally and locally, open space and other outdoor recreational offerings are considered economic assets for ecotourism and second/seasonal home development.

SUMMARY

Will existing recreational facilities and programs in the community and region accommodate projected changes in age groups or growth in your community?

Carmel has a formal recreation program run by a part-time Recreation Director. There are programs and facilities available for all ages. In general, the programs should serve the community well into the future. The Town continues to add programs as demand warrants, such as a possible need for more recreation and social activities for adults and seniors. The Town's Recreation Area is a centerpiece of the Town's outdoor recreational offerings.

Is there a need for certain types of services or facilities or to upgrade or enlarge present facilities to either add capacity or make them more usable?

The parking area at the Recreation Area should be expanded and paved. The Town would like to widen Five Road between Route 2 and the Recreation Area for pedestrian and bicycle use. The Town would also like to purchase the land on the railroad side of the recreation field when, and if it becomes available.

Are important tracts of open space commonly used for recreation publicly owned or otherwise permanently conserved?

The Town's Recreation Area is designed to serve this purpose.

Does the community have a mechanism, such as an open space fund or partnership with a land trust, to acquire important open spaces and access sites, either outright or through conservation easements?

Carmel does not currently have an open space fund or partnership with a land trust to acquire important open space. There does not appear to be a need for such an arrangement at this time.

Does the public have access to each of the community's significant water bodies?

The Town of Etna has developed a public access site on the western side of the pond. This should be adequate for the future. Public access to the Souadabscook Stream is available through the Carmel Recreation Area on a seasonal basis. Parking areas along Black Stream would be desirable.

Are recreational trails in the community adequately maintained? Are there use conflicts on these trails?

The Snowmobile Club maintains snowmobile trails in Carmel, and the Town is not aware of any problems associated with them. An ATV Club is now active in Carmel and will be developing trails.

Is traditional access to private lands being restricted?

Traditionally, many recreational activities (hunting, hiking, horseback riding, cross-country skiing, snowmobiling, ATVing, and access to streams and ponds for fishing and boating, etc.) have relied on the generosity of private landowners to allow the public to use their property for these activities. Posting of private land is an increasing issue in Carmel. Creating "no discharge of firearms" zones around the more populated areas of town is one option to consider for the protection of residents.

SUPPORTING DOCUMENTATION

Town Recreational Program

The Town of Carmel has a part-time Recreation Director who oversees the town's recreation program. The Town's recreation programs operate with a budget of around $33,000 per year (Library budget is around $19,500). The program includes the following activities:

- Senior Citizen Club Days (Monthly meetings)
- Carmel Days (One day a year)
- Recreation Programs (Year round)
- Simpson Memorial Library Programs

The Simpson Memorial Library is described in the Public Services and Facilities Chapter.

Inventory of Recreational Facilities

PUBLIC FACILITIES

Public recreational facilities include: the Carmel Recreation Area and facilities located at the Carmel Elementary School and the Caravel Middle School. School gyms are used for basketball and cheering.

The **Town's Recreation Area** consists of about 18 acres and is the primary public recreational facility in Carmel. It includes athletic fields (Little League, softball, baseball, combination football/soccer field), horseshoe pits, picnic tables and grills, tennis courts, playgrounds, a pavilion, and a gazebo. Currently the Town uses portable toilets. There are enough parking spaces for about 100 vehicles. The parking area should be expanded and paved. The Town would also like to widen Five Road between Route 2 and the Recreation Area for pedestrian and bicycle use.

Recreational Facilities at Schools: The Carmel Elementary School has a playground, gymnasium, an indoor basketball court, and open play field. The Caravel Middle School has a gymnasium, Little League

field, and basketball court.[26] The Town estimated that there are at least 50 parking spaces at each of these schools.

PRIVATE PROGRAMS AND/OR FACILITIES

One private recreational facility was identified by the Town. Shady Acres Campground is a privately owned campground located on 13 acres. Its facilities include a recreation hall, horseshoe pits, a swimming pool, and about fifty tent sites with space for vehicles.

The Beagle Club is an organization for interested dog owners. The Club owns a clubhouse and field which is used for training, field trials, other related activities.

The Snowmobile Club actively maintains a number of trails in Town and has a clubhouse that is also rents to other organizations.

Recreational Water Bodies and Public Access

Water bodies of recreational value in Carmel include Etna Pond, Souadabscook Stream and Black Stream. Providing public access to these resources is an important consideration.

Etna Pond is shared by three towns: Carmel, Etna and Stetson. The Pond is a total of 362 acres. There is no formal public access to the Pond in Carmel. A half-mile marshy outlet stream leads into Little Etna Pond and on to Etna Pond from a privately owned launching site off the westerly end of Fuller Road. There is also a launching site off the westerly end of Fuller Road. Another launching site of undetermined ownership exists in Carmel on the southeast corner of Etna Pond. The Town of Etna has developed a public access site on the western side of the pond. Etna Pond is very attractive for quiet boating, canoeing, fishing, and swimming. Waterfowl, furbearers, and warm water fish abound.

The **Souadabscook Stream**, which drains much of Carmel, has been identified as having a significant river resource value by the Maine Department of Conservation. This tributary to the Penobscot River offers three miles of canoeable flat-water from Route 2 in Carmel Village to Route 2 near the Hermon town line. A logical extension of this trip would be to continue on to Hermon Pond or cross over Route 2 and go down Black Stream into Hermon and, ultimately, the Kenduskeag Stream. Smallmouth bass and pickerel dominate the fisheries in this stream; brook trout are also present in lesser numbers. The Maine Department of Inland Fisheries and Wildlife stocks the stream with brook trout, which contributes to the streams value as a fishery. Public access to the Souadabscook Stream is available through the Carmel Recreation Area on a seasonal basis.

Black Stream offers two miles of canoeable flat-water from the Garland Road to Route 2. During periods of high water, further upstream in Levant are also canoeable. During periods of low water, shallow areas and old beaver dams make this a marginal canoe trip. Brook trout, suckers, pickerel, and minnows inhabit this stream. Parking areas along Black Stream are needed.

The two streams provide a total of 5 miles of canoeable water. Portions of the Harvey Stream, Hill Brook, and Tracy Brook are canoe able at some water levels but they do not offer extensive or reliable recreation.

[26] *Comprehensive Plan, 1990*

Trail Systems

Trail Systems: There are no formal hiking trails in Carmel.

Snowmobile Trails: The Carmel Snowmobile Club, an incorporated, non-profit organization, builds and maintains trails throughout Carmel. The trails are located on private property with the permission of the owners and are used for both snowmobiling and cross-country skiing. The Club also owns a building which they use for club functions and also rent for public use.

Carmel has traditionally passed along its share of the reimbursements from the state snowmobile registrations to the Carmel Snowmobile Club, usually about $1,200 per year.

All Terrain Vehicle (ATV) Trails: An ATV Club has been organized recently, and will be working to develop trails in Carmel.

Grants: The Maine Bureau of Parks and Lands Off-Road Division has funding available to assist in the development of trails.

Privately Owned Open Space and Recreation Land

There are many opportunities for outdoor recreation on private land in Carmel. Traditionally, many recreational activities (hunting, hiking, horseback riding, cross-country skiing, snowmobiling, ATVing, and access to streams and ponds for fishing and boating, etc.) have relied on the generosity of private landowners to allow the public to use their property for these activities. Often, as open land becomes more developed and built-up, this traditional access is no longer welcome, and in the case of hunting, not safe due to the close proximity of homes. Landowners may post land to prohibit certain uses, such as hunting or motorized vehicles, or may totally prohibit use of their property by the public.

Posting of private land is an issue in Carmel. “No discharge of firearms” zones around the more populated areas of town are one option to consider for the protection of residents.

In some communities non-profit organizations, such as land trusts, have sought to purchase either outright, or as conservation easements, land for open space and outdoor recreation.

Local and Regional Land Trusts in the Area

The following land trusts are active in Penobscot County:

- Bangor Land Trust
- Brewer Land Trust
- Forest Society of Maine
- Holden Land Trust
- Landmark Heritage Trust
- Maine Audubon
- Maine Coast Heritage Trust
- Maine Farmland Trust
- New England Forestry Foundation, Inc.
- Northeast Wilderness Trust
- Orono Land Trust
- Small Woodland Owners Association of Maine
- The Nature Conservancy in Maine

The Town is not aware that any of these organizations are active within Carmel.

Regional Recreational Opportunities

There are also numerous opportunities for recreation in the region surrounding Carmel. Downhill skiing is available in Hermon and cross-country skiing centers are located in Dixmont and Hermon. There are

numerous lakes, ponds, and streams in the region including, Lake Wasookeag, Little Pushaw Pond, Etna Pond, Hermon Pond, Pushaw Lake, Sebasticook Lake, Pleasant Lake, Plymouth Pond, and the Kenduskeag Stream. Peaks-Kenny State Park in Dover-Foxcroft and Fort Point in Stockton Springs are the two closet state parks in the area. State assisted boat launching facilities within the region consist of a canoe launching site on the Kenduskeag Stream in Kenduskeag and a boat launching site on Sebasticook Lake in Newport. Additional state sponsored boat launching sites include access to the Penobscot River in Brewer and Hampden and access to Stockton Harbor in Stockton Springs. Bass Park is also used by Carmel residents for 4-H Club activities.

CHAPTER 7. FISCAL CAPACITY

Overview

This chapter provides an overview of Carmel's financial situation in order to assess its fiscal capacity to meet the future needs of the community. A detailed financial analysis is beyond the scope of this plan, but a general assessment can provide some insight into the Town's overall ability to provide services and facilities to accommodate anticipated growth and development over the next decade. Financial information, including property valuations, tax rates, revenues and expenditures, long-term debt and capital budgeting are examined.

SUMMARY

In general, are tax revenues from new development offsetting the cost of needed additional services and capital investments?

The Town's increasing property valuation is an important trend that should continue. In general, property values appear to be increasing at a faster rate than municipal spending, which suggests that the Town will continue to be able to fund government services and facilities at the current level. As a bedroom community, the foundation of Carmel's tax base is its residential property, which may or may not be covering its associated costs for services. There are, however, a number of small to medium sized businesses that contribute to the tax base. The more diverse a town's tax base, the better able it is to pay for future expenses, particularly during difficult economic times.

What changes in the tax base are anticipated and how will it affect the town? What impact do tax exempt properties and tax incentive programs have on taxes?

The tax base is growing and based on population projections will probably continue to grow at a healthy rate. More business development would help assure a stronger tax base.

About 1.8% of the Town's valuation in 2008 was tax exempt, which is fairly typical for a small bedroom community. The only tax incentive programs used in Carmel are the Tree Growth and Farm and Open Space property Tax Programs.

How does the Town currently fund its capital investments? How will future capital investments identified in the plan be funded? If the Town plans to borrow to pay for capital investments, does the Town have sufficient borrowing capacity to obtain the necessary funds?

Budgeting for capital expenses occurs on a yearly basis where the Town Manager develops a budget that is reviewed and modified, as appropriate, by the Board of Selectmen and the Budget Committee. The recommended budget is then voted on at the Town Meeting. Carmel pays for capital expenditures through a combination of annual appropriations, saving ahead with reserve accounts, and borrowing. Carmel will likely continue to use all three of these approaches to fund future capital expenditures. Carmel has a small amount of long-term debt, and therefore has considerable borrowing capacity.

How do county and school administrative unit assessments and/or obligations affect local ability to finance proposed capital investments?

Education is the largest expense category in Carmel. Education expenditures accounted for about 37% of total municipal budget in 2009. County expenditures were about 6% of total municipal expenditures in 2009. School and County debts do not appear to be large enough to have a significant impact on the Town's borrowing capacity.

What efforts has the Town made to participate in or explore sharing capital investments with neighboring communities?

Carmel participates in a number of interlocal and regional agreements as described in the Chapter on Community Facilites and Services.

SUPPORTING DOCUMENTATION

Funding Government: Carmel's Tax Base

The foundation of a Town's fiscal health is the value of its property. The primary source of funding for municipal services and facilities is the property tax on land, buildings and personal property.

Carmel's locally assessed property valuation was $165,771,250 for 2009. This was an increase of $82,682,850, or an increase 84.5% in real dollars (when adjusted for inflation), between 2004 and 2008 (Table 10-1). The property valuation includes real estate (land and buildings) and personal property (equipment, etc.). A significant proportion of this increase was the result of a full revaluation in 2007 which adjusted property values to be consistent with market trends. The revaluation increased the overall valuation of the Town by $74 million.

The state assessed valuation is a better measure of the increased value of property over time, because it is annually adjusted to reflect current market trends. The state valuation is an "equalized" valuation used to calculate state revenue sharing, state aid for education, and the county tax. According to the Town Manager, Carmel's valuations are currently close to 100% of the state valuation, which means that property values are up-to-date with current market trends.

Carmel's state assessed valuation increase by $47,550,000 between 2004 and 2008, or by 26.6% in real dollars. Carmel's property tax commitment (the amount of property tax income needed to fund budgeted expenses) between 2004 and 2008 increased by $278,387 (a 5.5% increase in real dollars).

The Town's tax rate appears to reflect the change in valuation as a result of the revaluation in 2007. It went from 20 mils in 2006 to 10.5 mils in 2007. Since then the mill rate has increased to 11.75 mils.

Table 7-1. Property Valuation and Taxation

Fiscal Year	Local Assessed Valuation	State Assessed Valuation	Property Tax Commitment	Tax Rate per $1,000
2004	$83,088,400	$117,300,000	$1,437,973	18.00
2005	$83,672,200	$131,550,000	$1,608,730	20.00
2006	$87,760,350	$150,350,000	$1,697,648	20.00
2007	$168,864,100	$157,850,000	$1,649,738	10.50
2008	$164,834,750	$164,850,000	$1,716,360	10.70
2009	$165,771,250	Not available	$1,895,053	11.75
# Chg 2004-08	$81,746,350	$47,550,000	$278,387	-
% Chg. 04-08 Adj.	84.5%	26.6%	5.5%	

The Town's increasing valuation is an important trend that should continue. It will give the Town the capacity to provide the services needed for the future prosperity of the community, including anticipated growth and development.

The more diverse a town's tax base, the better able it is to pay for future expenses, particularly during difficult economic times. As a bedroom community, the foundation of Carmel's tax base is its residential property. There are, however, a number of small to medium sized businesses that contribute to the tax base.

Table 7-2. Summary of Tax Exempt Property for Carmel	
Category	Valuation
State of Maine	$370,900
Public/Municipal	$949,200
Library/Scientific	$137,500
Churches and Parsonages	$647,700
Fraternal Organizations	$380,200
Legally Blind	$4,000
Veterans [Exemption]	$517,000
Total	$3,006,500
Source: Municipal Valuation Return, 2008	

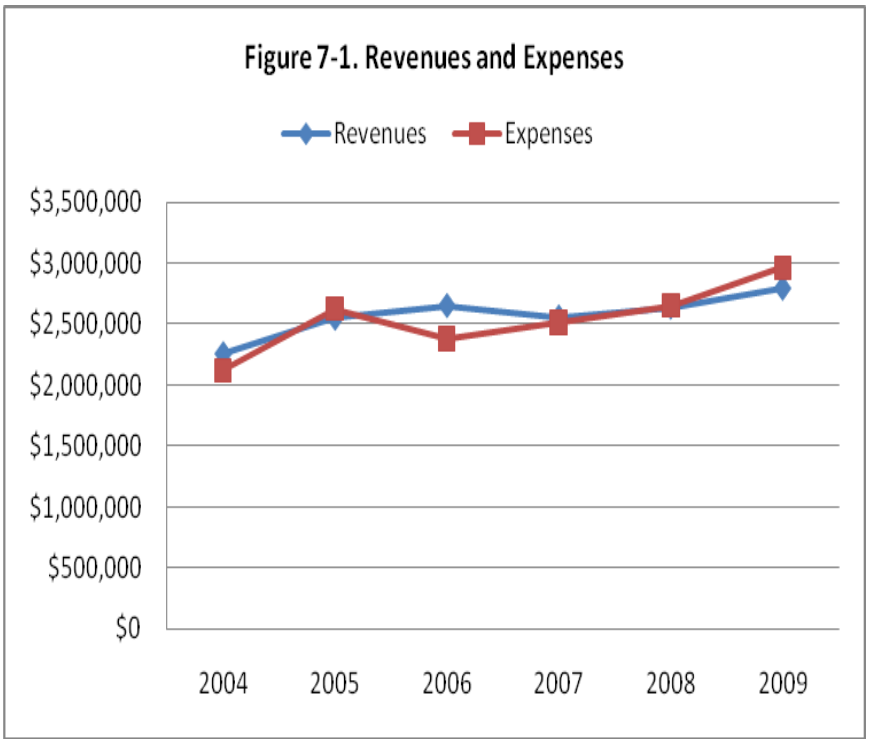
Tax Exempt Property

The total valuation for tax-exempt property in Carmel was $3,006,500, which was about 1.8% of the total valuation in 2008. Tax-exempt property equaled about $32,000 in uncollected revenue for the Town in 2008.

This amount of tax exempt property is fairly typical for a community like Carmel.

Revenues and Expenses

General fund revenues and expenses are usually revenues that are raised or received on an annual basis, and expenses that are incurred on an annual basis. The following analysis examines the trends in both revenues and expenditures over the past six years in an effort to predict future trends and issues for the Town.



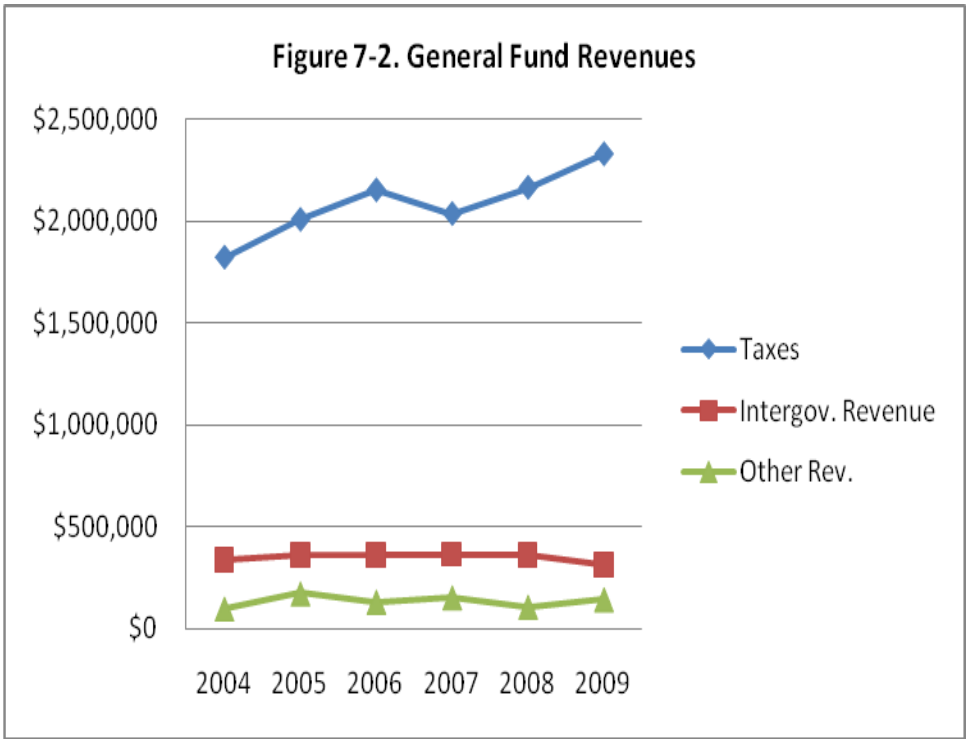
All figures for this analysis come from the Town Audits, and are used to present an overall perspective of revenue and expenditure trends. Caution should be used in interpreting the details of the data because there may be slight variations in the categories from year to year. For example, the 2009 audit reflects a slight change in categories as a result of a different auditor that year.

Typically, revenues and expenditures are aligned, with some variations from year to year depending on accounting from one year to the next. Figure 7-1 displays total general fund reve-

nues and expenditures for the years 2004 through 2009. Total general fund revenues in 2009 were almost $2.8 million, which was up from $2.3 million in 2004. This was an increase of nearly 10% in real dollars (adjusted to account for inflation). Total general fund expenditures were about $2.9 million in 2009 as compared to about $2.1 million in 2004. This was a 26% increase in real dollars from 2004 to 2009. The significant increase in expenditures in 2009 skews the percentage increase upward. The 2009 expenditures include the Fuller Road construction project, payment of the 2005 road improvement loan, and the cemetery expansion - all in that year. This will be explained in more detail later in this chapter.

Revenues

Taxes, and primarily property taxes, are the major source of revenue for the Town. They accounted for 83.5% of revenues for fiscal year 2009. Property taxes increased by about $507 million (14.2% in real dollars) between 2004 and 2009 (Table 7-3).



Intergovernmental revenue primarily includes state revenue sharing and state road assistance, with Tree Growth, Homestead exemption, and veterans' reimbursements, as well. Intergovernmental revenues accounted for 11.3% of revenues in 2009. These revenues decreased by $22.6 thousand between 2004 and 2009. These revenues actually increased to $366 thousand in 2007. Budgetary shortfalls in state government in recent

Table 7-3. General Fund Revenues: 2004 – 2009 for Carmel

	2004	2005	2006	2007	2008	2009	$ Chg.	% Chg. Adj[2]
Taxes[1]	$1,822,383	$2,008,083	$2,152,556	$2,036,450	$2,165,144	$2,329,659	$507,276	14.2%
Intergov. Rev.	$336,829	$363,870	$362,196	$366,021	361,405	$314,205	-$22,624	-20.3%
Other Rev.	$100,618	$174,832	$134,217	$155,491	$110,097	$146,131	$45,513	31.6%
Total	$2,259,830	$2,546,785	$2,648,969	$2,557,962	$2,636,646	$2,789,995	$530,165	9.9%

[1] Includes property taxes and excise taxes.
[2]Adjusted for inflation, which accounted for 13.6% of the change between 2004 and 2009.
Source: Town Audit Reports, 2004-2009

years have resulted in less money coming from the state to local governments.

Other revenue includes charges for services (licenses, fees, etc.), interest income, bond proceeds, and other miscellaneous revenues. Other revenue accounted for 5.2% of income in 2009. These revenues increased by almost $46,000, or by 3% when adjusted for inflation, between 2004 and 2009.

In the future, property taxes will continue to provide most of the revenue needed to support government services, which is why an increasing property valuation is so important. Intergovernmental revenues, which include state revenue sharing, local road assistance and the Homestead reimbursement, have been decreasing over the past several years due to budget cuts at the state level. This trend will likely continue as long as there is an economic recession that limits state revenues.

Expenditures

The single largest expense category for Carmel is education/county, of which education is by far the Town's greatest expense. Public works, which is road expenditures, is the next most significant category of expenses, followed by administration.

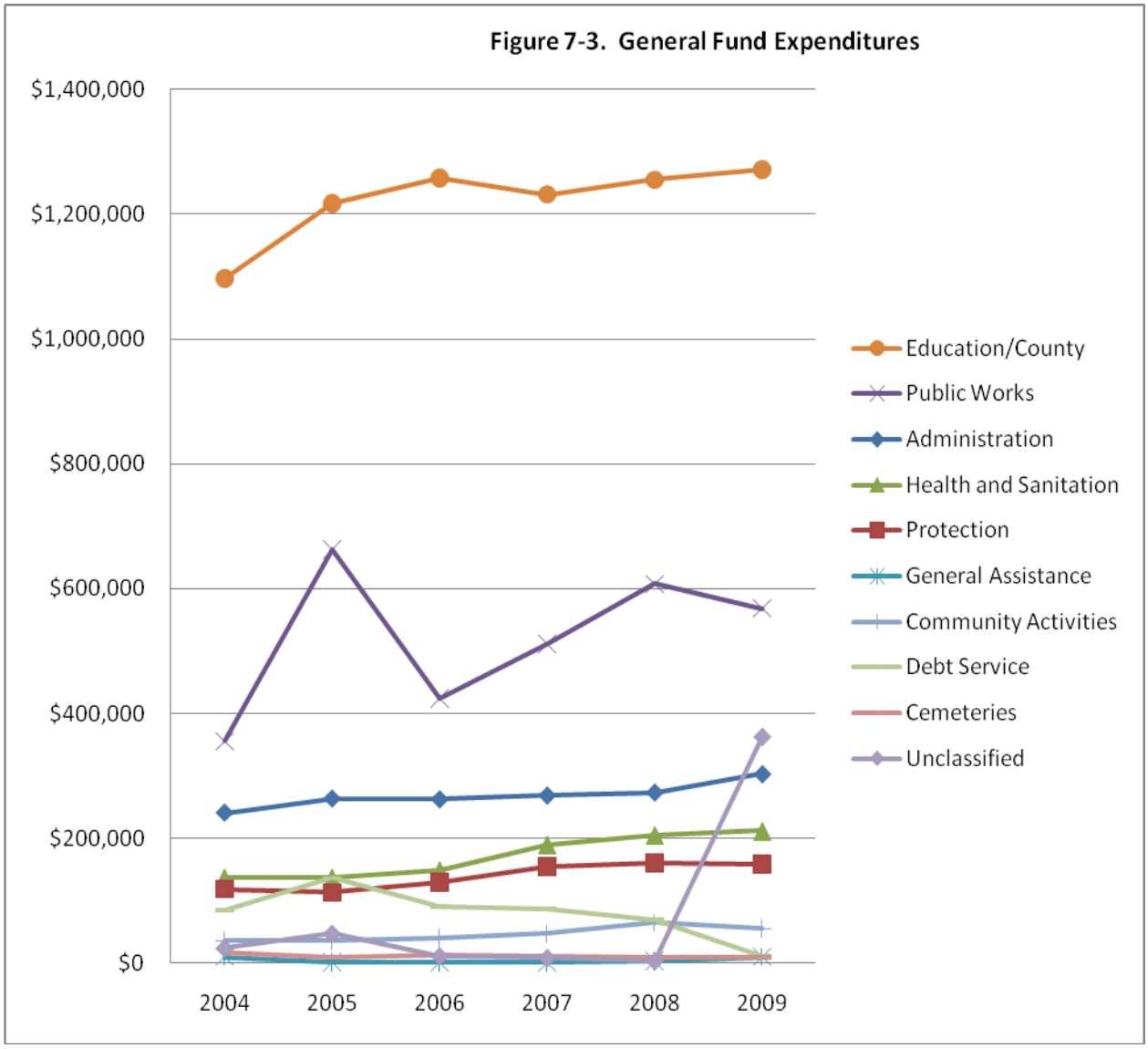
The following examines the expense categories that have the greatest impact on the Town's budget:

- Education expenditures ($1.1 million in 2009) and the County tax ($169,000 for 2009) are grouped together, and increased by $173,643, or by 2.2% between 2004 and 2009. Education expenditures accounted for about 37% of total expenditures in 2009.
- Public Works (roads) constitutes the next largest expense category at $569,000 in 2009. While up by 46% from 2004 expenditures, it is actually lower than 2005 and 2008 expenditures for public works. However, in 2009 the Fuller Road construction project ($215,000) and payment of the 2005 road improvement loan ($105,000) are included under the unclassified category. These projects are/were being paid for through loans.
- Public works expenditures have been impacted dramatically by factors such as, the contracts for the cost of paving, fuel, and sand/salt.
- Town Administration, which includes personnel expenses, insurance, building maintenance, office supplies, etc. is the next largest expense category at $303,000 in 2009. Administrative expenses increased by 12.3% between 2004 and 2009.
- Rubbish disposal, the single largest expense category under Heath and Sanitation was $207,000 in 2009. Expenses in this category increased by almost 41% from 2004 to 2009, primarily due to increases in contracts and the cost of hazardous waste disposal.
- The Protection category, which includes police, fire and ambulance services, was almost $159,000 for 2009. This was an increase of about 20% over 2004 expenses. Reasons for this increase include the addition of a sheriff's deputy for 40 hours of converge.
- Under the Unclassified category, in 2009 the total was $362,144, which greatly skewed the calculated increase since 2004. This figure includes the Fuller Rd. construction project ($215,000), payment of the 2005 road improvement loan ($50,000), and the cemetery expansion ($30,000).

Table 7-4. General Fund Expenditures: Fiscal Years 2004 - 2009								
Category (Largest expense categories)	2004	2005	2006	2007	2008	2009	$ Chg.	% Chg[5]
Administration[1] (personnel, insurance)	$240,729	$263,742	$262,356	$268,577[2]	$273,5032	$303,197	$62,468	12.3%
Protection (Police, Fire, Ambulance)	$118,513	$112,953	$129,826	$154,235	$160,733	$158,781	$40,268	20.4%
Health and Sanitation (Rubbish Disposal)	$137,338	$137,183	$148,839	$190,007	$205,551	$212,136	$74,798	40.9%
Public Works (Roads)	$355,649	$662,673	$423,990	$511,716	$607,803	$568,511	$212,862	46.3%
General Assistance	$9,855	$1,660	$1,343	$538	$2,942	$10,030	$175	-15.4%
Education/ County Tax	$1,097,577	$1,217,600	$1,257,802	$1,231,894	$1,255,302	$1,271,220	$173,643	2.2%
Community Activities (Recreation, Library)	$36,057	$35,385	$40,286	$46,961	$64,496	$55,428[3]	$19,371	40.1%
Cemeteries	$16,491	$9,567	$12,605	$10,133	$8,496	$9,218	-$7,273	-57.5%
Debt Service	$84,059	$136,237	$91,405	$87,030	$69,470	$11,917	-$72,142	72.2%
Unclassified (Capital Projects, Revaluation, etc.)	$24,281	$47,277	$11,383	$8,745	$3,617	$362,144[4]	$337,863	1,378%
Total	$2,120,549	$2,624,277	$2,379,835	$2,509,836	$2,651,913	$2,962,582	$842,033	26.1%

[1]Includes insurance and benefits
[2]Includes "contingency" category for those years.
[3]Listed as "Recreation" instead of Community Activities does not include Library, which is in "unclassified".
[4] Includes Fuller Rd. construction ($215,000), 2005 road improvement loan ($105,000), cemetery expansion ($30,000), and other normal unclassified expenses.
[5]Inflation accounted for 13.6% of the change between 2004 and 2009.
Source: Town Audit reports, 2004-2009

Conservative municipal fiscal policies can help control future expenditures where the Town has control over costs. The Town has little control over school and county budgets, as well as the costs of energy, fuel, and other services and supplies, where there is limited choice in vendors.



Long Term Debt and Borrowing Capacity

Two indicators of a town's fiscal capacity are its debt load and its growth in property valuation. Carmel's property valuation increased by 26.6% between 2004 and 2008, and continued growth is anticipated, even in the current economic recession. The Town is also carrying a relatively small amount of debt, which means it has considerable untapped borrowing capacity, as discussed below.

The Town's long-term debt as of December 31, 2009, was $307,723 (principal) (Table 7-5). Annual debt service (principal and interest) is displayed in Table 10-7.

Table 7-5. Long Term Debt				
Description	Date Issued	Interest Rate	Maturity Date	Balance (Principal) 12/31/09
United Kingfield Bank Note for School Garage Construction	1998	4.95%	Oct. 2013	$42,723
Camden National Bank General Obligation Bond for Roads	2009	3.65%	Aug. 2014	$265,000
Total				$307,723
Source: Auditor's Report, FY 2009				

Table 7-6. Annual Debt Service (Principal Plus Interest)	
Year Ending Dec 31	Debt Service
2010	$21,589
2011	$21,589
2012	$21,589
2013	$21,589
2014	$270,642
Total	$356,998
Source: Auditor's Report, FY 2009	

The Town is also responsible for its proportionate share of school and county debt. The Town's share of county debt is 2.32%, but as of December 31, 2010 the county did not have any debt. The Town's proportionate share of school debt is 52.3%. As of June 31, 2010, school debt consisted of a general obligation bond of $1,686,475 and a capital lease agreement for $82,439. While the Town's share of this debt would be $884,457, it was noted by the school superintendant that a significant portion of the debt is attributable to the Suzanne Smith School, and would be paid for by the state.

State law requires that a town's total debt not exceed 15% of the most current valuation. It should be noted that any town approaching the 15% threshold would be stretched well beyond its means. Even if the total amount of school debt combined with the Town's own debt is used, the Town still has a modest amount of debt. The Town's current combined debt is $1,192,000, which is 0.7% of its 2009 valuation ($165,771,250).

Budgeting for Capital Expenditures

The Town's process for budgeting for capital expenses occurs on a yearly basis where the Town Manager develops a budget that is reviewed and modified, as appropriate, by the Board of Selectmen and the Budget Committee. The recommended budget is then voted on at the Town Meeting.

The Town's approach to funding capital projects has been a combination of a "pay-as-you-go" approach where funds are raised annually as needed, a "save ahead"

Table 7-7. Carmel Reserve Accounts	
Account	Balance as of 12/31/10
Building Reserve	$6,481
Equipment Reserve	$101,289
Comprehensive Plan Reserve	$9,415
CTV Reserve	$13,742
Bridge Reserve	$53,855
Cemetery Lot Sales Reserve	$14,263
Tax Revaluation	$25,165
Disaster Reserve	$2,903
Bicentennial Reserve	$8,153
Carmel Day Reserve	$7,368
Cemetery Trust	$36,370
Ministerial Trust	$10,649
Library Trust	$1,127
Total	$290,780

approach with reserve accounts intended for future expenditures (Table 7-7), and a "borrowing and paying into the future" approach (Table 7-5). Many of the town's capital improvements are funded through annual appropriations at town meetings, including 2.5 miles of paving and .25 miles of construction. Carmel has borrowed money for the school garage construction and for road construction projects. Carmel will likely continue to use all three of these approaches to fund future capital expenditures. Other potential sources of funds include grants, lease-purchase agreements, and impact fees.

Future Capital Needs

Road construction, including paving, is the single largest, ongoing, and most challenging capital need in the Town. The Town utilizes state road assistance, annual appropriations and loans to attempt to adequately maintain its roads.

Other potential capital projects are discussed in the Public Facilities and Services Chapter, and are incorporated into the Capital Investment Plan.

CHAPTER 8. WATER RESOURCES

Overview

Clean, abundant water is an essential resource in any community. Ground water from individual private well is the primary source of drinking water in Carmel. Surface water resources in Carmel include Etna Pond and numerous streams and wetlands. In general, water resources in Carmel are plentiful and clean. This chapter inventories and assesses the health of ground and surface water resources.

SUMMARY

Are there point sources (direct discharges) of pollution in the community? If so, is the community taking steps to eliminate them?

Point discharges from septic systems on small lots in the village area are a major concern, and an issue the Town would like to address. Currently, Carmel does not have a public water or sewer system in this area.

Are there non-point sources of pollution related to development, agriculture, forestry or other uses that are affecting surface water resources and riparian areas? If so, are existing regulations sufficient to protect these resources?

The Town is not aware of any non-point sources of pollution that are affecting surface water resources.

The Town could provide more protection to water resources through additional standards in the Land Use Ordinance to address erosion control and clearing of vegetation, oil and chemical storage, refuse disposal, sand and gravel extraction, and other potentially polluting activities that are not necessarily covered in state laws.

Are point and/or non-point sources of pollution threatening groundwater supplies?

There are several non-community public water supplies that have been contaminated by coliform bacteria usually associated with septic systems. Several of these water supplies have septic systems, parking lots and/or fuel storage tanks located nearby.

Are public groundwater supplies and surface water supplies and their recharge areas adequately protected? Are any public water supply expansions anticipated? If so, have suitable sources been identified and protected?

Carmel does not have a community public water supply. There are several non-community public water supplies (campgrounds, mobile home parks, schools) that receive some protection through state law. Carmel should amend its land use regulations to provide additional protection for public water supplies, as required by state law.

What non-regulatory measures can the community take to protect or enhance water quality? Are there opportunities to partner with local or regional advocacy groups that promote water resource protection?

Carmel can educate landowners about the importance of protecting water quality. Publications can be made available at the Town Office, Library and through the schools.

The Town could encourage the organization of an Etna Pond Lake Association.

Carmel's Code Enforcement Office could become certified in Maine DEP best management practices for erosion control, and work to educate landowners on water quality protection for the Pond and streams through the permitting process.

The Public Works director could become certified in DEP best management practices and/or require that public works crews and contractors use best management practices in daily operations (e.g. salt/sand pile maintenance, culvert replacement, ditching, street sweeping, etc.)

SUPPORTING DOCUMENTATION

Groundwater Resources (Aquifers)

Groundwater is the major source of drinking water in Carmel and is pumped from individual wells. Groundwater resources (called aquifers) may be of two types: bedrock aquifers, and sand and gravel aquifers. A bedrock aquifer is generally adequate for small yields. A sand and gravel aquifer is a deposit of coarse-grained surface materials that, in all probability, can supply large volumes of groundwater.

The Maine Geological Survey has identified one "significant sand and gravel aquifer" in Carmel. "Significant sand and gravel aquifers" have water yields that might be suitable for public water supplies or for uses that require significant quantities of water. This aquifer is associated with Black Stream and was identified as having a yield of between 10 to 50 gallons per minute **(See Appendix - Significant Aquifers and Wetland Characterization Map).**

It is important to protect groundwater from pollution and depletion. Once groundwater is contaminated, it is difficult if not impossible to clean. Contamination can eventually spread from groundwater to surface water and vice versa. Thus, it is important to take measures to prevent contamination before it occurs. The primary sources of ground water contamination are malfunctioning septic systems, leaking fuel storage tanks, vehicle accidents, salt leachate from sand/salt stockpiles, and leachate from landfill refuse. Spills associated with junkyards and other commercial and industrial uses, certain agricultural activities, construction activities, and road and parking lot runoff can also pose as threats. In addition, things as diverse as golf courses, cemeteries, dry cleaners, burned buildings, and automobile service stations are also potential threats to groundwater.

Carmel's sand/salt shed is covered and the old landfill has been closed, which limits potential contamination from these sources. Septic systems and some of the other uses above could also potentially be threats to groundwater.

Groundwater quality has been a concern in the village area of Carmel because of the small lots sizes. There were two wells in the village that were contaminated from the old gas station that is now Seafood Galley. The Maine DEP drilled a new well to provide water to the two homes.

Carmel could add regulatory standards to protect this aquifer and groundwater, in general. Aquifer protection standards often prohibit uses that potentially could be serious threats and seek to maintain aquifer recharge by limiting the size of impervious areas.

Public Water Systems

A "public water system" is defined by state and federal statute as one that serves 25 or more people for 60 or more days per year. There are three types:

- "Community Water Systems" serve people in their place of residence (town water supply).
- "Non-Transient Non-Community Water Systems", serve schools, office buildings, etc.
- "Transient Non-Community Water Systems", serve a constantly changing, transient population, such as systems associated with motels, restaurants and campgrounds.

Carmel does not have a community public water supply. However, there are a number of "non-community water systems" (Table 8-1).

Federal and state regulations require owners of public water supplies take steps to protect their wells. Septic systems must be located at least 300 feet from wellheads, and underground fuel storage tanks must be at least 1,000 feet away from wellheads. Further, the law requires that towns notify public water suppliers of certain proposed activities occurring on nearby properties, such as automobile graveyards, recycling businesses, junkyards, septic system expansions or replacements, activities requiring a Maine Natural Resource Protection Act Permit or a State Stormwater permit, subdivisions, and other land use projects. In general, in any situation where a permit is required, any nearby public water suppliers should be notified of the project. Carmel's land use ordinances should be amended to include reference to the above state law.

Table 8-1. Public Well Assessments for Public Wells in Carmel - May, 2003					
Location	Well Type and Depth	Wellhead Protection Radius	Contamination Risks	Test Results*	Potential Threats (distance from well-head)
Caravel Middle School	Bedrock - 212'	500’	High risk for chronic contamination		Septic system within 300’ of well; Parking lot at 30’
Carmel Elementary School	Bedrock - 430'	300’	High risk for chronic contamination	Positive coliform	Septic system within 300’; parking lot at 20’
	Bedrock	300’	High risk for chronic contamination	Positive coliform	Septic system within 300’; Underground oil storage tank at 30’
Grandeur Mobile Home Estates	Bedrock (3) – 610’, 125’, NA	+300’	High risk for chronic contamination		Aboveground oil storage tanks
Seafood Galley Restaurant	Bedrock - 90'	300’	Moderate risk for acute contamination	Positive coliform	Septic system within 300’
Shady Acres RV Campground	Bedrock - 260'	300’	Low risk for risk of acute contamination		
Pastimes Fitness Center	Bedrock	300’	Moderate risk for acute contamination	Positive coliform	
South Slope Estates Mobile Home Park	Bedrock	300’	High risk for chronic contamination		Unknown
* Test results prior to May 2003. Source: Maine Drinking Water Program					

Major Surface Water Watersheds

An understanding of the Town’s watersheds is important when considering surface water quality which can be negatively impacted by activities within the watershed. The Town of Carmel lies entirely within the Penobscot River Basin, which is New England’s second largest river system. The Penobscot River drains an area of 8,570 square miles. Sub-watersheds for the Town’s ponds and streams are displayed on the Water Resources Map.

Water Quality of Surface Waters

Carmel has an abundance of water. In general, water quality is relatively good due to the Town’s rural nature and forested land cover. Undisturbed forest land is about the least polluting form of land cover in terms of nutrients and sediments lost to surface waters. Sediment is usually the single greatest pollutant by volume in most watersheds. Roadside runoff, gravel pit runoff and stream bank erosion are major contributors of sediment to surface waters. Road crossings (bridges and culverts) can contribute significant amounts of polluted runoff to streams.

Other threats to water quality include nutrients and pathogens from improperly maintained septic systems; pathogens, nutrients, sediment and toxic substances, such as heavy metals from storm water runoff from developments; landfills; salt storage sites; underground storage tanks; hazardous materials spills; and litter.

Agricultural and timber harvesting activities can also impact water quality. Most non-point source pollution from agriculture occurs during the fall, winter and spring when the ground is frozen. Agricultural activities that can contribute pollution include livestock wading in streams, barnyard runoff, farmland eroding into adjacent watercourses, and improperly applied fertilizers, pesticides and water management practices. Timber harvesting activities, such as the layout of roads and skid trails, location of landings and stream crossings, can also contribute to water quality problems, particularly when these activities are conducted on steep slopes.

WATER QUALITY OF RIVERS AND STREAMS

Maine has four water quality classes of rivers and streams: AA, A, B, and C (38 MRSA § 465)(Table 8-2). Each classification assigns designated uses and water quality criteria, and may place specific restrictions on certain activities such that the goal conditions of each class may be attained. There is actually not much difference between the uses or the qualities of the various classes because all attain the minimum fishable-swimmable standards of the federal Clean Water Act. Most support the same set of designated uses with modest variations. The classification system is really a hierarchy of risk, more than one of use or quality, the risk being the possibility of a breakdown of the ecosystem and loss of use due to either natural or human-caused events.

Ecosystems that are more natural can be expected to be more resilient to a new stress and to show more rapid recovery. Classes AA (rivers and streams) and GPA (lakes and ponds) involve less risk since activities, such as waste discharges and impoundments are prohibited. The expectation to achieve natural conditions is high and degradation is therefore less likely. Class A waters allow impoundments and very restricted discharges, so the risk of degradation, while small, does increase since there is some human intervention. Class B rivers and streams have fewer restrictions on activities but still attempt to maintain high water quality criteria. Finally, Class C has the least restrictions on use and the lowest (but not low) water quality criteria. Class C waters are still good quality, but the margin for error before significant degradation might occur in these waters in the event of an additional stress being introduced (such as a spill or a drought) is the least.

Souadabscook Stream is a class AA water body, so ranked because it is spawning and rearing habitat for Atlantic salmon. The water quality of Etna Pond directly impacts Souadabscook Stream. All other streams in Carmel, including Tracy Brook, Hill Brook, Slate Quarry Brook, Black Stream, Harvey Stream, are designated Class B water bodies. All waters in Carmel attain their water quality classification. **(See Appendix – River and Stream Classifications (Watersheds) Map)**

Table 8-2. Maine Water Quality Classification System for Rivers and Streams			
Class	Designated Uses	Habitat	Aquatic Life (Biological) Narrative Criteria**
AA	Aquatic life; drinking water; fishing; recreation	Free flowing and natural	No direct discharge of pollutants; as naturally occurs
A	Aquatic life; drinking water; fishing; recreation; navigation; hydropower; industrial discharge	Natural	As naturally occurs
B		Unimpaired	Discharges shall not cause adverse impact to aquatic life in that the receiving waters shall be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes to the resident biological community.
C		Habitat for fish and other aquatic life	Discharges may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.
Source: Maine Department of Environmental Protection			

ETNA POND

Etna Pond, located in the northwestern corner of Carmel, is shared with Etna and Stetson. The pond is about 362 acres in size. Not quite half of Etna Pond is located in Carmel. The Pond's outlet is to Souadabscook Stream which then drains into the Penobscot River.

Etna Pond is a "great pond". Maine statute has designated one standard (GPA) for the classification of great ponds. Specifically, Class GPA waters must be suitable for drinking water after disinfection, recreation in and on the water, fishing, industrial process and cooling water supply, hydroelectric power generation and navigation and as habitat for fish and other aquatic life. The habitat is characterized as natural, and must be free of culturally induced algal blooms which impair their use and enjoyment. The number of Escherichia coli bacteria of human origin in these waters may not exceed minimal levels. There may be no new direct discharge of pollutants into Class GPA waters, other than those that are legally exempt. The statute further states that no activities or land uses may take place on the banks of the water body or in the watershed that might degrade the water quality below the attainment level of the classification.

Table 8-3. Etna Pond Morphometry and Geographic Information							
Area	Perimeter	Mean Depth	Maximum Depth	Volume	Direct Drainage Area	Total Drainage Area	Flushing Rate
362 acres	33,991 feet	6 feet	12 feet	1,936.21 acre-feet	7.96 square miles	19.9 square miles	8.08 times per year
Source: Senator George J. Mitchell Center for Environmental and Watershed Research							

The water quality of Etna Pond is mesotrophic. This means that it is shallow, relatively warm, has nearly the same temperature from the top to the bottom, is brown in color, and is highly productive. Algae blooms are not common in Etna Pond now, but its physical and chemical

characteristics are such that shoreline development or increased farmland runoff could cause rapid water quality deterioration and this in turn could lead to unsightly and unhealthy algae blooms and perhaps fish kills.

The most serious threat to lakes and ponds is phosphorus pollution. Restoration of polluted ponds is extremely expensive, and some ponds may never recover. Development in the form of roads, buildings, lawns, farms, timber harvesting and other human activities that eliminates vegetation and natural depressions, allows rainwater to flow more quickly and directly into ponds. Increased runoff can carry excessive amounts of phosphorus into ponds (up to 10 times as much as normal). Phosphorus is a natural element found within the soil, which is found in concentrated amounts in fertilizers, detergents, manure and sewage. Rainwater runoff carrying excessive amounts of soil and any of these materials can greatly increase the amount of phosphorus in a pond. The negative impacts from excessive phosphorus can be loss of fisheries, cloudy green waters with unpleasant odors that lose their appeal for swimming and boating, and a resultant reduction in property values. So, generally speaking, the more developed a pond's watershed is, the higher its phosphorus concentration will be.

The simplest way to reduce phosphorus export is to limit clearing of vegetation and minimize the area developed. Beyond this, a variety of control measures are available. They generally focus on detaining and storing storm water where it can be treated and released or infiltrated into the soil. Buffer areas are naturally vegetated areas preserved down slope of developed areas. These buffers intercept and store surface runoff, allowing it to infiltrate rather than flow offsite as surface flow. Development can proceed in pond watersheds without generating more phosphorus than the pond can tolerate by limiting the extent of development and incorporating one or more of these phosphorus controls.

There are two steps for keeping phosphorus low and water quality high for ponds. First, existing sources of phosphorus need to be minimized, particularly from soil erosion in the watershed and from inadequate shoreline septic systems. The second requirement is that new additions of phosphorus to the pond that result from residential and commercial growth in the watershed needs to be minimized. The Maine Department of Environmental Protection (MDEP) has developed a methodology, described in the manual Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development, to evaluate whether or not a proposed development will add a disproportionate amount of new phosphorus to a pond. It provides a standard that limits the amount of phosphorus a proposed new development can add to a pond and a means by which the development can be designed and evaluated to insure that it meets the standard for that pond.

Table 8-3 provides phosphorus allocations[27] for Etna Pond. The bottom two columns of the table are the most important. The next to last column indicates an estimated per acre phosphorus allocation in pounds of phosphorus per acre per year (lb/acre/yr) for the pond watershed.

This allocation can serve as a standard for evaluating new development proposals. It is applied to the area of the parcel of land being developed to determine how much the development should be allowed to increase phosphorus loading to the pond. For instance, a development proposed on a 100 acre parcel in a pond watershed with a per acre allocation of 0.05 lb/acre/yr would be allowed to increase the annual phosphorus loading to the pond by 5 pounds (0.05 X 100). If the projected increase in phosphorus loading to the pond from the development does not exceed this value, then it can safely be concluded that the development will not add an excessive amount of phosphorus to the pond. This methodology is used by the MDEP to evaluate development applications in lake watersheds under Maine's Site Location Law and Stormwater Management Law. Many towns also use this methodology to evaluate applications for new development under their subdivision and site plan review ordinances. Typically, a developer's consultant, engineer, surveyor, or soil scientist performs this analysis. The MDEP can provide assistance to the Planning Board in reviewing these submittals as well as to the developer in performing the analysis.

Table 8-3. Calculation of Per Acre Phosphorus Allocation for the Etna Pond Watershed

	Value
DDA = Direct land drainage area in Carmel	417 acres
ANAD = Area not available for development in, such as wetlands and steep slopes	80 acres
AAD = Area available for development (DDA - ANAD)	337 acres
GF = Growth Factor; a value of .20 or above is assigned to ponds subject to some development pressure; a value of .15 is assigned to more remote ponds less subject to growth pressure.	0.2
D = Area likely to be developed (GF x AAD) (50 year timeframe)	67 acres
F = lbs. phosphorus allocated to town's share of watershed per parts per billion (ppb) in lake	2.86 ppb
WQC = Water quality category - "good" = greater than average water quality; "moderate-sensitive" = average water quality, but high potential for phosphorus recycling from pond bottom sediments.	Moderate-sensitive
LOP = Level of Protection [h=high(coldwater fishery); m = medium]	M
C = Acceptable increase in lake's phosphorus concentration	1.00 ppb
FC = Allowable increase in annual phosphorus load to the lake	2.86 lbs/year
P = Per acre phosphorus allocation (FC/D)	0.042 lbs/acre/yr
SWT = Small Watershed Threshold (parcel size that triggers alternative phosphorus calculations)	17 acres

Source: Division of Watershed Management, Maine Department of Environmental Protection, 2010

Protection for Etna Pond will require a coordinated effort on the part of all three towns, Etna, Stetson and Carmel. The three towns should agree on an approach to protect the town which could include the methodology presented here, or a simpler approach that has the same goals.

[27] *The "phosphorus allocation" is the maximum amount of phosphorus (per acre) that can be safely added to the lake.*

INVASIVE AQUATIC SPECIES

The introduction of non-indigenous (non-native) invasive plant and animal species to the U. S. has been escalating with widespread destructive consequences. Until now, Maine has been spared the worst introductions, but Maine has four invasive plants of concern - Variable-leaf Milfoil, Hydrilla, Curly-leaved Pondweed, and Eurasian Milfoil. Significant habitat disruption, loss of native plant and animal communities, loss of property values, reduced fishing and water recreation opportunities, and large public and private expenditures have accompanied invasive plant introductions in all of the lower 48 states except Maine. In Maine it is illegal to sell, propagate or introduce to Maine waters eleven invasive aquatic plants. These plants are aggressive growers, and if introduced into freshwaters they become serious nuisances.

Currently, invasive plants have not been identified in Etna Pond. However, variable milfoil infestations have been identified in water bodies in central Maine. Lake associations in some areas have established invasive plant monitoring and education programs. These programs generally involve inspecting boats at boat launches, monitoring plant growth in ponds and eradicating any invasive plants as soon as they are identified.

Regulatory Protection for Water Quality

There are a number of state and federal laws that protect water resources. However, enforcement of these laws by state agencies can be sporadic due to agency staffing levels relative to the vast areas to be monitored. In practice, compliance with most state and federal environmental regulations is left to individual landowners. In many communities there is greater monitoring and enforcement of state and federal regulations through the local code enforcement officer. Some of the most significant state laws affecting water resources, and other natural resources, include:

- **Maine Natural Resource Protection Act (NRPA)** – regulates activities in, on, over or adjacent to natural resources, such as lakes, wetlands, streams, rivers, fragile mountain areas, high and moderate value waterfowl and wading bird habitats, high and moderate value deer wintering areas, significant vernal pools, and sand dune systems. Standards focus on the possible impacts to the resources and to existing uses.
- **Maine Erosion and Sedimentation Control Law** – requires basic controls and stabilization when a project involves filling, displacing, or exposing earthen material. No permit is required, but the law sets minimum across-the-board standards that help prevent harm to surface waters.
- **Maine Storm Water Management Law** – regulates activities creating impervious or disturbed areas (of size and location) because of their potential impacts to water quality. In effect, this law extends storm water standards to smaller-than Site Location of Development Law–sized projects (see below). It requires quantity standards for storm water to be met in some areas, and both quantity and quality standards to be met in others.
- **Maine Site Location of Development Law (Site Law)** – regulates developments that may have a substantial impact on the environment (i.e., large subdivisions and/or structures, 20-acre-plus developments, and metallic mineral mining operations). Standards address a range of environmental impacts.

- **Maine Forest Practices Act** – requires that landowners notify the Maine Bureau of Forestry of any commercial timber harvesting activities, and that commercial harvest activities meet specific standards for timber harvesting adjacent to water bodies, clearcutting and forest regeneration following the timber harvest. If harvesting activities result in a clearcut larger than 5 acres, there must be a separation zone between clearcuts and regeneration standards must be met. This rule requires a harvest management plan developed by a licensed forester for clearcuts greater than 20 acres. The rules prohibit clearcuts greater than 250 acres.

There are also state-mandated locally administered laws that protect water resources. These include the following:

- The **Maine Minimum Lot Size Law** regulates subsurface waste disposal through requirements for minimum lot size and minimum frontage on a water body. The minimum lot size requirement for a single-family residence is 20,000 square feet; the shoreland frontage requirement is 100 feet. The requirements for multi-family and other uses are based on the amount of sewage generated. The local code enforcement officer/plumbing inspector is responsible for administering this law.
- **Shoreland Zoning** provides considerable protection to water bodies and other natural resources located within shoreland areas. Shorelands are environmentally important areas because of their relationship to water quality, value as critical wildlife habitat and travel corridors, and function as floodplains. Development and/or the removal of vegetation in shoreland areas can increase runoff and sedimentation, as well as the amount of nitrogen and phosphorus entering the water that can lead to algae blooms. Steep slopes with highly erodible soils are particularly susceptible to erosion. Shoreland zoning applies to the following: areas within 250 feet of Etna Pond; areas within 250 feet of unforested wetlands 10 acres or larger in size and wetlands associated with great ponds; areas within 75 feet of streams flowing from great ponds, or streams below the confluence of two perennial streams (second order streams).
- Carmel's **Subdivision Regulations** are designed to comply with the state subdivision statute. A subdivision is generally defined as the division of a parcel into 3 or more lots (or units) within any 5-year period, with a few exceptions. State statute requires that subdivisions be designed to address many environmental concerns including water quality, sewage disposal, erosion and sedimentation, aesthetics, groundwater, wetlands, rivers, streams, great ponds and timber harvesting. Carmel's regulations specifically require a 2 acre minimum lot size, or density for clustered development, adequate provisions for septic systems, and a provision that allows the Planning Board to require open space set-asides adjacent to Etna Pond and named streams. The subdivision regulation could be improved to provide more specific guidance to assist the Planning Board in making a determination if a subdivision meets the statutory review criteria pertaining to water resources. For example, this could include guidance on what should be included in an erosions and sedimentation control plan, reference to current MDEP best management practices for stormwater runoff and erosion control, provisions to address liquidation harvesting and phosphorus runoff into Etna Pond.

Carmel's Land Use Ordinance, which regulates most land uses town-wide, provides some protection to water resources through the 2 acre minimum lot size requirement. The Ordinance could be strengthened by adding specific performance standards to protect water quality, such as the following:

- Erosion and Sedimentation Control
- Clearing of Trees and Vegetation
- Industrial Performance Standards
- Oil and Chemical Storage
- Refuse Disposal
- Roads and Water Crossings
- Sand and Gravel Extraction

GRANT PROGRAMS

The following is a list of MDEP grant programs designed to assist towns in protecting water bodies.

- **Small Community Grants Program (SCG)** provides grants to towns to help replace malfunctioning septic systems that are polluting a water body or causing a public nuisance. Grants can be used to fund from 25% to 100% of the design and construction costs, depending upon the income of the owners of the property, and the property's use. An actual pollution problem must be documented in order to qualify for funding. Grant applications must be submitted by the municipality in which the property owner resides. Commercial establishments may qualify if their gross profit for the previous year was $40,000 or less.
- **Nonpoint Source Water Pollution Control Grants ("319" or NPS grants).** The primary objective of NPS projects is to prevent or reduce nonpoint source pollutant loadings entering water resources so that beneficial uses of the water resources are maintained or restored. Maine public organizations, such as state agencies, soil and water conservation districts, regional planning agencies, watershed districts, municipalities, and nonprofit organizations are eligible to receive NPS grants. Activities include: surveys, management plans and implementation of "best management practices" by land owners.

Regional Coordination

Regional coordination is important for the protection and management of shared water resources. The following is a summary of areas where regional coordination could be done in the future:

- Protection of significant sand and gravel aquifer – shared with Levant
- Management and protection of surface water resources
- Etna Pond – Etna and Stetson
- Souadabscook Stream – Etna, Stetson and Hermon
- Harvey Stream – Stetson and Levant
- Black Stream – Levant and Hermon
- Tracy Brook – Newburgh
- Quinn Creek – Etna
- Wiggins Meadow – Stetson

CHAPTER 9. CRITICAL NATURAL RESOURCES

Overview

"Critical natural resources"[28] are those natural resources most vulnerable to the impacts of development. Critical natural resources include sensitive shoreland zones, including floodplains; large habitat blocks; multi-function wetlands; essential wildlife habitats and threatened, endangered, and special concern species; high value waterfowl and wading bird habitat; high value deer wintering areas; significant vernal pool habitat; and significant fisheries habitat.

"Critical rural areas"[29] are those rural areas deserving maximum protection from development to preserve natural resources and related economic activities that may include, but are not limited to, significant farmland and forest land; high value wildlife or fisheries habitat; scenic areas; public water supplies; scarce or especially vulnerable natural resources; and open lands functionally necessary to support a vibrant rural community.

"Critical natural resources" and "critical rural areas" are examined in this chapter and Chapter 8 Water Resources, and Chapter 12 Forestry and Agriculture. Many areas in Carmel have multiple values, where management and protection can serve multiple purposes.

SUMMARY

Are any of the community's critical natural resources threatened by development, overuse, or other activities?

The rural nature of the Carmel, existing rural area zoning, subdivision regulations that include cluster and open space provisions, and shoreland zoning all contribute to protection to critical natural resources. Protection for critical natural resources could be improved by incorporating the Beginning with Habitat information into the land use regulations and the permitting process.

Are local shoreland zone standards consistent with state guidelines and with the standards on adjacent shorelands in neighboring towns?

The State is developing shoreland zoning regulations for the Town of Carmel. Carmel's shoreland zoning will be consistent with shoreland zoning in neighboring towns once it has been updated.

What non-regulatory measures can the community take to protect critical natural resources? Are there opportunities to partner with local or regional advocacy groups?

Carmel could work to educate landowners about critical natural resources using the Beginning with Habitat information and other information in this chapter. The Committee is not aware of any organizations with a focused interest in critical natural resources in Carmel or the surrounding area.

[28] *Maine's Growth Management Act definitions.*

[29] *Maine's Growth Management Act definitions.*

Is there current regional cooperation or planning underway to protect shared critical natural resources?

Souadabscook Stream is an important fishery for anadromus fish species including the alewives, eels and the endangered Atlantic salmon. These species spend the majority of their lives at sea but migrate to freshwater rivers, streams and lakes to spawn. Restoration of these fisheries is part of a larger effort to restore sea-run fisheries to the Penobscot River. The Penobscot River Restoration Project[30] is working to restore eleven species of sea-run fish, including river herring, Atlantic salmon and American shad. The goal is to revive native fisheries and the social, cultural and economic traditions associated with a free-flowing river to the river watershed, while maintaining energy production. The effort has entailed the removal of several dams and installation of fish passage at other dams on the river.

Cooperative efforts to protect shared resources would be beneficial since natural resources often cross town lines (such as, deer wintering areas, Wiggins Meadow). Carmel could encourage such cooperative efforts to educate landowners about critical natural resources using The Beginning with Habitat information.

SUPPORTING DOCUMENTATION

Wetlands

The term "wetlands" is defined under both state and federal laws as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support prevalence of vegetation typically adapted for life in saturated soils". Wetlands include freshwater swamps, bogs, marshes, heaths, swales and meadows. Wetlands can serve many functions: they protect water quality; control flooding and erosion; provide a natural habitat for waterfowl, wildlife and unique plant life; encourage nutrient recycling; and serve as fish sanctuaries and nursery grounds. Wetlands are vital to preserving water quality and the quantity of surface and groundwater resources.

The National Wetlands Inventory (NWI) provides the most accurate identification and mapping of wetlands. Carmel's wetlands have been further assessed based on their value for flood control, sediment retention, habitat importance, and education and research value. **(See Appendix - Wetlands Characterization Map)**

Maine regulates freshwater wetlands under the Natural Resources Protection Act (NRPA). All freshwater wetlands are regulated and the level of review is based on the size of the alteration in the wetland. NRPA was amended in September 2007 to provide protection for significant vernal pools, and high and moderate value waterfowl and wading bird habitats.

Carmel's Shoreland Zoning Ordinance regulates areas within 250 feet of the normal high water mark of non-forested wetlands ten acres or more in size, and wetlands associated with great ponds and some streams.

[30] *The Penobscot River Restoration Project a collaborative effort that includes the hydropower company PPL, the Penobscot Indian Nation, six conservation organizations and the state and federal government.*

While most wetlands receive some level of oversight under state law, the permitting process does not necessarily prohibit the filling and alteration of wetlands, but often just regulates activities to limit degradation of water quality. Small wetlands (less than 10 acres) and forested wetlands, are the least likely to receive adequate protection because of the difficulty in identifying them and gaps in regulation.

Floodplains

Floodplains serve to accommodate high water levels often associated with late winter and spring snow melt and storm water runoff. Flooding can cause serious destruction to structures and property. Activities that increase paved or impervious surfaces, such as buildings and roads, which do not allow water to soak into the ground or that change the watercourse on floodplains, increases the quantity and rate of runoff that can intensify flooding impacts downstream.

The Federal Emergency Management Agency (FEMA) who administers the Federal Flood Insurance Program has mapped 100-year floodplain levels in Carmel. The 100-year floodplain level is where there is a 1% chance in any given year that flooding at this level or above this level will occur. One hundred year floodplains are associated with southerly portions of Black Stream and southerly portions of Souadabscook Stream. Flooding of homes and structures has not been a serious problem in Carmel. However, several roads and culverts have been flooded where the Town has worked to address these problems through road improvements. 100-year floodplains are displayed on the FEMA Floodplain Maps **(See Appendix – Environmental Constraints and Development Constraints Maps)**

FEMA requires that towns adopt an ordinance with minimum standards to participate in the Federal Flood Insurance Program. These floodplain management regulations are designed to discourage development within the floodplain, and include construction standards to minimize flood damage. The Town of Carmel does not have an FEMA approved Floodplain Management Ordinance, which means Carmel residents with homes in the 100-year floodplain are not eligible for government subsidized floodplain insurance.

Overview of Wildlife and Plant Habitats

The rural nature of Carmel provides extensive natural habitat for a variety of plants and animals. Sprawl and development can threaten natural habitats through direct loss of natural areas and through fragmentation of existing large areas of habitat. Fragmentation of habitats by roads, buildings and other development isolates some plants and animals limiting their ability to travel, feed and reproduce. Fragmentation also creates an edge effect where disturbed areas between developed and natural areas are more easily colonized by non-native species. As development and fragmentation continues, more rare species may be pushed to the brink of extinction.

Considerable identification and analysis of wildlife habitats has been done through the Beginning with Habitat Program[31], a habitat-based landscape approach to assessing wildlife and plant conservation needs and opportunities. The goal of the program is to maintain sufficient habitat to support all native

[31] *Beginning with Habitat Program includes Maine Inland Fisheries and Wildlife, Maine Natural Areas Program, Maine Audubon, Maine State Planning Office, U. S. Fish and Wildlife, Maine Cooperative Fish and Wildlife Unit, Southern Maine Regional Planning, Nature Conservancy and Wells National Estuarine Research Preserve; January 2003. Maps are available at the town office.*

plant and animal species currently breeding in Maine by providing information depicting and describing various habitats of statewide and national significance.

Beginning with Habitat suggests maintaining a rich compliment of plant and wildlife habitat by interweaving important wetland and riparian areas, high value habitats and large habitat blocks to identify those areas most critical to protect or conserve. Mechanisms to protect wildlife habitat can include both regulatory and non-regulatory approaches.

The program recommends enhancing shoreland zoning to protect riparian habitats around water bodies. Conservation of undeveloped areas should focus on large blocks of agricultural and forested habitat that include high value plant and animal habitats. Large blocks of undeveloped land usually have more wildlife diversity than smaller areas and are important to certain wildlife species that require large unfragmented habitat (undeveloped and generally road-less areas).

The program is designed to utilize information on three different habitat systems to assist communities in building a system of interconnected conserved lands. These are:

- Wetlands and Riparian Habitats (shoreland habitats)
- High Value Animal Habitats (deer wintering areas, waterfowl and wading bird habitat, Atlantic Salmon spawning and rearing habitat, etc.) and High Value Plant Habitats (Mountain Laurel and Fall Fimbry)
- Large Habitat Blocks (500+ acres)

These habitats are displayed on the Beginning with Habitat Maps. A discussion of each of these follows.

WETLAND AND RIPARIAN (SHORELAND) HABITATS

Wetlands are highly productive areas that provide important habitat for many types of wildlife, including waterfowl and wading birds, frogs, turtles, snakes, fish and shellfish. Development in and adjacent to wetlands degrades their value to wildlife, and can be particularly threatening to wildlife species that move between small wetlands to meet their habitat needs.

Riparian (shoreland) habitats are the transitional zones between open water and wetland habitats, and dry or upland habitats. Riparian habitats include the banks and shores of streams, rivers, and ponds, and the upland edges of wetlands. **(See Appendix – Water Resources and Riparian Habitats)**

The Beginning with Habitat Program recommends conservation of wetlands, and lands around lakes, ponds, rivers and streams since up to 80 percent of terrestrial vertebrate animals use these areas for part of their life cycle. Protection of riparian areas (shorelands) is recommended as the “backbone” of managing wildlife habitat. Shoreland zoning controls land uses and placement of structures within shoreland zones to help minimize impacts to riparian areas and adjacent water bodies.

Shoreland Zoning regulates areas within 250 feet of Etna Pond (great pond) and unforested wetlands 10 acres and larger unless they are associated with a great pond or stream (as defined). Shoreland zoning also regulates areas within 75 feet of larger streams, including Souadabscook Stream and Black Stream. Shoreland zoning does not include areas along small streams (upstream from the confluence of two perennial streams), many forested wetlands, vernal pools and wetlands less than 10 acres in size if they are not associated with a great pond or stream (as defined).

INLAND WATERFOWL AND WADING BIRD HABITAT

Carmel has a variety of wetland habitats used by waterfowl and wading birds. Loons nest annually on Etna Pond where they find ideal nesting and feeding habitat. Etna Pond and the associated wetlands also provide a home to American bitterns, great blue herons, Canada geese, osprey, a variety ducks, and a large number of marsh birds. Waterfowl also breed on upper Harvey Stream, Tracy Brook, and Souadabscook Stream as well as in a number of small beaver flowages within the town.

Ten significant areas of inland waterfowl and wading bird habitat in Carmel are displayed on the **High Value Plant and Animal Habitats Map in the Appendix.**

State shoreland zoning requires that areas within 250 feet of the upland edge of unforested wetlands associated with great ponds (Etna Pond) and that are rated "moderate" or "high" value waterfowl and wading bird habitat be zoned as resource protection.

All of the identified waterfowl and wading bird habitats are also protected as significant wildlife habitat through the Maine Natural Resources Protection Act.

VERNAL POOLS

Vernal pools or "spring pools" are shallow depressions that usually contain water for only part of the year. They are often associated with forested wetlands. Vernal pools serve as essential breeding habitat for certain species of wildlife, including salamanders and frogs (amphibians). Species that must have access to vernal pools in order to survive and reproduce include wood frogs, spotted and blue-spotted salamanders (two types of mole salamanders) and fairy shrimp. Juvenile and adult amphibians associated with vernal pools provide an important food source for small carnivores as well as large game species.

Avoiding impacts to significant vernal pools and their surrounding habitat is important because many amphibian species are pool specific: they must return to the pond in which they were born to breed. The loss of vernal pools and the critical terrestrial habitat around them leads to local loss of amphibian species, a decrease in biodiversity, and a decline in food available for many other animals that live in these areas.

Vernal pools with high value for wildlife are called “significant vernal pools”. Not all vernal pool habitats are considered "significant". In general, a vernal pool habitat is “significant” if it has a high habitat value, either because (1) a state-listed threatened or endangered species, such as a spotted turtle, uses it to complete a critical part of its life history, or (2) there is a notable abundance of specific wildlife, such as blue spotted salamander, wood frog, or fairy shrimp. "Significant vernal pool habitat" includes the vernal pool itself and the area within a 250 foot radius of the spring or fall high water mark of the pool, which is considered critical terrestrial habitat. Significant vernal pool habitat is protected under Maine’s Natural Resources Protection Act (NRPA). An activity in, on or over these areas must avoid unreasonable impacts on the significant vernal pool habitat and obtain approval from the Maine Department of Environmental Protection, through a Permit by Rule or individual NRPA permit approval.

Vernal pools have not been formally mapped in Carmel.

RARE ANIMAL AND PLANT HABITATS

The Maine Department of Inland Fisheries and Wildlife (MDIFW) tracks the status, life history, conservation needs and occurrences for species that are endangered, threatened, or otherwise rare. Endangered and threatened species habitats are designated as "essential wildlife habitats" under the Maine Endangered Species Act, which means that all projects or activities permitted, licensed, funded, or otherwise carried out by the State or towns within a habitat must be reviewed by the MDIFW. Often projects can be modified to protect the habitat.

The following is a discussion of rare animal and plant habitats identified in Carmel. **See the High Value Plant and Animal Habitats Map (Appendix)** for the location of these habitats.

Freshwater Mussel (Creeper) habitat has been documented in Carmel along the Black Stream. The Creeper is a species of "special concern", which means they are rare in Maine based on available information, but are not rare enough to be considered "threatened" or "endangered".

Freshwater mussels are the most endangered group of animals in North America. Maine may have some of the largest remaining populations of some species and will play an important role in species conservation. The decline in mussel populations is due to loss of habitat, decline in water quality and the introduction of the zebra mussel, an exotic species that can out-compete native mussels. Zebra mussels have not been documented in Maine, but are spreading across the U.S.

MDIFW makes the following general recommendations for the management of the habitat:

- Protect areas of primary and secondary habitat which includes areas several miles upstream and downstream from the identified site.
- Consult with MDIFW prior to development or forest harvesting in or near waterways.
- Preserve water quality and stream functions, by maintaining continuous, forested riparian habitats at least 250 feet, preferably 350 feet, from waterways.
- Consider protecting waterways and a 250 foot upland buffer by designating them as resource protection districts to restrict roads, houses, yards and other development.
- When projects are with 250 feet of waterways adhere to forestry best management practices (Maine Forest Service), and erosion and sedimentation control (MDEP).
- Avoid river/stream alteration projects that would alter flow or remove natural features such as riffles and pools.
- Avoid use of broad spectrum pesticides within ¼ mile of waterways.
- Conduct thorough reviews of dam and wastewater discharge proposals. Avoid land uses that would contribute to non-point sources of pollution.
- Assure that illegal fish species are not introduced into water bodies. Such introductions could alter aquatic invertebrate communities and affect host fish populations.

Since all of these species are associated with water bodies, Maine's NRPA and Carmel's Shoreland zoning provide some level of protection, but do not address all of the management recommendations suggested above.

RARE PLANTS

Fall Fimbry is a "threatened plant species" that is imperiled in Maine because of rarity and vulnerability to further decline such that it could become endangered. It is near its most northern limit in Maine and is vulnerable to human activity. Fall fimbry is small sedge that grows in clusters of mats 5-8 cm tall. It grows in sandy wet soils of pond shores where the water level drops over the summer. Fall fimbry has been identified as present along the eastern shore of Etna Pond. The landowner should be made aware that any disturbance of the habitat should be avoided, and the area should be zoned resource protection through shoreland zoning.

Mountain Laurel is listed as a species of "special concern" due to its rarity and vulnerability in Maine. Mountain laurel is a moderate-sized, branched shrub with evergreen leaves that is at the northern limit of its range in Maine. Mountain laurel habitat is usually rocky or gravelly forest and clearings, sometimes swamps. The plant requires moderate to full light to thrive, and populations in open woods have been known to decline as the forest matures and less light reaches the shrubs. Partial harvests, carried out with care for the existing plants can be helpful.

An area of Mountain laurel has been identified on private property behind Clements Way off the Irish Road. The landowner should be encouraged to protect and manage this area to maintain and improve the stand of Mountain laurel. Protection of this area as open space should be required when and if development occurs in this general area.

Table 9-1. Rare Animal and Plant Habitats in Carmel

Common Name	Description	Location	State Status
Creeper	Freshwater Mussel	Black Stream	Special Concern
Fall Fimbry	Plant	Etna Pond (Eastern shore)	Threatened
Mountain-laurel	Plant	Behind Clements Way, off the Irish Road	Special Concern

Notes:
"Endangered species" are rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.
"Threatened species" are rare and, with further decline, could become Endangered, or federally listed as Threatened.
"Special Concern species" are rare in Maine, based on available information, but not sufficiently rare to be considered "Threatened" or "Endangered".
Source: Maine Natural Areas Program, Maine Inland Fisheries and Wildlife

DEER WINTERING AREAS (DWA)

Carmel's topography and forest tree types support a healthy population of deer. Ten deer wintering areas (DWA) have been identified in Carmel by the MDIFW**. (See Appendix - High Value Plant and Animal Habitats Map)**

White-tailed deer in Maine are at the northern limits of their geographic range, and in northern Maine their numbers appear to be on the decline. During winter, deer are exposed to cold temperatures and deep snow that makes it hard to find food and keep warm. Deer adapt to winter by congregating in DWA where the snow is not as deep and there is protection from the wind and ample food. A DWA is defined as "a forested area used by deer when snow depth in the open/hardwoods exceeds 12 inches, deer-sinking depth in the open/hardwoods exceeds 8 inches, and mean daily temperatures are below 32 degrees". DWA are crucial to winter survival of deer. Use of DWA is usually ongoing from one year to the next, and specific sites may receive annual use by many generations of deer.

A DWA is ideally composed of over 50% conifers, with a conifer canopy of over 50%, with most trees over 35 feet in height. Approximately half of a DWA should be in mature conifers at any one time, while the remainder is made up of several age classes of regenerating forest that are interspersed throughout the DWA. Proper management of the DWA involves timber harvesting. It is common to use an even-aged management, 75-year rotation with a 15-year cutting interval. This will produce five age classes that will ensure perpetual softwood cover and a mix of available browse.

Over-harvesting of the forested cover as part of a logging operation or for building is the primary threat to DWAs. Regulatory protection of DWAs is minimal because the state has not adopted this mapping for regulation by the Natural Resources Protection Act. MDIFW encourages landowners to develop a management plan for their DWAs to provide optimal winter and summer habitat for deer.

There is currently little to no protection for the DWAs identified in Carmel. The Town may want to work with the landowners to protect and manage this habitat. The Town could also require that DWAs be maintained in open space to the extent practicable when development is proposed in these areas.

LARGE UNDEVELOPED HABITAT BLOCKS

Large undeveloped habitat blocks are relatively unbroken areas of habitat that can include forests, grassland, agricultural land, and wetlands. "Unbroken" means that the habitat is crossed by few roads, and has relatively little development and human habitation. These blocks are especially important to species that require large blocks of habitat (moose, black bear, fisher, oven bird, scarlet tanager, etc.), but they are also likely to serve a wider diversity of species than smaller blocks. The Beginning with Habitat Program recommends that towns work together to preserve large habitat blocks. Only in such blocks will many species find the home ranges that they need to breed, travel and protect themselves.32 Conservation of large habitat blocks can also provide other benefits, such as preservation of farm and forestland, open space, recreational land, aquifer protection and scenic areas.

[32] *See Beginning with Habitat notebook for additional information.*

There are four undeveloped habitat blocks greater than 500 acres in size in Carmel as displayed on the Undeveloped Habitat Blocks Map. Two of these areas are shared with Stetson, one is shared with Newburg, and one is mostly in Carmel with a very small portion in Hermon. These blocks of habitat also include undeveloped water bodies and wetlands. Some protection of these areas occurs as a result of the rural nature of Carmel. Incentives or requirements for open space subdivisions and limitations on the length of internal roads would enhance protection for large habitat blocks.

U.S. Fish and Wildlife (USFWS) Priority Trust Species

The USFWS has identified and mapped high value habitats for Priority Trust Species. These areas have been identified as high value habitats for 64 species of fish and wildlife occurring in the Gulf of Maine. The 64 species were chosen because they meet one or more of the following criteria:

- Federally endangered, threatened and candidate species,
- Migratory birds, anadromous[33] and estuarine fish that are significantly declining nationwide, or
- Migratory birds, anadromous and estuarine fish that have been identified as threatened or endangered by 2 or more of the 3 states in the Gulf of Maine watershed (watershed includes Maine, part of New Hampshire, and part of Massachusetts).

These "high value habitats" are shown in 3 basic habitat types: forested, grassland, and wetland on the USFWS Priority Trust Species Habitats Map. To reduce the complexity of the mapping, only the best quality (top 25%) of each habitat type is shown and areas less than 5 acres are not shown.

(See Appendix – USFWS Priority Trust Species Map)

Fisheries

Carmel has several important fisheries, including Souadabscook Stream and Etna Pond. These fisheries play an important role in the overall ecology of the community and serve as a recreational resource with quality of life and economic benefits. Sport fishing is a popular recreational endeavor that contributes income to the local economies of many communities.

Souadabscook Stream is an important fishery for anadromus fish species including the alewives, eels and the endangered Atlantic salmon. These species spend the majority of their lives at sea but migrate to freshwater rivers, streams and lakes to spawn. Restoration of these fisheries is part of a larger effort to restore sea-run fisheries to the Penobscot River. The Penobscot River Restoration Project[34] is working to restore eleven species of sea-run fish, including river herring, Atlantic salmon and American shad. The goal is to revive native fisheries and the social, cultural and economic traditions associated with a free-flowing river to the river watershed, while maintaining energy production. The effort has entailed the removal of several dams and installation of fish passage at other dams on the river.

33 Anadromous fish species spend the majority of their lives at sea but return to freshwater rivers, streams, and/or lakes to spawn. There are ten species native to Maine: alewife, striped bass, Atlantic salmon, rainbow smelt, blueback herring, American shad, sea lamprey, Atlantic sturgeon, shortnose sturgeon, and brook trout.

34 The Penobscot River Restoration Project a collaborative effort that includes the hydropower company PPL, the Penobscot Indian Nation, six conservation organizations and the state and federal government.

ATLANTIC SALMON HABITAT

In 1999, Atlantic salmon were listed as an endangered species in eight Maine Rivers by the U.S. Fish and Wildlife Service. The Maine Atlantic Salmon Commission within the Maine Department of Marine Resources is responsible for management and recovery of the Atlantic salmon.

The prognosis for salmon recovery is uncertain, and scientists are continuing to study reasons for the decline. Factors contributing to the decline in salmon populations include: dams that impede migration, predation by birds, introduced fish, and anglers, and decline in water quality due runoff containing sediment and chemicals from adjacent land. Acid rain and global warming may also be impacting the population.

Portions of Souadabscook Stream serve as critical spawning and rearing habitat for the endangered Gulf of Maine Atlantic Salmon. Atlantic salmon spend the majority of their lives at sea but return to fresh water rivers and streams, and/or lakes to spawn. Atlantic salmon were historically found in all major river systems and many of their tributaries with suitable spawning habitat in Maine and New England. Today, in Maine they are found in several rivers, including the Penobscot River and some of its tributaries.

Spawning habitat is characterized by coarse gravel or rubble bottom with suitable well-oxygenated, clean water with appropriate velocity and depth. The eggs are buried in gravel nests and hatch in March and April. The young salmon spend 2-3 years in this habitat before migrating to the North Atlantic near Greenland and Labrador. They spend about 1-3 years at sea before returning to spawn in the same area that they were spawned.

There are a number of actions that Carmel can take to protect the habitat including:

- Protect the waterway and adjacent land (250 feet from the high water mark) through shoreland zoning – resource protection is best to limit nearly all development, or at least low density residential.
- Consult with MDIFW and Maine Atlantic Salmon Commission prior to development or forest harvesting to determine what management tools would best protect the habitat.
- Utilize Maine Forest Service and Maine Department of Environmental Protection best management practices for forestry and land use activities within 250 feet of the waterway.
- Work with landowners through voluntary agreements, conservation easements, etc. to protect shorelands.
- Avoid road or pipeline crossings, use of heavy equipment or stream alterations in the waterway.
- Avoid use of broad spectrum pesticides within ¼ mile of the stream habitat.
- Educate anglers to promptly return the Atlantic Salmon unharmed if caught accidentally.
- Discourage the introduction of non-native fish species, which is illegal.

ETNA POND FISHERIES

Fish species found in Etna Pond include American eel, Chain pickerel, largemouth bass, smallmouth bass, white perch, yellow perch, brown bullhead and a number of other common fish species, according to MDIFW. MDIFW also stocks Etna Pond with brook trout.

It is important to note that Etna Pond is the headwaters for Souadabscook Stream, which means maintaining the water quality in Etna Pond, and the entire watershed, for that matter, is important to maintaining Atlantic salmon habitat in Souadabscook Stream.

PROTECTION FOR FISHERIES

Land use activities, particularly those that remove trees and vegetation from shoreland areas of brooks, streams and ponds, can result in increased water temperatures and degradation of water quality. Maintenance of vegetative buffers to provide shade, particularly for cold-water species (trout and salmon), and to protect water quality is important to maintaining healthy fisheries. Destabilization of banks and activities that increase erosion and sedimentation diminish water quality. Maine's Natural Resources Protection Act and local land use regulation, including shoreland zoning provide considerable protection for fisheries, because of requirements for vegetative buffers and restrictions on activities that remove vegetation.

Road construction and maintenance activities can also have a significant impact on fisheries. On streams, rivers, and brooks the biggest threat to aquatic habitats is fish passage, particularly for those species that require upstream habitats for spawning and other habitat needs. Improperly designed culverts can prevent fish passage. MDIFW recommends that culverts less than 4 feet in diameter be imbedded into 6 inches of stream bottom, and larger culverts be imbedded in at least 1 foot of stream bottom material. Maintenance and continuance of the natural stream bottom surface material without major changes in elevation is important to maintaining fish passage. Ditching and drainage designs should direct runoff into vegetated areas or sediment ponds to allow for the filtering out of sediments before runoff is released into water bodies.

Protection for Critical Wildlife Habitat

REGULATORY PROTECTION

State Laws, such as the Maine Endangered Species Act and the Natural Resource Protection Act provide considerable protection to "significant wildlife habitat", which include high and moderate value waterfowl and wading bird habitat, high value vernal pools, high and moderate value deer wintering areas (if, mapped and rated) and habitat associated with rare and endangered species. These laws do not provide protection to all of the wildlife resources described in this Chapter, such as the unrated deer wintering areas or undeveloped habitat blocks.

Other state laws that include regulatory protection for critical wildlife habitat include the Maine Site Location of Development Act and the Maine Forest Practices Act.

The State mandated shoreland zoning and subdivision statutes also require some protection for wildlife habitat. The Shoreland Zoning Act includes in its statement of purpose to prevent and control water pollution; to protect fish spawning grounds, aquatic life, bird and other wildlife habitat; to protect freshwater wetlands; to conserve shore cover, and visual as well as actual points of access to inland waters; and to conserve natural beauty and open space (38 MRSA Sec 435). However, these provisions are only applicable to those areas governed by shoreland zoning. Shoreland zoning can be a very significant tool to not only protect water quality, but to also preserve wildlife corridors, particularly when

areas are zoned as resource protection. The State Subdivision Act's review criteria include consideration for aesthetic, cultural and natural values – a subdivision shall have no undue adverse effect on scenic or natural beauty, aesthetics historic sites, significant wildlife habitat, rare or irreplaceable natural areas, or any public rights for physical or visual access to the shoreline. (30-A MRSA. Sec 4404). Again, these provisions are only applicable to subdivision development (i.e., division of parcel into 3 or more lots within a five year period).

Carmel's Land Use Ordinance contains two provisions that can be used to protect habitat. These provisions allow for clustered housing and open space set-asides. The rural area zoning requires a minimum 2 acre lot size and limits the types of uses.

At a minimum, Carmel's land use regulations should be amended to include consideration of the Beginning with Habitat information presented in the chapter. The information could be used to guide and manage development in areas with high habitat values.

NON-REGULATORY

There are a number of non-regulatory approaches that Carmel could use to protect critical wildlife habitats, including education and use of voluntary land owner agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect habitat.

Scenic Resources[35]

A town's visual image, which consists of its collection of scenic resources, has important quality of life and economic values. Carmel possesses many scenic resources. The Town's rolling topography, numerous streams, and rural landscape make for many scenic views and vistas. Perhaps, the most important scenic views and vistas are those visible to the general public from public roads, water bodies, public recreation areas or other publicly accessible locations.

INVENTORY OF SCENIC RESOURCES

Scenic resources can include forested corridors, views of the lake and streams, farmland, views from hilltops, scenic gateways to the town or village, and cultural landmarks – scenic farmstead, scenic view of village or historically significant building(s). The following is a preliminary inventory of scenic resources visible from public places, such as public parks or public roads identified by the Comprehensive Plan Committee:

- Scenic farmland along the Horseback Road
- Route 2/Iris Road area
- Views of Dixmont Mountain
- Dyer Road subdivision – scenic easement
- Ruggle's Cemetery near Plymouth
- Route 2/Perry Lane area – view of fields
- Etna Lane – view of forest land
- Spratt Road off Dyer Road – views of mountains

This preliminary list of scenic resources can be expanded to include the identification of those scenic resources that are most important to the community. The most important scenic resources are those

[35] Scenic areas are considered "critical rural areas" under Maine's Land Use Regulation Act.

that have the most significant impact on the overall character of the town, particularly those that are highly visible and highly valued by the people of Carmel.

The following criteria can be used to prioritize scenic resources:

- Accessibility – must be visible to the general public from a public way, public recreation area or other publicly accessible location.
- Uniqueness – unique or rare features are particularly important.
- Distance of View or Viewshed – relates to size of view, view of only a few feet is less important than a view of several miles.

PRESERVING AND ENHANCING SCENIC RESOURCES

Regulatory Approaches: There is some consideration for scenic resources in the state mandated subdivision and shoreland zoning laws. Proposed subdivisions cannot have an "undue adverse impact on scenic or natural beauty of the area". Development in shoreland zones must "conserve shore cover, and visual as well as actual points of access to inland waters" and "conserve natural beauty and open space". These provisions provide general guidance on what is to be considered in reviewing proposed projects, but do not identify or more specifically describe, the scenic areas or views to be protected. Scenic resources would receive greater protection if they were identified and described.

The Town could complete an inventory of its high value scenic resources to include photographs, descriptions, and locations on a map. Inventory information can be used in permitting, where developments can be located to preserve high value resources to the greatest extent practicable. For example, developers could site ridgeline development so that it is not visible from a distance, or utilize vegetative screening and setbacks along road corridors.

Non-regulatory Approaches: Initiatives to preserve and enhance scenic resources include:

- A village shade tree program with funding and technical assistance through the Maine Bureau of Forestry Project Canopy Program and grants.
- Improvements, such as landscaping and signage, at gateways to the community with assistance from the Maine Department of Transportation's Gateway Program and grants.
- For scenic resources on private land education and voluntary agreements to preserve high value scenic resources.
- For scenic resources on public land, maintain and improve natural vegetation and landscaping, and provide attractive signage, where appropriate.

Regional Coordination

Regional coordination is particularly important to the protection of critical natural resources because wildlife and fisheries habitats often extend across town boundaries.

Souadabscook Stream Atlantic Salmon spawning and rearing habitat: Successful restoration of critical Atlantic Salmon habitat in Maine is dependent on cooperative efforts at all levels of government. Town officials will want to monitor these efforts and respond accordingly.

Water bodies:

- Etna Pond – Etna and Stetson
- Harvey Stream – Stetson and Levant
- Tracy Brook – Newburgh
- Wiggins Meadow - Stetson
- Quinn Creek – Etna
- Black Stream – Levant and Hermon
- Souadabscook Stream – Etna, Stetson and Hermon

Deer Wintering Areas: Stetson and Etna; **Waterfowl and Wading Bird Habitat:** Etna and Newburgh

Large Habitat Blocks: Levant, Stetson, and Newburgh

CHAPTER 10. HISTORIC AND ARCHAEOLOGICAL RESOURCES

Overview

Historical and archaeological resources contribute significantly to the character of the Town. The people of Carmel treasure their past, which is evident in the ongoing activities of the Carmel Historical Society. This chapter includes a brief history of the Town, an inventory of archaeological and historical sites, and discussion about what is being done to preserve these important resources.

SUMMARY

Are historic patterns of settlement still evident in the community?

Many historic patterns of settlement are still evident in Carmel, including the village and Route 2 as a major thoroughfare.

What protective measures currently exist for historic and archaeological resources and are they effective?

State mandated shoreland zoning, and subdivision regulations contain language that allows consideration of historic, archaeological, and/or cultural resources. These ordinances could be strengthened with the language that has been suggested by the Maine Historic Preservation Commission, which primarily focuses on historic and archaeological resources that are either on the National Register for Historic Places, or are eligible to be listed on the register.

Do local site plan and/or subdivision regulations require applicants proposing development in areas that may contain historic or archaeological resources to conduct a survey for such resources?

Regulations could be strengthened by being more specific and requiring surveys and measures to reduce impacts, where appropriate. The language could also suggest that the Maine Historic Preservation Commission be consulted, when appropriate.

Have significant historic resources fallen into disrepair, and are there ways the community can provide incentives to preserve their value as an historical resource?

The Town is not aware of any significant historic or archaeological resources that have fallen into disrepair.

Is there an active historical society, and does the community adequately support its efforts?

Carmel's Historical Society is active in preserving Carmel's history. Activities have includes historic presentations, video records of older citizens, an annual historic calendar and work on a town history.

SUPPORTING DOCUMENTATION

A Brief History of Carmel[36]

Carmel was first settled in 1798. It was an attractive area for settlement as it offered abundant water and generally level land, with large tracts of alluvial land along streams and a dense growth of pine.

The Town was incorporated on June 21, 1811. From its beginnings, Carmel has been a close knit family town, with religion, associations, and fraternal organizations playing a major role in the community. Since 1925, the Town has had a library; early records show that the library hosted and participated in such events as plays, talent shows, and card parties. The Carmel Church also played a prominent role in the social life of Carmel. It was located in the village area and was the only church around. This church, dedicated on March 17, 1825, was for all evangelical denominations. Originally five denominations used the church, although by the turn of the century, it was primarily Methodist. In 1943, the church was reorganized as a Congregational Church.

The Town of Carmel has always had a selectman form of government. In March of 1950, the Town voted to adopt the selectman-town manager form of government and the first town manager (Leonard L. Bishop, Jr.) was hired some time thereafter.

Carmel, through its history, has been first a logging community, then a farming community, and now a bedroom community. Early landowners logged their property. After it was cleared, they sold tracts to homesteaders from southern New England states. Carmel then became principally a farming community. The years from 1840-1880 were a prosperous period. Dairies, sawmills, and livery stables were located in Town. By horse and cart, Carmel was one day's travel west of Bangor (six miles from boundary to boundary) on a major route. The village area had as many as three hotels at one time. The population grew from 520 people in 1840 to 1,350 in 1870, a population level not reached again for one-hundred years.

As the turn of the century approached, Carmel, like many small communities, was changed by the combination of industrialization, war, and the appearance of the automobile. Carmel became a struggling bedroom community when people gave up farming and sought employment in industries in urban areas. National events such as World War I and the Depression further contributed to this trend. Between 1880 and 1900, the population declined in size from 1,220 people to 962. Although the population increased slightly between 1900 and 1910, it then declined again until 1940.

Since 1940, the population of Carmel has grown, from 870 to 2,645 in 2008. Carmel is now a thriving bedroom community with Bangor and its surrounding metropolitan area an easy commute by automobile.

Carmel Historical Society

The Carmel Historical Society has been actively working to preserve the history of the Town for a number of years. The Society holds monthly meetings at its Paul Haskell Museum, at 12 Plymouth Road,

[36] *Source: Comprehensive Plan, 1990*

next to the Simpson Memorial Library, Carmel Village. Preservation of this historic structure is an ongoing project for the Society. The Historical Society also has a number of other projects including:

- Historic presentations
- Video recording of conversations with older citizens
- Work on a History of Carmel
- Annual historical calendar

Historic and Archaeological Sites[37]

Historic sites provide unique insights into a community's past and help answer broad questions about the area's history. Historic buildings represent an economic opportunity; maintaining and rehabilitating older buildings can mean savings in energy, time, money, and raw materials. The preservation of a community's character is also closely tied to the preservation of its historic structures.

Archaeological sites also provide valuable scientific information about the past. In Maine, archaeological sites are typically prehistoric (Indian) or Euro-American. As these sites were often along inland rivers and road corridors, areas now being developed, significant sites are particularly vulnerable to destruction if they are not identified and preserved.

Historic surveys in Carmel might identify 19th century industrial (mill) sites and farms as well as potential National Register-eligible properties. In 1867, seventeen mills were located in Carmel. These included board mills, shingle mills, a lemon-box mill, a cloth dressing and carding mill, and a grist mill on Carmel's various streams. Another possible historic site is the Irish Colony, which was located southwest of the intersection of Fuller and Irish Roads. This community engaged in farming as well as speculative sub-surface mining for mica and possibly even gold from the late 1800's to the 1940's.

A local historic resources survey would define the historic character of the Town and identify significant historic sites. The information obtained could be used to construct a preservation plan for wise use of the community's historic resources. A preservation plan can establish priorities for dealing with historic resources and present specific ways to maintain and enhance the positive character of the Town.

In Carmel, potential archaeological sites would most likely be located along the shore of Etna Pond and the shorelines of streams, particularly navigable streams which could have been used as early means of transportation. Areas which would have provided good camping and boat access along lakes, rivers, and streams have the highest potential for archaeological sites. Because water levels have fluctuated over time, the possibility of sites along "fossil shorelines" should also be considered. These may be located by looking for the swampy areas adjacent to lakes and streams.

In the future, the possibility of more in-depth historic or archaeological studies should be considered to identify specific structures or sites that should be targeted for preservation. A school project, in cooperation with the University of Maine, might be one way to investigate some of the more promising archaeological sites.

[37] *Source: Comprehensive Plan, 1990*

MHPC Inventory of Historic and Archaeological Resources

The Maine Historic Preservation Commission (MHPC) is the agency responsible for overseeing historic and archaeological resources within the Maine. The Commission has identified three types of historic and archaeological resources that should be considered in comprehensive planning:

- Prehistoric Archaeological (Native American resources, before European arrival)
- Historic Archaeological (mostly European-American after written historic records, about 1600 A.D.)
- Historic Buildings/Structures/Objects (buildings and other above ground structures and objects)

Archaeological resources are those found underground and are locations where there has been prior existence of human beings including structures, artifacts, terrain features, graphics or remains of plants and animals associated with human habitation. Prehistoric archaeological resources are those associated with Native Americans and generally date prior to 1600s. They include camp or village locations, rock quarries and workshops, and petroglyphs or rock carvings. Historic archaeological resources are those associated with the earliest European settlers, and sites may include cellar holes from houses, foundations for farm buildings, mills, wharves and boat yards, as well as shipwrecks.

PREHISTORIC ARCHAEOLOGICAL SITES

MHPC has mapped "archaeologically sensitive areas" for prehistoric sites. Prehistoric archaeological site sensitivity maps are based on the current understanding of Native American settlement patterns. Most commonly, prehistoric archaeological sites are located within 50 meters of canoe-navigable water, on relatively well-drained, level landforms. Some of the most ancient sites (>10,000 years old) are located on sandy soils within 200 meters of small (non canoe-navigable) streams. Where professional archaeological survey is not complete, archaeological sensitivity maps are based on water shoreline, surficial geology, and landform.

Archaeologically sensitive areas in Carmel include areas around Etna Pond, Souadabscook Stream, and Harvey Stream including Wiggins Meadow, and a small portion of Tracy Brook where in flows into Souadabascook Stream. **(See Appendix - Known Archaeological Sites Map)** MHPC states that a professional archaeological survey is needed along the shoreline and valley sides of the Harvey Brook and Souadabscook Stream drainages, and around a small pond located in glacial outwash soils in the northeast corner of the town.

HISTORIC ARCHAEOLOGICAL SITES

MHPC has identified two historic archaeological sites in Carmel (Table 12-1). One is the Ruggles Place, the farmstead archaeological site around the standing structure (house) which is the oldest standing house in the Town according to MHPC records, circa 1801. The other is the archaeological site of the Ruggles and Robinson mills, built originally 1799, and listed as mill ruins and foundations.

Table 12-1. Historic Archaeological Sites			
ID Number	Name	Type	Timeframe
ME 079-001	Ruggles Place	American farmstead	1801 to present
ME 079-002	Ruggles & Robinson Mills	American mill, sawmill	1799 to c. 1870
Source: Maine Historic Preservation Commission, April 2009			

These sites are located in the green box on the Archaeological Sites Map.

Historic archaeological sites can be predicted most often by a review of historic records, maps and deeds. Settlement often focused on transportation corridors, first rivers, and then roads as they were built. Archaeological sites from the first wave of European settlement in any town are likely to be significant (National Register eligible).

No town-wide professional archaeological survey for historic archaeological sites has been conducted in Carmel. MHPC recommends that a professional archaeological survey be conducted with a focus on agricultural, residential and industrial sites relating to the earliest Euro-American settlement of the Town in the early 19th century.

HISTORIC BUILDINGS/STRUCTURES/OBJECTS

MHPC has not identified any above ground historic resources in Carmel that are or should be listed on the National Register of Historic Places. MHPC suggests that a survey be conducted to identify properties that might be eligible for nomination to the National Register of Historic Places.

Protection for Historic and Archaeological Resources

The nationally recognized standard for what makes an historic or archaeological resource worthy of preservation is normally eligibility for, or listing on, the National Register of Historic Places. The National Register, administered by the National Park Service, U.S. Department of Interior, is a listing of those buildings, districts, structures, objects and sites deemed worthy of preservation for their historical, cultural or archaeological significance. Because the National Register is intended to accommodate buildings and sites of national, state and local significance, it can include historic or archaeological resources of value to towns. Structures on the National Register also receive a limited amount of protection from alterations or demolition where federal funding is utilized. There isn't anything within Carmel that has been identified or listed on the National Register of Historic Places.

The primary threat to most of these types of buildings and sites is the desire of their owners, present and future, to alter them in ways that destroy their architectural or archaeological integrity. Activities that disturb the ground can potentially destroy significant archaeological information.

For archaeological resources, MHPC recommends that towns establish a mechanism for review of all construction or other ground disturbing activity within prehistoric archaeologically sensitive and historic archaeologically sensitive areas, or including known archaeological sites. This mechanism might include contacting MHPC for an opinion, and/or review of the construction area by a MHPC-approved archaeologist.

Maine's Subdivision statute (30-A MRSA 4401-4407) recommends review of impact on "historic sites" (Section 4404(8)), which includes both National Register listed and eligible buildings and archaeological

sites. Maine's Shoreland Zoning statute (38 MRSA 435-449) includes, as one of its purposes, "protect archaeological and historic resources" (Section 435). Subdivision or other construction review ordinances could be strengthened by including language indicating applicability and development plan requirements similar to the following:

“An appropriate archaeological survey shall be conducted when archaeological sites within or adjacent to the proposed subdivision which are either listed in or eligible to be listed in the National Register of Historic Places, or within or adjacent to an area designated as archaeologically sensitive or potentially containing such sites, as determined by the municipality or the Maine Historic Preservation Commission.”

“If one or more National Register eligible or listed archaeological sites will suffer adverse impact, appropriate mitigation measures shall be proposed in the subdivision plan, and submitted for comment to the Maine Historic Preservation Commission at least 20 days prior to action being scheduled by the Planning Board.”

Historical and archaeological resources can also be protected to some extent through public education. The activities of the Carmel Historical Society serve to increase public awareness and appreciation for the Town’s cultural resources.

CHAPTER 11. LAND USE

Overview

An analysis of land use is one of the most important elements of the comprehensive plan because it provides the basis for future planning for the town. This chapter predicts where and how much future growth is most likely to occur over the next decade based on an analysis of examining land use patterns and development trends. The Town's land use regulations and their administration and enforcement are also examined. Key policy issues to be addressed include: to what extent does the Town wish to direct future development; how can the Town best prepare for future development; how does the Town ensure that new development will be compatible with existing uses; and how can the Town assure that new development will not over-tax public facilities and services.

SUMMARY

How is most recent development occurring: lot by lot; in subdivisions; or in planned developments? How is recent development consistent with the community's vision?

Most new residences have been located in rural areas of town as opposed to the village over the past decade. About 50% of new residences have been new homes built on subdivision lots or mobile homes placed in mobile home parks. The other 50% of new homes and mobile homes have been placed on individual lots not located in developments. The most activity has been along the Fuller Road followed by the Hampden Road and Horseback Roads. Generally, there has been more development north of I-95 and in the eastern half of the town.

New lots have principally been created along existing road frontage as opposed to being served by newly constructed roads. Subdivision lots have been located with frontage along public roads, eliminating the need for expensive internal roads. Backland remains generally undeveloped forests and fields.

New and expanded commercial development over the past decade has consisted of a few new small business and a few expansions. Most of these have been located along the Route 2 corridor.

Development trends are consistent with the community's vision for itself.

What regulatory and other non-regulatory measures would help promote development of a character, and in locations that are consistent with the community's vision?

The Town's Land Use Ordinance Residential-Farming District is designed to maintain the rural residential character of the community as its highest priority. Ordinance standards limit activities that have the potential of negatively impacting these residential areas.

The Commercial District is less restrictive, and designed to support small to medium–size business activity in areas primarily along Route 2. Intensive industrial uses are not encouraged through the ordinance's provisions.

Protection of critical natural resources is achieved through state laws, including the state-mandated, locally administered shoreland zoning and subdivision statutes. The Town's ordinances could be improved by adding performance standards to provide addition protection to critical natural resources.

There were about 4,500 acres enrolled in the Tree Growth and Farmland Property Tax Programs in 2008, which provide some level of protection to commercial forest and farmlands.

One of the most significant changes the town could take is to establish a separate Village Area district that provides an opportunity to focus on achieving its vision for the village, which includes consideration for the most desireable uses, improvemtns to public landscaping, and improvments funded through grants, such as a centralized public water supply.

How do current regulations promote or inhibit development in keeping with the Town's traditional village or neighborhood character?

Carmel's land use regulations are designed to promote its small town rural character, and an increasingly suburban character. Most new residential development is not occurring in or near the village – one reason is that the soils do not support smaller lots with on-site septic systems. The 2 acre minimum lot size and 200 foot minimum road frontage requirements in the Land Use Ordinance in combination with development occurring along public roads are not conducive to neighborhood development, even in rural areas. However, the Town recently enacted a provision to encourage backlot development that may encourage a more desirable development pattern. The Ordinance has provisions to allow clustered housing, but there have not been any clustered developments proposed.

Given current regulations, development trends, and population projections, how many new residential units and how much commercial, institutional and/or industrial development will occur in the planning period? Where will this development go?

Carmel will continue to grow as a bedroom community over the next decade. Population projections predict the population will grow slowly with an increase of almost 120 people between 2010 and 2020, which would mean about 50 to 60 new homes. Unless changes in the town's ordinances create incentives to do otherwise, future development is likely to continue to occur along existing roads where soils are suitable for development. This is particularly true for the smaller subdivisions where the construction of new roads is not economically feasible. Consideration should be given to encouraging more compact development patterns, rather than the scattered approach now occurring.

If development trends continue as they have, little commercial or industrial growth can be expected. For now, smaller commercial uses and home industries are the most likely non-residential uses to locate in Carmel. In particular, additional commercial and service businesses may be attracted to town if residential uses continue to increase. Major increases in gasoline

prices might also support the development of convenience stores and businesses to start-up in town.

What is the Town's administrative capacity to manage its land use regulation program, including planning board and code enforcement officer?

Administrative capacity is adequate at this time; however, any increase in regulation, such as implementation of Maine's Uniform Building and Energy Code, may require increasing Code Enforcement Office/Plumbing Inspector (CEO/LPI) hours.

Are environmentally suitable areas within or adjacent to the growth area(s) identified for the location of mobile home parks?

Mobile home parks are allowed in the Residential-Farming District, where there are many environmentally suitable areas.

SUPPORTING DOCUMENTATION

The Setting

Carmel is located in central Maine, approximately fifteen miles west of Banger (from the center of Bangor to the center of Carmel) and fifty miles inland from the coast. The total land area of Carmel is 37.0 square miles, of which there are 36.5 square miles of land, and 0.5 square miles (1.24%) of water.[38] The vast majority of Carmel consists of forest, fields, and vacant land as displayed on the Aerial Map.

Carmel is primarily a bedroom community to the greater Bangor metropolitan area. Carmel's growth and development patterns reflect its geographic location within the region and its generally rolling topography and fairly good soils.

Carmel first became a struggling bedroom community around the turn of the 20th century when people gave up logging and farming, and sought employment in industries in Bangor and urban areas elsewhere. As a result the population plummeted, and didn't rebound until the arrival of the automobile which allowed people to live in Carmel and commute to Bangor for work. At that point Carmel began to grow and thrive as a bedroom community.

Today, the predominant built use in town is residential homes. The remaining land uses in Carmel consist of small commercial businesses, public and semi-public uses, several gravel pits, and some commercial forestry and agriculture. The greatest concentration of development is in the village area at the intersection of Routes 2 and 69. There are also concentrations of residential and commercial uses along the Route 2 corridor, and to a slightly lesser extent along Route 69, and several other town roads.

Existing land uses are displayed on two maps in the **Appendix – Aerial Photography Map and the Land Cover Map.**

[38] *U.S. Census*

The Village

Carmel's village is not only centrally located, but is also the center of community activity. There are approximately fifty homes located in the village area. Nearly all of the town's public and semi-public uses are located in the village, including the municipal building, fire station, post office, school administrative building, elementary school, library, recreation area, the American Legion Post, Grange and several churches. Businesses in the village include several restaurants, a fence and guard-rail company, a general store and a convenience store. Carmel's village is an important place – it serves as a focus for the town's identity and is where people meet and interact as a community. Community celebrations, such as Carmel Days and the Christmas Tree Lighting and Caroling Sing-a-long, are held in the village on an annual basis.

Residential Uses

The majority of housing in Carmel is single family homes. According to the 2000 Census, 69% of housing units were single family homes, 27% of housing units were mobile homes and about 4% of units were multifamily units. About 94% of the town's housing was occupied year-round, 2% was seasonally occupied, and the remaining 2% was vacant at the time of the 2000 Census.

Currently, multifamily housing in Carmel consists of one 4-unit condo and two 4-unit apartment houses. There are two mobile home parks – South Slope Estates Mobile Home Park (35 units) on Hampden Road and Grandeur Mobile Home Estates (40 units) on Dottie's Way.

Residential Building Permit Data

Building permit data is an indicator of the type and number of structures being built in town. Not all permits result in construction, however. A total of 305 building permits were issued between 2000 and 2009, of which 184 were for stick-built homes (including modular homes) and 121 were for mobile homes. This means that 40% of these permits were for mobile homes.

The number of permits issued per year increased from 17 permits in 2000 to a high of 50 permits for 2005. Since 2005 the number of building permits issued per year has dropped to 24 units per year. In 2009, the number of permits for mobile homes was 18, three times the number of permits for stick-built homes. These trends may reflect the downturn in the economy, with people looking for more affordable housing options, such as mobile homes.

Table 11-1. Building Permits

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Units/Year
Homes	9	12	19	24	29	34	21	15	15	6	184	18.4
Mobile Homes	8	9	13	22	13	16	4	9	9	18	121	12.1
Total	17	21	32	46	42	50	25	24	24	24	305	30.5

Source: Carmel Town Reports, Code Enforcement Officer

RESIDENTIAL LOT DEVELOPMENT

Most new residences have been located in rural areas of town as opposed to the village over the past decade. About 50% of new residences have been new homes built on subdivision lots or mobile homes placed in mobile home parks. The other 50% of new homes and mobile homes have been placed on individual lots not located in developments. The most activity has been along the Fuller Road, with slightly less activity along the Hampden and Horseback Roads. Generally, there has been more development north of I-95 and in the eastern half of the town.

New lots have principally been created along existing road frontage as opposed to being served by newly constructed roads. Subdivision lots have been located with frontage along public roads, eliminating the need for expensive internal roads. Backland remains generally undeveloped forests and fields. The Town amended the Land Use/Zoning Ordinance in 2006 to allow the development of backlots to encourage a more desirable development pattern.

SUBDIVISION ACTIVITY

Ten small subdivisions were approved between 2003 and 2010. These subdivisions ranged in size from 3 lots to 16 lots, and the average parcel sizes were generally not much more than the minimum 2 acres. They were all located in rural areas of the town.

Table 11-2. Subdivision Activity: 2003-2010

Year	Subdivision Name/Developer	Location	Approx. # Lots
2003	Tim Newcomb's	Dyer Rd.	4
	Carmel Meadows North	Fuller Rd.	9
	Carmel Meadows South	Fuller Rd.	6
2004	Chris Patten	Bemis Rd.	4
	Nute-Rowe	Dyer/Plymouth Rds.	5
2005	None	-	-
2006	Haskell-white	Irish Rd.	3
2007	Gene Clavette	Horseback Rd.	6 (Phase 1)
	Vernard Adams	Cook/Swett Rd.	16
	Ted McCloud	Bemis Rd.	3
2008	None	-	-
2010	None		

Source: Carmel Town Reports, Code Enforcement Officer

Commercial Uses

The majority of commercial uses are located in the village and along Route 2. Carmel has a range of small to medium-sized commercial uses including retail and wholesale establishments, and business and personal services. There are also a number of home occupations. An inventory of commercial uses is included in Chapter 2 Economy.

Permits for new and expanded commercial uses indicate that there has been a very modest amount of new or expanded commercial activity since 2003, which is not surprising given current economic conditions. Most of this activity has occurred along Route 2. Since 2003 special use permits have included day care busineses, a dog care business, a junkyard, a gift shop, and a few other similar types of commercial endeavours.

Public and Semipublic Uses

There are a number of public and semi-public uses in Carmel. Most of these, such as the municipal building, recreation area, post office, library, American Legion Post, Grange, two churches, cemetery and one of the schools are located in the village. Public and semi-public facilities located in rural Carmel include the State sand and salt facility (Route 69), the Caravel Middle School (Irish Road), and one church (Route 2). Of these uses, the church is the only one that was constructed within the past ten years.

Development Patterns and Trends

Summary of Past Trends

Development in Carmel over the past several decades reflects the town's primary role as a bedroom community to the greater Bangor metropolitan area. Residential growth, in the form of single family homes and mobile homes has been steady. Most of this growth has occurred in rural areas along public roads. The village remains a center for public and civic activity, but little additional growth has occurred in and around the village. Commercial uses are small and provide goods and services close to home. New uses established since 2003, such as day care, dog care, provide convenience for residents.

Predictions for Future Growth

Carmel will continue to grow as a bedroom community over the next decade. Population projections predict the population will grow by almost 120 people between 2010 and 2020, which would mean about 50 to 60 new homes.

Unless changes in the town's ordinances create incentives to do otherwise, future development is likely to continue to occur along existing roads where soils are suitable for development. This is particularly true for the smaller subdivisions where the construction of new roads is not economically feasible. Consideration should be given to encouraging more compact development patterns, rather than the scattered approach now occurring. As road frontage develops access to backland may become more of an issue.

If development trends continue as they have, little commercial or industrial growth can be expected. For now, smaller commercial uses and home industries are the most likely non-residential uses to locate in Carmel. In particular, additional commercial and service businesses may be attracted to town if residential uses continue to increase. Major increases in gasoline prices might also support the development of convenience stores and businesses to start-up in town.

Amount of Land Needed for Future Growth

Estimating the amount of land needed for future development is based on the trends of the past ten years, and future population projections. Assuming that there will be a demand for at least 50 to 60 new homes over the next ten years, and using the current minimum lot size of 2

acres, this calculates to a need for at least 100 to 120 acres of land for new residential uses by the year 2020. Since some residential lots are larger than two acres, and to allow for consideration of even more residential development for planning purposes, the town should probably plan for up to at least 500 acres of new residential development by the year 2020. The amount of land needed will depend on a number of factors that are impossible to foresee at this time, including the future economic climate, population growth and the housing costs.

GUIDING FUTURE GROWTH

Planning for future growth involves identification of areas suitable, or conversely, not suitable for development. The type and intensity of development must also be considered. Generally, areas with development constraints, such as steep slopes, poor soils, wetlands, shallow depth to bedrock, or flood hazard areas, are not suitable for development. Other areas generally considered not suitable for development include unique and sensitive natural areas, such as aquifer recharge areas for water supplies, significant waterfowl and wading bird habitat, and deer wintering areas. Development may also not be desired in areas highly valued for forestry and agriculture.

DEVELOPMENT CONSTRAINTS

Wetlands, hydric soils, floodplains, shallow soils, highly erodible soils, and steep slopes can present serious constraints to development. These constraints to development are displayed on the **Environmental Constraints Map and Soil Potential for Low Density Development Map** prepared by the U.S. Department of Agriculture Resource Conservation Service, Bangor Office. These maps are in the Appendix.

Slopes and soil characteristics influence the economic and physical feasibility of land development, both in terms of the actual placement of buildings and roads, and in the functioning of septic systems and other site alterations. Flat, gently sloping and moderately sloping areas are usually well suited for development, but flat areas can be difficult to drain, and are often wetlands, floodplains or otherwise marginal soils.

Slopes greater than 15% are of concern for development suitability. Development becomes increasingly problematic as the slope gradient increases. Roads on steep slopes are more costly to construct and maintain, and can be more dangerous to travel on, particularly for emergency vehicles and school buses during winter. Steep slopes can make buildings and subsurface disposal systems more expensive to construct and maintain. The Maine Subsurface Wastewater Disposal Law prohibits new subsurface waste disposal systems on slopes greater than 20%. Additionally, steep areas are more susceptible to erosion problems and water quality degradation. All construction on slopes greater than 25% should be avoided due to the extremely high cost of construction and likelihood of environmental damage. Fortunately, there are not a lot of steep slopes in Carmel.

Soil characteristics, such as depth to bedrock, erosion potential, soil wetness and flooding potential can present constraints to development. Often these areas can be modified for devel-

opment through filling, excavating and blasting; however, this work requires additional expense and can increase future maintenance costs.

By far, the most limiting factor for residential and commercial development in Carmel is the suitability of soils for septic sewage disposal. About 46% of Carmel's land area is considered to have a moderate or high potential suitability for septic sewage disposal. **(See Appendix - Soil Potential for Low Density Development Map)**

Soil factors which influence suitability for septic sewage disposal include slope, texture of subsoil and substratum, drainage or general wetness, water level, depth to bedrock, flooding, stoniness and rock outcrops, and stability of substratum. Adequate septic sewage disposal depends on the soil's capacity to absorb and filter effluent. Any soil condition that hinders the filtering process contributes to system failures and health hazards, such as contaminated drinking water, exposed effluent, and foul odors.

Development review and approval should carefully consider the limitations of the soil and its suitability for the proposed use. On-site inspections of individual proposals and strict enforcement of the State Subsurface Waste Water Disposal Law and Plumbing Code are vital to ensure that inappropriate development does not occur.

Floodplains, which are not extensive in Carmel, are discussed in detail in the chapter on Natural Resources.

OTHER CONSTRAINTS TO DEVELOPMENT

The town may also choose to consider valuable natural resources, such as high yield groundwater aquifers, sensitive or unique wildlife habitats, and important forests and farmland as areas where development should be discouraged. These are discussed in detail in other chapters of this Plan.

Land Use Regulation in Carmel

OVERVIEW

Carmel's land use ordinances consist of the Land Use/Zoning Ordinance adopted in 1962 and Subdivision Regulations adopted in 1977. The state imposed shoreland zoning ordinance also regulates development in Carmel's shoreland areas. Both shoreland zoning and subdivision regulation are state mandated and must be administered according to state statute[39].

Carmel also administers the state mandated Minimum Lot Size Law, Maine Subsurface Wastewater Disposal Law and the Maine Plumbing Code. A floodplain management ordinance is required if the town wants to participate in the federal flood insurance program. Carmel does not have a floodplain ordinance, which means its citizens do not have access to federally subsidized floodplain insurance. Carmel's Land Use/Zoning Ordinance is a local option, but state law

[39] *Mandatory Shoreland Zoning Act (38 MRSA Sec435 et seq.), Subdivisions (30-A MRSA Sec4401 et seq.)*

requires that it be consistent with a comprehensive plan prepared in accordance with the Growth Management Act[40].

A relatively new state law larger towns (4,000+ population) are required to administer is the Maine Uniform Building and Energy Code (PL 699). The Uniform Building and Energy Code was enacted in 2008 to establish a statewide, uniform building, energy and rehabilitation code that requires local administration. To administer this code a town needs to have a state-trained building inspector/code officer.

CARMEL'S LAND USE/ZONING ORDINANCE

The ordinance's purpose is "to promote the health, safety, convenience and welfare of the inhabitants by dividing the Town into zones and regulating the use and construction of buildings and premises with a view to encourage the most appropriate use of land in the Town, in accordance with the provisions of Chapter 90-A of the Revised Statutes of Maine, 1954, as amended".

The town-wide Land Use/Zoning Ordinance divides the town into two districts - Residential-Farming and Commercial[41]. The Commercial District generally consists of a band 500 feet wide along both sides of Route 2 from west to east across the center of the town. There is also a Commercial District at the intersection of Fuller Road and Horseback Road. Single-family and multi-family residences and commercial businesses are permitted in this district.

The remainder of town is zoned Residential-Farming. This district permits a fairly wide range of uses including single-family homes, mobile homes, churches, schools, and agricultural uses "provided (they are) not injurious, noxious, or offensive to the neighborhood." Mobile home parks are also permitted in this district.

The minimum lot size in both zones is 2 acres. Two-family homes must have 2½ acres and an additional ½ acre is required for each additional living unit. In addition to minimum lot sizes, the ordinance includes standards for setbacks, living space, roadways, signs, trailer parks/mobile home courts and nonconforming uses.

The Land Use/Zoning Ordinance is administered by the Code Enforcement Officer and the Planning Board. The CEO issues building permits for residential uses, along with plumbing and on-site waste disposal permits, while the Planning Board issues Special Use Permits for commercial uses and mobile home courts/trailer parks.

The following table summarizes the land use/zoning ordinance provisions.

[40] Growth Management Act (30-A MRSA Sec 4312 et seq.)

[41] An Industrial zone was rezoned as Commercial August 11, 1997.

Table 11-4. Summary of Land Use/Zoning Ordinance		
Zone	Allowed /Permitted Uses	
Residential-Farming	Family dwelling, including single trailer or mobile home Mobile home courts, trailer parks Private club (non-profit, with less than 5 sleeping rooms Church, Educational use General purpose farm, agriculture, garden, nursery, selling only produce or plants the major portion of which is raised in the town and excluding any use injurious, noxious or offensive to the neighborhood Accessory use (home occupations)	**Prohibited Uses:** Uses injurious, noxious or offensive to the neighborhood **Special Use Permits:** Uses not listed as allowed/permitted, such as other commercial uses
Commercial	Any use permitted in Residential-Farming District, except those prohibited (see next column) Apartment house, lodging house, hotel, motel, overnight cabins Filling stations, parking space for storage of autos or garage Club, place of amusement or assembly Office, bank, restaurant, store, bakery Storage of pulpwood or logs for shipment Signs, associated with occupants goods or services Any other business, service or public utility not involving manufacture on the premises; except manufacture of products where the major portion of which is to be sold at retail by the manufacturer to the consumer is permitted.	-

Table 11-5. Summary of Dimensional Standards				
Use	Minimum Lot Size	Minimum Living Space	Min. Road Frontage[42]	Building Setbacks
All uses, except as specified below	2 acres	-	200 feet	68 feet from centerline of public or private way 20 feet from any adjacent lot
Single family dwelling, mobile home	2 acres	500 sq. ft., with at least 500 sq. ft. of ground floor space (per unit)	200 feet	
Two-family dwell-	2.5 acres		250 feet	
More than two-family dwelling	2.5 acres plus .5 acres / add. unit		250 ft. plus 20 ft. for each additional	
Subdivisions with lot sizes greater than 5 acres or	-	-	400 feet (per lot)	

[42] *Frontage is defined as "frontage along an accepted public way or an approved private way" (approved private way not defined). Ordinance states this amendment does not apply to lots in existence prior to the amendment. (Date of amendment should be in the ordinance.)*

The following are a few recommended changes to the land use ordinance:

- Update Ordinance to comply with current state laws, such as mobile home park regulations
- Update Ordinance to include some newer uses and to contain more specific standards and definitions to ensure that permitted uses are appropriately regulated.
- Provide a more detailed definition for "uses injurious, noxious or offensive to the neighborhood" to give the Planning Board more guidance
- Consider allowing all lots that have frontage on Route 2 to have the whole lot designated as Commercial.

CARMEL'S SUBDIVISION REGULATIONS

The subdivision ordinance sets forth the procedures and submission requirements for proposed subdivisions. The ordinance also contains some requirements regarding open space, lot size, street design and construction, buffer strips, and drainage. The standards contained in the ordinance tend to be very general and it would be to the town's advantage to incorporate more specific standards that are less open to interpretation. Also, recent changes to the subdivision law should be incorporated into the ordinance.

Administrative Capacity

The Town of Carmel has a part-time code enforcement office/building and plumbing inspector who is responsible for administering Carmel's land use regulations. This includes providing staff support to the Planning Board. This person works 16 hours per week and is otherwise on-call, and available by phone.

Administrative capacity is adequate at this time. However, any increase in regulation, such as implementation of Maine's Uniform Building and Energy Code, would significantly increase permitting activity, and may require additional staff time.

Carmel has a WEB page that allows people to obtain a substantial amount of permitting, property tax, and other information themselves.

CHAPTER 12. FORESTRY AND AGRICULTURE

Overview

Historically, forestry and agriculture were the foundation of Carmel's local economy. Today, Carmel is a bedroom community with a few small-scale commercial forestry and agriculture operations. Forests, farmlands, and open space are important, however, because they define the community's rural character and scenic landscape. These lands provide open space for recreation and habitat for wildlife. Forests also protect soil and water quality, and are increasingly viewed as important for carbon sequestration.

The primary threat to forestland and farmland is conversion of the most important of these lands for development. Over harvesting of forestland and soil erosion due to poor land management practices can threaten water quality, and can degrade the rural landscape that citizens cherish.

This chapter examines Carmel's forestry and agriculture.

SUMMARY

How important is agriculture and/or forestry and are these activities growing, stable, or declining?

Carmel is a bedroom community with very little commercial agriculture or forestry. Most commercial operations are small-scale, part-time operations. It is important to note that as land is converted to house lots or divided into smaller lots, there will be less of a land base for commercially viable forestry or agriculture.

Is the community currently taking regulatory and/or non-regulatory steps to protect productive farming and forestry lands? Are there local or regional land trusts actively working to protect farms or forest lands in the community?

Carmel's Residential-Farming District is designed to allow forestry and agriculture. The Maine Farmland Trust, Small Woodlot Owners of Maine, and Maine Organic Gardeners and Farmers are state-wide organizations that actively work to protect forestland and farmland.

Are farm and forest land owners taking advantage of the state's current use tax laws?

In 2008 the acreage enrolled in Tree growth increased to 3,790 acres. The number of parcels enrolled nearly doubled from 31 in 1988 to 61 in 2008. The average parcel size decreased from 85 acres in 1988 to 62 acres in 2008. There were 8 parcels enrolled in the Farmland Property Tax Program in 2008. There were a total of 696 acres enrolled, with 200 acres in cropland and 496 acres enrolled as woodlands.

Has proximity of new homes or other incompatible uses affected the normal farming and logging operations?

This has not been a problem in Carmel.

Are there large tracts of agricultural or industrial forest land that have been or may be sold for development in the foreseeable future? If so, what impact would this have on the community? Is liquidation harvesting[43] an issue in the community?

This has not been an issue in Carmel.

Supporting Documentation

Forestland

Carmel has a lot of forested land, as is displayed on the 2006 Arial Photo Map. Some of these woodlands are a result of unused agricultural land reverting to forest.

Forestland owners in Carmel are small woodlot owners, as opposed to the large industrial or investment fund owners. Smaller landowners may use their forestland for a variety of purposes including home sites, timber harvesting for personal use or sale to others, for privacy or buffering from adjacent uses, for wildlife habitat, for scenic value, or for recreation. Recreation may take the form of hunting, hiking, snowmobiling, or other non-specific outdoor activity.

Landowners can have a variety of reasons for harvesting timber including a desire to generate income, improve the forest, produce firewood, or expand open areas for homebuilding, pastureland or lawn, or to improve aesthetics.

There are two indicators of the amount of commercial forestry taking place in the town. These include the amount of land classified under the State's Tree Growth Property Tax Law, and timber harvest data from the Maine Forest Service.

Land Enrolled in Tree Growth

Table 12-1. Forestland Enrolled in the Tree Growth Program

Year	Total (acres)	Softwood (acres)	Mixed-wood (acres)	Hardwood (acres)	Number of Parcels
1988	2,634	1,060	1,039	535	31
2008	3,790	791	2,371	628	61

Source: 1995 Comprehensive Plan (1988 data); Maine Revenue Services, Municipal Valuation Return, 2008

The Maine Tree Growth Program allows for the assessment of property taxes on forestland to be based on current use rather than market value as long as the land is managed according to the criteria set forth in the law. The law specifies that there must be at least 10 acres of forestland used for commercial harvesting, and that a Forest Management and Harvest Plan be prepared. If the forestland no longer meets the criteria of eligibility, or the landowner opts to withdraw from Tree Growth classification, then a penalty is applied to recover some of the back property taxes.

[43] *Liquidation harvesting means the purchase of timberland followed by a harvest that removes most or all commercial value in standing timber, without regard for long-term forest management principles, and the subsequent sale or attempted resale of the harvested land within 5 years (MRSA Title 12 Section 8868, subsection 6).*

In 1988, 9.9% of Carmel's land area, or 2,634 acres, were classified under the State Tree Growth Tax Law. In 2008 the acreage enrolled in Tree growth increased to 3,790 acres. The number of parcels enrolled nearly doubled from 31 in 1988 to 61 in 2008. The average parcel size decreased from 85 acres in 1988 to 62 acres in 2008.

Forestry will likely continue as it has over the past decade. As land is converted to house lots or divided into smaller lots, there will be less of a land base for commercially viable forestry.

TIMBER HARVESTS

There were 328 active timber harvest notifications between 1991 and 2007 according to data from the Maine Forest Service (Table 11-2). Landowners are required to notify the Forest Service before timber is cut or removed when the primary purpose of the harvest is to sell or use the timber for forest products. This amounted to about 20.5 harvest notifications per year and about 500 acres harvested per year. Of the total acreage harvested between 1991 and 2007, 90% was selection harvests, 8% was shelterwood harvests, and less than 2% was clearcut harvests (defined in table). About 246 acres of harvested acreage was for a change of land use, or clearing for homes or other structures, for example.

Table 12-2. Summary of Timber Harvest Information for the Town of Carmel

Year	Selection harvest, acres	Shelterwood harvest, acres	Clearcut harvest, acres	Total harvest, acres	Change of land use, acres	Number of active notifications
1991	348	170	87	605	14	13
1992	587	110	17	714	4	17
1993	350	0	11	361	0	8
1994	110	0	10	120	10	6
1995	335	0	0	335	0	14
1996	399	0	0	399	0	10
1997	579	50	7	636	0	13
1998	667	5	6	678	6	22
1999	596	0	0	596	0	30
2000	647	18	0	665	0	36
2001	493	85	0	578	10	29
2002	374	0	0	374	4	23
2003	312	50	0	362	1	19
2004	210	0	0	210	174	17
2005	314	37	0	351	0	18
2006	396	46	5	447	10	28
2007	486	70	13	569	13	25
Total	7,203	641	156	8,000	246	328

Key to Headings:
"Selection harvests" remove some trees of all sizes, either singly or in small groups with the goal of encouraging regeneration with a multi-aged stand structure.
"Shelterwood harvests" remove trees from a forest stand in 2 or more stages; the initial harvest removes most mature trees, leaving enough trees to serve as seed sources and to provide the right amount of shade to produce a new generation of trees.
"Clearcut harvests" remove most or all the trees in one harvest; regeneration occurs through natural seeding by nearby trees, from stumps, planting seedlings, or from seedlings already growing in the understory.
"Change of Use" is usually removal and sale of trees prior to land clearing for a home or other development.
Sources: Maine Forest Service; data from Confidential Year End Landowner Reports; data is reported only where three or more landowner reports reported harvesting in the town.

COMMUNITY FORESTRY PROJECTS

The Town of Carmel does not have a town forest, village shade tree program, or any other community activity focused on forestry.

Agriculture

There is very little commercial agriculture in Carmel today. Small-scale agricultural operations include hay production, raising a few beef cattle, and several equestrian facilities. Residents also raise chickens, maintain gardens, raise a few livestock, or other similar farming-type activities for personal use.

LAND ENROLLED IN THE FARMLAND PROPERTY TAX PROGRAM

The Maine Farmland Property Tax Program is similar to the Tree Growth Program in that property taxes are assessed based on current use rather than market value if the land remains in agricultural use. In the Farmland Program the property owner is required to have at least 5 contiguous acres. The land must be used for farming, agriculture, or horticulture, and can include woodland and wasteland. The farmland must contribute at least $2,000 gross income from farming activities each year. If the property no longer qualifies as farmland, then a penalty is assessed.

There were 8 parcels enrolled in the Farmland Property Tax Program in 2008. There were a total of 696 acres enrolled, with 200 acres in cropland and 496 acres enrolled as woodlands. In 2005, there were 6 parcels enrolled in cropland consisting of 90 acres.[44]

PRIME FARMLAND AND FARMLAND OF STATEWIDE IMPORTANCE

"Prime farmland" has been identified by the U.S. Department of Agriculture as land that is best suited to producing food, feed, forage, fiber and oilseed crops. It has soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime Farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

"Farmland of Statewide Importance" is land, in addition to prime, that is of statewide significance for the production of food, feed, fiber, forage, and oilseed crops. These lands are generally considered nearly prime farmland and that economically produce a high yield as prime farmlands if conditions are favorable.

(See Appendix - Prime Farmland and Farmland of Statewide Importance Map)

COMMUNITY AGRICULTURE PROJECTS

The Town of Carmel has not undertaken any actions to formally support community agriculture, such as a community garden or farmer's market.

Protection for Important Forest and Farm Land

There is some protection and/or support for forest and farm land provided through federal, state and local programs as listed below.

The Maine Forest Practices Act – requires that landowners notify the Maine Bureau of Forestry of any commercial timber harvesting activities, and that commercial harvest activities meet specific standards for timber harvesting adjacent to water bodies, clearcutting and forest regeneration following the timber harvest. If harvesting activities result in a clearcut larger than 5 acres, there must be a separation zone between clearcuts and regeneration standards must be

[44] *Maine Revenue Services, Municipal Valuation Returns, 2005 and 2008.*

met. This rule requires a harvest management plan developed by a licensed forester for clear-cuts greater than 20 acres. The rules prohibit clearcuts greater than 250 acres.

Tree Growth Tax Law - (36 MRSA, Section 571, et seq.) and the Farm and Open Space Tax Law - (36 MRSA, Section 1101, et seq.) both encourage landowners to conserve these lands by taxing the land at a rate based on use, rather than fair market value. There are penalties for removing land from these classifications for development, which provides a disincentive for conversion of the land.

The U.S. Natural Resources Conservation Service and County Conservation District can provide both technical and financial assistance directly to landowners to help conserve farm and forest land.

ORGANIZATIONS

There are a number of public and non-profit organizations that promote agricultural and/or forestry activities such as the Maine Forest Service and the Maine Department of Agriculture, the University of Maine Cooperative Extension, the Maine Organic Farmers and Gardeners Association, the Maine Farmland Trust, and the Small Woodlot Owners of Maine.

Carmel's Land Use Ordinance

Carmel's Land Use Ordinance contains the following language pertaining to allowed agricultural uses throughout the town: "General purpose farm, agriculture, garden, or nursery, selling only produce or plants the major portion of which is raised in the Town of Carmel and excluding any use injurious, noxious, or offensive to the neighborhood" (Article IV.1.e.). To date, this wording has not limited agricultural operations.

It also appears that some commercial forestry operations might be limited to the Commercial Zone which is along Route 2. The ordinance lists "storage of pulpwood or logs for shipment" as an allowed use in the Commercial Zone.

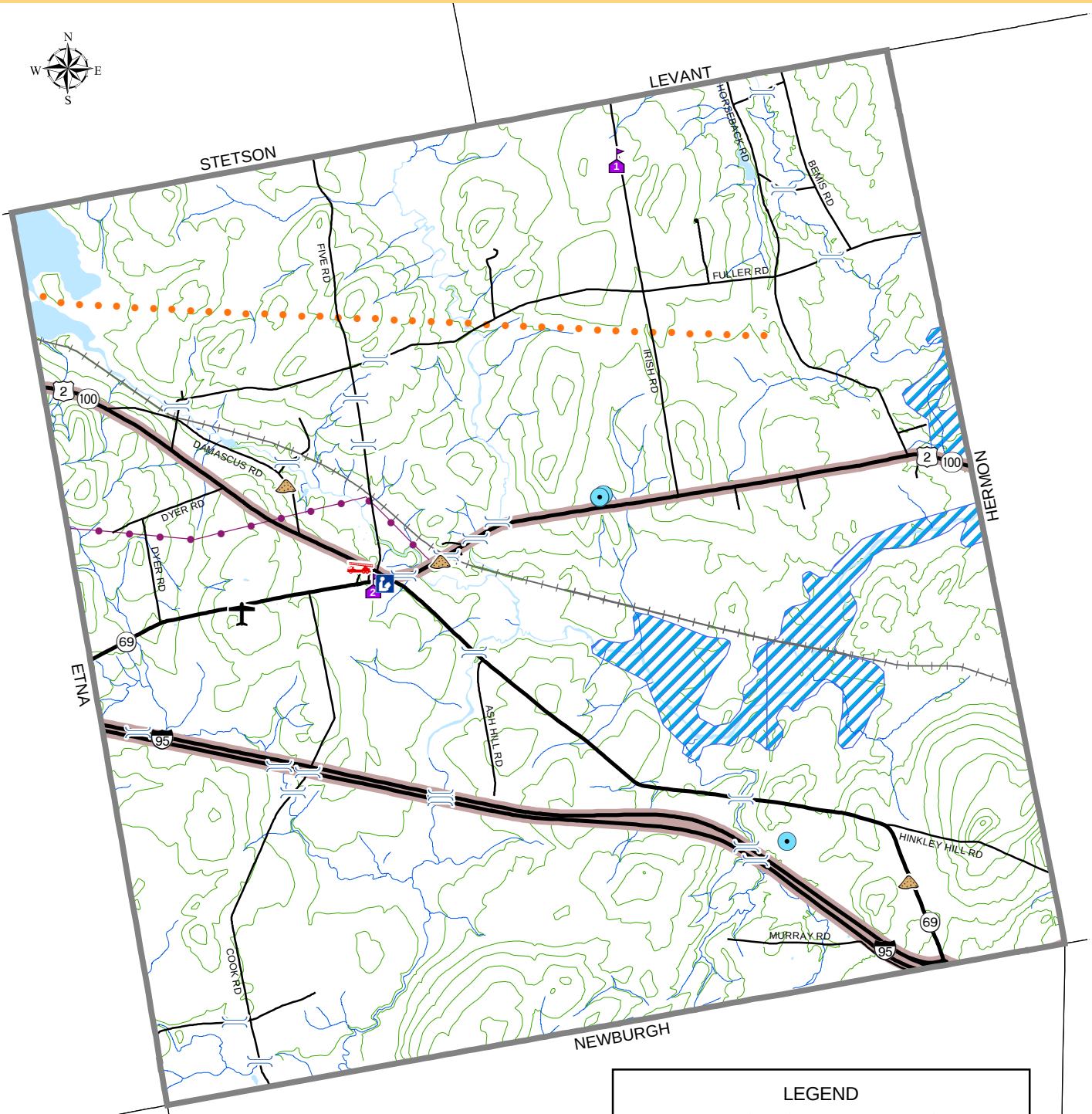
The Town might want to review the Ordinance and make amendments to clarify its intent with regard to agricultural and forestry uses.

APPENDIX: MAPS

1. Hazard Mitigation
2.Recreation and Infrastructure
3.Transportation
4. Significant Aquifers and Wetland Characterization
5. Watersheds - Classification of Rivers and Streams
6. Water Resources and Riparian Habitats
7. High Value Plant and Animal Species
8. Wetland Characterization
9. USFWS Priority Trust Species
10. Known Archaeological Sites and Archaeologically Sensitive Sites
11. Prime Farmland and Farmland of Statewide Importance
12. Aerial Photography
13. Land Cover
14. Soil Potential for Low Density Development
15. Environmental Constraints
16. Natural Resources (Soils and Slopes)
17. Development Constraints (Floodplains)

Penobscot County Hazard Mitigation Plan

Town of Carmel



Sources: FEMA/NFIP, USGS, MEDHS, MEDWP, MDOT and MEGIS

Map created: April, 2005

LEGEND

INFRASTRUCTURE AND UTILITIES

- State roads
- Town roads
- Railroads
- Ring Hill Airport
- Heavy Haul Truck Network
- Telephone Line
- Electric Lines
- Bridge

NATURAL RESOURCES

- 40 Foot Contours
- Streams
- Water
- Flood Zone Area

PUBLIC FACILITIES AND SERVICES

- Community Public Water Supply
- Carmel Fire Department
- Carmel Public Library
- School
- Sand/Salt Shed

1 - Caravel Middle School
2 - Carmel Elementary School

The Flood Insurance Rate Map (FIRM) for Carmel was published in 2/28/1975.

Recreation and Infrastructure
Town of Carmel

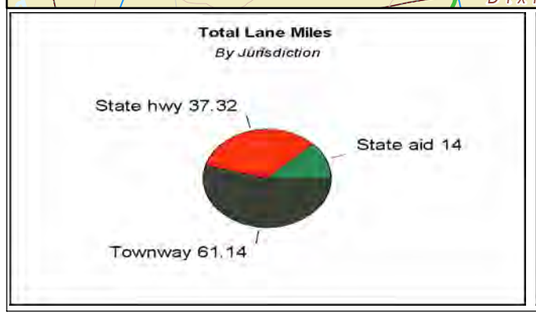
Boat Launch
Hospital
Schools
Libraries
Rescue Station
Fire Station
Police Station
Conserved Lands
E-911 Roads

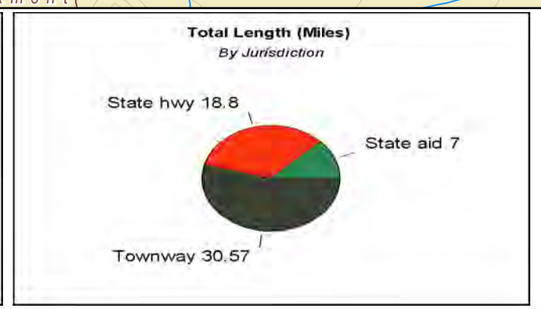
Spring 2009

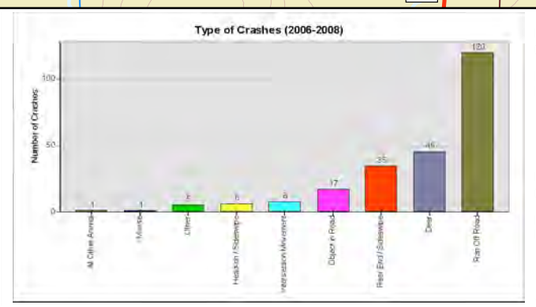
0 4,000 8,000 12,000 Feet

1:48,000 1 inch = 4,000 feet

Carmel







Leading Link Crash Locations in Carmel
(2006-2008)

ELEMENTID 221528 17 Crashes
ELEMENTID 214798 15 Crashes

Leading Node Crash Locations in Carmel
(2006-2008)

NODEID 39099 3 Crashes
NODEID 41270 3 Crashes

**Link and/or Node Crash Locations in the community are labeled in the Map*

Top Crash Locations (2006-2008) *(Source: MDOT)*

- Top Node Crash Locations (2006-2008)
- Top Element Crash Locations (2006-2008)

Road Jurisdiction *(Source: MDOT)*

- Interstate
- Other Freeways & Expressways
- State Highway
- State Aid
- Townway
- Townway Summer Maintenance Only
- Townway Winter Maintenance Only
- Seasonal Parkway
- Reservation
- Other Local Roads *(Source: Maine Public Utilities Commission (MEPUC))*

Other Transportation

- Railroad *(Source: MDOT)*
- Railroad Crossings *(Source: MDOT)*
- Bridge *(Source: MDOT)*
- Park & Ride Lots *(Source: MDOT)*
- Rest Areas *(Source: MDOT)*

Airports

Airports *(Facility Use, OwnerType)* *(Source: MDOT)*

- Public, Public
- Public, Private

Boundaries *(Source: Maine Office of Geographic Information Systems (MEGIS))*

- Town
- County
- State
- Metropolitan Planning Organization Areas *(Source: MDOT)*
- State Urban *(Source: MDOT)*
- Fire Station *(Source: Maine Office of Geographic Information Systems (MEGIS))*
- Hospital *(Source: Maine Office of Geographic Information Systems (MEGIS))*
- Police *(Source: Maine Office of Geographic Information Systems (MEGIS))*

***Other Map Information**

- ▶ Hydrography Names
  (Source: Maine Office of Geographic Information Systems (MEGIS) & Maine Department of Environmental Protection (MDEP))
- ▶ Landform Feature Names based on the USGS Geographic Names Information System
  (Source: Maine Office of Geographic Information Systems (MEGIS))
- ▶ Contour Interval= 60'
  (Source: Maine Office of Geographic Information Systems (MEGIS))
- ▶ Street Names
  (Source: Maine Public Utilities Commission (MEPUC) & Maine Department of Transportation (MDOT))

Scale: 1:60,000

0 0.25 0.5 0.75 Miles

MaineDOT

State of Maine
Department of Transportation
Bureau of Transportation Systems Planning

May 06, 2009

Stetson

Levant

Hermon

Carmel

Etna

Newburgh

Hampden

Dixmont

Significant Aquifers and Wetland Characterization Town of Carmel

Spring 2009

Aquifer Type

- 10 - 50 Gallons per Minute
- Greater than 50 Gallons per Minute

Wetland Characterizations

- Less than 3 Wetland Functions
- More than 3 Wetland Functions

N W E S

0 4,000 8,000 12,000 Feet

1:48,000 1 inch = 4,000 feet

Town of Carmel

- Political Boundaries
- Lakes & Ponds
- Watershed Boundaries
- Wetland Flow Path
- Wastewater Outfalls
- Overboard Discharges

Transportation Routes

- Private & Parkways
- State & Local Roads
- Toll Highway

N

Classifications

Rivers & Streams

- AA
- A
- B
- C

Estuarine & Marine

- SA
- SB
- SC

0 0.5 1 2 Miles

Map compiled by Maine Department of Environmental Protection, Division of Watershed Management, 2009

Levant
Hermon
Carmel
Etna
Plymouth
Dixmont
Newburgh
Hampden
Harvey Stream
Black Stream
Etna Pond
Tracy Brook
Souadabscook Stream
State Quarry Brook
Tracy Pond
Hermon Pond
Ben Annis Pond
Hammond Pond
Patten Pond

Beginning with HABITAT

An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

www.beginningwithhabitat.org

Primary Map 1

Water Resources & Riparian Habitats

Town of Carmel

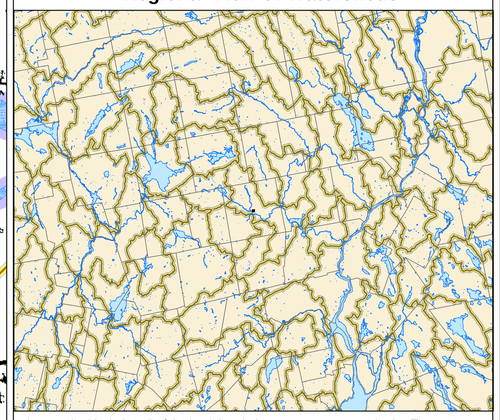
This map is non-regulatory and is intended for planning purposes only

LEGEND

This map depicts riparian areas associated with major surface water features and important public water resources. Developed areas may be located within some of the riparian areas shown. This map does not depict all streams or wetlands known to occur on the landscape and should not be used as a substitute for on the ground surveys. This map should be used as a planning reference only and is intended to illustrate the natural hydrologic connections between surface water features. Protecting riparian habitats protects water quality and can help to maintain habitat connections across the landscape.

- **Organized Township Boundary**
- **Unorganized Township** *(Beginning with Habitat does not provide data for unorganized townships)*
- **Public Water Supply Wells**
- **Subwatersheds** - Drainage divides are grouped together to form subwatersheds. See inset below for more information.
- **Drainage divides**- These are the smallest hydrologic units mapped in Maine. They contain watershed boundaries for most ponds and rivers in Maine.
- **Developed**- Impervious surfaces including buildings and roads
- **NWI Wetlands**- The National Wetlands Inventory (NWI) uses aerial photographs from the mid-1980s to identify wetlands based on remote sensing techniques of photo interpretation. This process did not result in a comprehensive mapping of wetland resources and typically under represents wetland occurrence on the landscape, especially forested wetlands. The presence of wetlands needs to be determined in the field prior to conducting activities that could result in wetland disturbance.
- **Streams and Brooks**
- **Ocean, Lakes, Ponds, and Rivers**
- **Riparian Habitat** - depicted by a 250-foot-wide strip around Great Ponds (ponds ≥10 acres in size), rivers, the coastline, and wetlands ≥10 acres in size and by a 75-foot-wide strip around streams. These areas identify *potential* riparian habitat only. In some places, riparian habitat may already be affected by development or otherwise degraded.
- **Source protection area**- Buffers that represent source water protection areas for wells and surface water intakes that serve the public water supply. Their size is proportional to population served and/or by the type of water supply system. These buffers range from 300 to 2,500 feet in radius.
- **Aquifers**- flow of at least 10 gallons per minute

Regional View of Watersheds



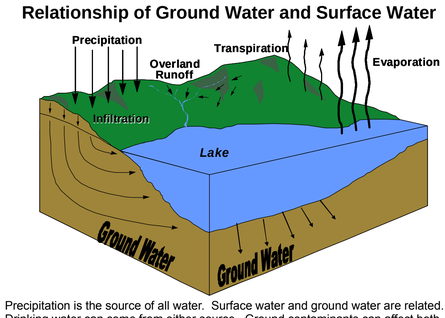
A watershed includes all of the land that drains to a common waterbody. The areas within the watershed are linked ecologically by the water, sediment, nutrients, and pollutants that flow through them. Watersheds can be grouped into larger drainages or divided into smaller ones. Each of these different sized "hydrological units" has a different name. Drainage divides (shown on main map as yellow line), which are the smallest units, generally drain into small ponds, wetlands, or streams. These units are grouped into subwatersheds (shown on both the main map and the above inset map by the yellow-brown-yellow outlines). Subwatersheds are grouped into watersheds, which are grouped into sub-basins. A sub-basin drains to a major waterbody like the Atlantic Ocean or the Penobscot River.

NRCS Subwatersheds (yellow-brown-yellow outlines)

0 5 10 15 20 25 Miles

Inset Scale - 1:500,000

Relationship of Ground Water and Surface Water



Precipitation is the source of all water. Surface water and ground water are related. Drinking water can come from either source. Ground contaminants can affect both. The relationship between ground water and surface water is part of the ***hydrologic cycle.*** ***Precipitation*** that falls from the atmosphere as rain or snow:

- -reaches the land surface and recharges rivers, lakes, wetlands, and other surface bodies of water directly through ***overland runoff***,
- -seeps into the ground through ***infiltration*** and eventually reaches the ground water,
- -evaporates from Earth's surface back into the atmosphere through ***evaporation***, or
- -evaporates from the leaves and stems of plants through ***transpiration***.

Shoreland Zoning

Maine's Mandatory Shoreland Zoning Act is intended to protect water quality, conserve wildlife habitat, and preserve the natural beauty of Maine's shoreline areas. Successful implementation requires local awareness of and appreciation for surface water resources and effective enforcement of setback and buffer requirements.

Maine's shoreland zones include, at a minimum, all land within:

- 250 feet of the high-water line of any pond over 10 acres, any river that drains at least 25 square miles, and all tidal waters and saltwater marshes;
- 250 feet of a freshwater wetland over 10 acres (except "forested" wetlands); and
- 75 feet of a stream that is either an outlet stream of a great pond, or located below the confluence of two perennial streams as depicted on a USGS topographic map.

Many towns opt to provide greater protection to their water resources by applying shoreland zone protections to additional resource types such as smaller streams and wetlands, or expanding shoreland zone buffer widths. Please contact your town for it's shoreland zoning regulations. For specific guidance regarding Maine's Mandatory Shoreland Zoning Act contact the Dept. of Environmental Protection Shoreland Zoning Unit: Richard Baker 207-287-3901 (Augusta), Michael Morse 207-822-6300 (Portland), Jennifer Cayer 207-941-4116 (Bangor). www.maine.gov/dep/blwq/docstand/szpage.htm

Data Sources

DATA SOURCE INFORMATION
(note: italicized file names can be downloaded from Maine Office of GIS)

TOWNSHIP BOUNDARIES
Maine Office of GIS (2006); *metwp24*

ROADS
Maine Office of GIS, Maine Department of Transportation (2005); *medotpub*

HYDROLOGY
Maine Office of GIS, U.S. Geological Survey (2004); *hyd24*

DEVELOPED
Maine Office of GIS, Maine Department of Environmental Protection (contact agency for this multiple agency collaboration) (2005); *imperv*

NATIONAL WETLANDS INVENTORY
Maine Office of GIS, U.S. Fish & Wildlife Service (1998); *nwi*

RIPARIAN BUFFERS
Maine Natural Areas Program (2005)

WELLS, WELL BUFFERS
Maine Office of GIS, Maine Department of Human Services-Drinking Water Program (2004); *wells, wellsbuf*

AQUIFERS
Maine Office of GIS, Maine Geological Survey (2006); *aquifer_polygons*

DRAINAGE DIVIDES
Maine Office of GIS (1994); *medrdvd*

DATA SOURCE CONTACT INFORMATION
Maine Office of GIS- http://apollo.ogis.state.me.us/catalog
Maine Natural Areas Program- http://www.maine.gov/doc/nrimc/mnap/
Maine Department of Transportation- http://www.maine.gov/mdot/
Maine Geological Survey- http://www.maine.gov/doc/nrimc/mgs/mgs.htm

DIGITAL DATA REQUEST
To request digital data for a town or organization, please visit our website.
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

State of Maine

Additional Funding:

5,000 2,500 0 0.5 1 Miles
Feet

Meters 1,000 500 0 0.5 1 Kilometers

1:24,000 Scale
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 29, 2009

Supported in part by Loon Conservation Plate funds

Beginning with HABITAT

An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

www.beginningwithhabitat.org

Primary Map 2

High Value Plant & Animal Habitats

Town of Carmel

This map is non-regulatory and is intended for planning purposes only

Descriptions of Labeled High Value Plant and Animal Habitats

No.	Feature Name	Status	No.	Feature Name	Status
1	Creeper	SC	3	Mountain-laurel	SC
2	Fall Fimbry	T			

COLOR CODES:
Rare Plant
Rare Animal Location/Habitat
Rare or Exemplary Natural Community
Essential Habitat

STATE STATUS:
E = Endangered
T = Threatened
PE = Possibly Extirpated
SC = Special Concern
E(B) = Endangered Breeding Population

LEGEND

The data presented here represent the best available information provided through Beginning with Habitat coalition partners at the time of map drafting. Map users should consult with the Beginning with Habitat program to verify that data illustrated on this map is still current prior to utilizing it for planning decisions. Habitat features illustrated on this map are based on limited field surveys, aerial photo interpretation, and computer modeling. Many areas have not been completely surveyed, so it is possible that features may be present that are not mapped. Habitat data sets are updated continuously. Not all habitats described below may occur in the area shown in this map. Also, please note that some of these habitats are regulated by the State of Maine through the Maine Endangered Species Act (Essential Habitats and threatened and endangered species occurrences) and Natural Resource Protection Act (Significant Wildlife Habitat). This map is intended for planning purposes only and should not be considered a comprehensive inventory of plant and animal occurrences. **We recommend consultation with MDIF&W Regional Biologists or MNAP Ecologists if activities are proposed that may affect at risk species, habitats, or natural communities depicted on this map.** Visit http://www.beginningwithhabitat.org/contacts/index.html for MDIFW or MNAP contact information.

Organized Township Boundary

Unorganized Township- Beginning with Habitat does not provide data for unorganized townships

Developed- Impervious surfaces such as buildings and roads

Streams and Brooks

Ocean, Lakes, Ponds, and Rivers

Rare, Threatened, or Endangered Wildlife

Known rare, threatened, or endangered species occurrence and/or the associated habitats based on species sightings.

Consult with an MDIFW regional biologist to determine the relative importance and conservation needs of the specific location and supporting habitat. For more information regarding individual species visit our website, http://www.maine.gov/ifw/wildlife/species/endangered_species/state_list.htm, for species specific fact sheets.

Rare or Exemplary Plants and Natural Communities

Rare Plant Locations

Known rare, threatened, or endangered plant occurrences are based on field observations. Consult with a Maine Natural Areas Program (MNAP) Ecologist to determine conservation needs of particular species. For more information regarding rare plants, the complete list of tracked species and fact sheets for those species can be found at: http://www.maine.gov/doc/nrimc/mnap/features/plantlist.htm.

Rare or Exemplary Natural Community Locations

The MNAP has classified and distinguished 98 different natural community types that collectively cover the state's landscape. These include such habitats as floodplain forests, coastal bogs, alpine summits, and many others. Each type is assigned a rarity rank of 1 (rare) through 5 (common). Mapped rare natural communities or ecosystems, or exemplary examples of common natural communities or ecosystems, are based on field surveys and aerial photo interpretation. Consult with an MNAP Ecologist to determine conservation needs of particular communities or ecosystems.

Essential Wildlife Habitats

Bald Eagle Nest Sites *or*
Roseate Tern Nesting Area *or*
Piping PloverLeast Tern Nesting, Feeding, & Brood-Rearing Area

Maine's Department of Inland Fisheries & Wildlife (MDIFW, www.state.me.us/ifw) maps areas currently or historically providing habitat essential to the conservation of endangered or threatened species as directed by the Maine Endangered Species Act (12 MRSA, Chapter 925, Subchapter 3, Sections 12804 and 12806) and regulations (MDIFW Rules, Chapter 8.05). Identification of Essential Habitat areas is based on species observations and confirmed habitat use.

Once an area becomes designated as Essential Habitat, the Maine Endangered Species Act requires that no state agency or municipal government shall permit, license, fund, or carry out projects that would significantly alter the habitat or violate protection guidelines adopted for the habitat. If a project occurs partly or wholly within an Essential Habitat, it must be evaluated by MDIFW before state and/or municipal permits can be approved or project activities can take place.

The Federal Endangered Species Act requires actions authorized, funded, or carried out by federal agencies be reviewed by the U. S. Fish and Wildlife Service. If your project occurs near an occurrence of the Atlantic salmon, bald eagle, roseate tern, piping plover, Canada lynx, New England Cottontail, Fubish's lousewort, or small-whorled pagonia contact the Maine Field Office, USFWS, 1168 Main St., Old Town, ME 04468.

Significant Wildlife Habitats

Deer Wintering Area

Forested area used by deer to avoid deep snow/cold (non-forested wetlands, non-stocked clearcuts, and deciduous- or larch-dominated stands less than 10-acres in size may be included within the habitat polygon as drawn).

Inland Waterfowl/Wading Bird

Freshwater breeding, migration/staging, and wintering habitats for inland waterfowl or breeding, feeding, loafing, migration, or roosting habitats for inland wading birds.

Seabird Nesting Island

An island, ledge, or portion thereof in tidal waters with documented, nesting seabirds or suitable nesting habitat for endangered seabirds.

Shorebird Areas

Coastal staging areas that provide feeding habitat like tidal mud flats or roosting habitat like gravel bars or sand spits for migrating shorebirds

Tidal Waterfowl/Wading Bird

Breeding, migrating/staging, or wintering areas for coastal waterfowl or breeding, feeding, loafing, migrating, or roosting areas for coastal wading birds. Tidal Waterfowl/Wading Bird habitats include aquatic beds, eelgrass, emergent wetlands, mudflats, seaweed communities, and reefs.

Significant Vernal Pools

A pool depression used for breeding by amphibians and other indicator species and that portion of the critical terrestrial habitat within 250 ft of the spring or fall high water mark. A vernal pool must have the following characteristics: natural origin, non-permanent hydroperiod, lack permanently flowing inlet or outlet, and lack predatory fish.

Maine's Natural Resources Protection Act (NRPA, 1988) administered by the Maine Department of Environmental Protection (MDEP; http://www.maine.gov/dep/blwq/docstand/nrpapage.htm) is intended to prevent further degradation and loss of natural resources in the state including the above Significant Wildlife Habitats that have been mapped by MDIFW. DEP has regulated activities in, on, or over these habitats to the extent these habitats were located within another protected natural resource, such as a freshwater or coastal wetland, since September 17, 2005. DEP has regulated activities in, on, or over these habitats, located outside other protected natural resources, to the extent they meet criteria adopted in rule since June 8, 2006 (38 MRSA 480-B(10)).

Atlantic Salmon Spawning/Rearing Habitat

Atlantic Salmon Rearing Habitat

Atlantic Salmon Spawning Habitat

Atlantic Salmon Limited Spawning Habitat

Mapped by Atlantic Salmon Commission (ASC) and US Fish & Wildlife Service (USFWS) from field surveys on selected Penobscot and Kennebec River tributaries and the Dennys, Ducktrap, East Machias, Machias, Pleasant, Narraguagus, and Sheepscot Rivers.

High Value Habitat for Priority Trust Species

These feature categories depict the highest value habitat as predicted by the U.S. Fish and Wildlife Service (USFWS) Gulf of Maine Program's Habitat Suitability Model.

This data layer portrays the highest value habitat from the Gulf of Maine Watershed Habitat Analysis, a habitat suitability model developed by the (USFWS) Gulf of Maine Coastal Program. The analysis evaluated existing field data and scientific literature for 91 species of fish, wildlife, and plants important to USFWS in the Gulf of Maine watershed and ranked the landscape based on potential habitat for each species. This theme shows only the most important habitat (top 25%) for all species combined and excludes areas less than 5 acres. For more information please see Map 8 "Valuable Habitats for USFWS Priority Trust Species." For more information about the Gulf of Maine Watershed Habitat Analysis please visit: http://www.fws.gov/northeast/gulfofmaine.

Data Sources

DATA SOURCE INFORMATION
(note: italicized file names can be downloaded from Maine Office of GIS)

TOWNSHIP BOUNDARIES
Maine Office of GIS (2006); *metwp24*

ROADS
Maine Office of GIS, Maine Department of Transportation (2005); *medotpub*

HYDROLOGY
Maine Office of GIS, U.S. Geological Survey (2004); *hyd24*

DEVELOPED
Maine Office of GIS, Maine Department of Environmental Protection (contact agency for this multiple agency collaboration) (2005); *imperv*

ESSENTIAL & SIGNIFICANT WILDLIFE HABITATS
Maine Office of GIS, Maine Department of Inland Fisheries & Wildlife; *eheagle, ehplvtrn, ehrtern, sni*

RARE NATURAL COMMUNITIES & PLANTS
Maine Natural Areas Program

ATLANTIC SALMON HABITAT
Maine Office of GIS, Maine Atlantic Salmon Commission, U.S. Fish & Wildlife Service (2006); *ashab3*

HIGH VALUE HABITAT FOR PRIORITY TRUST SPECIES
Maine Office of GIS, U.S. Fish & Wildlife Service; *forest91, fresh91, grass91, saline91*

DATA SOURCE CONTACT INFORMATION
Maine Office of GIS- http://apollo.ogis.state.me.us/catalog
Maine Natural Areas Program- http://www.maine.gov/doc/nrimc/mnap/
Maine Department of Inland Fisheries & Wildlife- http://www.maine.gov/ifw/
U.S. Fish & Wildlife Service- Gulf of Maine Program- http://gulfofmaine.fws.gov
Maine Atlantic Salmon Commission- http://www.maine.gov/asc/
Maine Department of Transportation- http://www.maine.gov/mdot/

DIGITAL DATA REQUEST
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http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

State of Maine

Maine Coastal Program

The Nature Conservancy

Maine Audubon

Maine Coast Heritage Trust
A Statewide Land Conservation Organization

Additional Funding:

MaineDOT

5,000 2,500 0 0.5 1 Miles
Feet
Meters 1,000 500 0 0.5 1 Kilometers

1:24,000 Scale
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife
April 29, 2009

Supported in part by Loon Conservation Plate funds

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An Approach to Conserving Maine's Natural Space for Plants, Animals, and People

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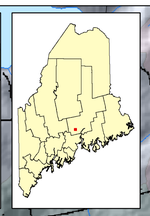
Supplementary Map 7

Wetlands Characterization

Town of Carmel

This map is non-regulatory and is intended for planning purposes only



LEGEND

This map depicts all wetlands shown on National Wetland Inventory (NWI) maps, but categorized them based on a subset of wetland functions. This map and its depiction of wetland features neither substitute for nor eliminate the need to perform on-the-ground wetland delineation and functional assessment. In no way shall use of this map diminish or alter the regulatory protection that all wetlands are accorded under applicable State and Federal laws.
For more information about wetlands characterization, contact Elizabeth Hertz at the Maine State Planning Office (207-287-8061, elizabeth.hertz@maine.gov).

The State Planning Office (SPO) Wetlands Characterization is a planning tool intended to help identify likely wetland functions associated with significant wetland resources and adjacent uplands. Using GIS analysis, this map provides basic information regarding what ecological services various wetlands are likely to provide. These ecological services, each of which has associated economic benefits, include: floodflow control, sediment retention, finfish habitat, and/or shellfish habitat. There are other important wetland functions and values not depicted in this map.
Refer to www.maine.gov/dep/blwq/docstand/ipwetfv2.htm for additional information regarding wetland functions and values. Forested wetlands and small wetlands such as vernal pools are known to be underrepresented in the National Wetlands Inventory (NWI) data used to create this map. The model developed to estimate the functions provided by each wetland could not capture every wetland function or value. Therefore, it is important to use local knowledge and other data sources when evaluating wetlands, and each wetland should be considered relative to the whole landscape/watershed when assessing wetland resources at a local level.

Visit the Maine Wetlands Characterization internet mapping application at:
http://megisims.state.me.us/website/spowetc/viewer.htm

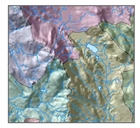
Organized Township Boundary

Developed- Impervious surfaces including buildings and roads

Unorganized Township *(Beginning with Habitat does not provide data for unorganized townships)*

Streams and Brooks

Ocean, Lakes, Ponds, and Rivers



Subwatersheds- The shaded, background polygons are subwatersheds (areas that drain to a particular lake, wetland, pond, river, stream, or the ocean). The subwatersheds are shaded to show topographic relief. This "hillshading" assumes the sun is shining from the northwest, so ridgetops and northwest-facing slopes appear light, whereas valleys and southeast-facing slopes appear dark. Because many areas of Maine are relatively flat, the topographic relief shown here has been exaggerated to make the details easier to see.

Wetland Functions: fill pattern

Some wetlands may have more than one funtion (fill pattern)

RUNOFF / FLOODFLOW ALTERATION
Wetlands provide natural stormwater control capabilities. As natural basins in the landscape, wetlands are able to receive, detain, and slowly release stormwater runoff. Wetland shelves along stream banks naturally regulate flood waters by providing an area for swollen stream flows to expand and slow, thereby protecting downstream properties. This map assigns Runoff/Floodflow Alteration Functions to wetlands that are (a) contained in a known flood zone, (b) associated with a surfacewater course or waterbody, and (c) with slope < 3%.
AND/OR
EROSION CONTROL / SEDIMENT RETENTION
Wetlands act as natural sponges that can hold water, allowing suspended particles such as sediment to settle out. The dense vegetation in most wetlands helps to stabilize soil and slow water flows, thereby reducing scouring and bank erosion. This map assigns Erosion Control / Sediment Retention functions to wetlands with (a) slope < 3%; (b) emergent vegetation; and (c) close proximity to a river, stream, or lake.

FINFISH HABITAT
Wetlands with documented finfish populations, including wetlands adjacent to a river, stream, or lake.
AND/OR
SHELLFISH HABITAT
Inland wetlands and streams can directly affect the status of coastal shellfish harvest areas. Fecal coliform bacteria and waterborne nutrients resulting from land use changes away from the coast can travel via surface water to harvestable flats. One failed septic system near a stream could close a mudflat several miles away. Excessive nutrients can reduce water clarity and stimulate epiphytic growth that degrades eelgrass meadows. Conservation of freshwater wetlands and stream buffers in coastal watersheds is a key component in marine resource conservation. This map assigns a Shellfish Habitat function to wetlands within 0.5 miles of (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds OR palustrine wetlands directly connected by a stream of < 0.5 mile in length to (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds.

PLANT/ANIMAL HABITAT
Nearly all wildlife species, and many of Maine's plant species, depend on wetlands during some part of their life cycle. For the purposes of this map, wetlands containing open water or emergent vegetation, 3 or more wetland vegetation classes (see below), and within ¼ mile of a known rare, threatened, or endangered plant or animal occurrence, within ¼ mile of a mapped significant or essential habitat, or within ¼ mile of a rare or exemplary natural community have been assigned this function. Rare element occurrences and mapped habitats can be found on Map 2 High Value Plant & Animal Habitats.

OTHER FUNCTIONS
CULTURAL/EDUCATIONAL- Wetlands within ¼ mile of a boat ramp or school have been assigned this value as these wetlands are likely candidates for use as outdoor classrooms, or similar social benefit. Wetlands rated for other functions listed above may also demonstrate cultural/educational values although not expressly shown.
OR
NO DOCUMENTED FUNCTION- The basis of this characterization is high altitude aerial photos. Photo quality often limits the information that can be interpreted from small wetland features, or those with dense canopy cover. Although not assigned a function under this study, ground surveys may reveal that these wetlands have multiple functions and values.

Wetland Class: fill color

Aquatic Bed (floating or submerged aquatic vegetation), Open Water

Emergent (herbaceous vegetation), Emergent/Forested Mix (woody vegetation >20 ft tall), Emergent/Shrub-Scrub Mix (woody vegetation <20 ft tall)

Forested, Forested/Shrub-scrub

Shrub-scrub

Other (rocky shore, streambed, unconsolidated shore, reef, rocky bottom)

National Wetlands Inventory (NWI) maps (the basis of wetlands shown on this map) are interpreted from high altitude photographs. NWI Wetlands are identified by vegetation, hydrology, and geography in accordance with "Classification of Wetlands and Deepwater Habitats" (FWS/OBS-79/31, Dec 1979). The aerial photographs document conditions for the year they were taken. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State, or local government. NWI maps depict general wetland locations, boundaries, and characteristics. They are not a substitute for on-ground, site-specific wetland delineation.

Data Sources

DATA SOURCE INFORMATION
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TOWNSHIP BOUNDARIES
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DEVELOPED
Maine Office of GIS, Maine Department of Environmental Protection (contact agency for this multiple agency collaboration) (2005); *imperv*
NATIONAL WETLANDS INVENTORY (NWI)
Maine Office of GIS (1998); *nwi*
DRAINAGE DIVIDES
Maine Office of GIS (1994); *medrdvd*

DATA SOURCE CONTACT INFORMATION
Maine Office of GIS- http://apollo.ogis.state.me.us/catalog
Maine Department of Transportation- http://www.maine.gov/mdot/
Maine State Planning Office- http://www.maine.gov/spo/
Maine Geological Survey- http://www.maine.gov/doc/nrimc/mgs/mgs.htm

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State of Maine

Additional Funding:

Maine Coast Heritage Trust — A Statewide Land Conservation Organization

The Nature Conservancy — Saving the last great places on earth

Maine Audubon

MaineDOT

5,000 2,500 0 0.5 1 Miles
Feet
Meters 1,000 500 0 0.5 1 Kilometers

1:24,000 Scale
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife

May 1, 2009

Supported in part by Loon Conservation Plate funds

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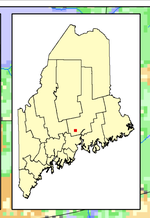
www.beginningwithhabitat.org

Supplementary Map 8

USFWS Priority Trust Species Habitats

Town of Carmel

This map is non-regulatory and is intended for planning purposes only



LEGEND

For more information about U.S. Fish & Wildlife Service Priority Trust Species, contact Bob Houston at the U.S. Fish & Wildlife Service Gulf of Maine Coastal Program (207-781-8364, robert_houston@fws.gov).

Introduction

This map identifies potentially valuable habitat for U.S. Fish and Wildlife Service (USFWS) Priority Trust Species based on the Gulf of Maine Watershed Habitat Analysis developed by the USFWS Gulf of Maine Coastal Program. This analysis was completed for the United States portion of the Gulf of Maine watershed that includes all of Maine, most of New Hampshire, and the eastern third of Massachusetts.

Habitat Types and Importance

Township Boundary

Unorganized Township *(Beginning with Habitat does not provide data for unorganized townships)*

Developed- Residential, Industrial, Commercial, and Roads

Streams and Brooks

Ocean, Lake, Pond, and River Boundaries

Habitats

Saltmarsh/saltwater
- 1 - 49%
- 50 - 74%
- Top 25% (most important)

Freshwater wetlands *(excludes forested wetlands)*
- 1 - 49%
- 50 - 74%
- Top 25% (most important)

Grassland/shrub/bare ground
- 1 - 49%
- 50 - 74%
- Top 25% (most important)

Forested *(includes forested wetland)*
- 1 - 49%
- 50 - 74%
- Top 25% (most important)

Priority Trust Species

The 91 USFWS Gulf of Maine Priority Trust Species include animals and plants that regularly occur in the Gulf of Maine watershed and meet any of the following criteria:
- Federally endangered, threatened, or candidate species
- Migratory birds, sea-run fish and marine fish that: Show significant and persistent declining population trends, OR have been identified as endangered or threatened by 2 or 3 states in the Gulf of Maine watershed
- Species of concern as identified in the U.S. Shorebird Conservation Plan, Colonial Waterbird Plan or Partners in Flight

The priority list of trust species is (* denotes high value habitat in your town/region with the potential to support this species):

BIRDS
American bittern *
American black duck *
American oystercatcher
American woodcock *
Arctic tern
Bald eagle *
Baltimore oriole *
Bay-breasted warbler *
Bicknell's thrush
Black scoter
Black tern *
Black-bellied plover
Blackburnian warbler *
Blackpoll warbler
Black-throated blue warbler *
Blue-winged warbler
Buff-breasted sandpiper *
Canada warbler *
Cape May warbler *
Chestnut-sided warbler *
Common loon *
Common snipe *
Common tern
Eastern meadowlark *
Field sparrow *
Golden-winged warbler
Grasshopper sparrow *
Hudsonian godwit
Killdeer *
Least sandpiper
Least tern
Little blue heron
Little gull

BIRDS (cont'd)
Louisiana waterthrush *
Marsh wren *
Nelson's sharp-tailed sparrow
Northern flicker *
Northern goshawk *
Northern harrier *
Olive-sided flycatcher *
Osprey *
Peregrine falcon *
Pied-billed grebe *
Piping plover
Prairie warbler *
Purple sandpiper
Razorbill
Red crossbill *
Red-headed woodpecker
Red knot
Red-shouldered hawk *
Roseate tern
Ruddy turnstone
Saltmarsh sharp-tailed sparrow
Sanderling
Scaup (greater and lesser) *
Seaside sparrow
Sedge wren *
Semipalmated sandpiper
Short-billed dowitcher
Short-eared owl *
Snowy egret
Solitary sandpiper *
Spruce grouse *
Surf scoter
Tricolored heron

BIRDS (cont'd)
Upland sandpiper *
Veery *
Whimbrel *
Whip-poor-will *
White-winged scoter
Wood duck *
Wood thrush *
Yellow rail *

FISHERIES
Alewife *
American eel *
American shad *
Atlantic salmon *
Atlantic sturgeon
Blueback herring
Bluefish
Horseshoe crab
Shortnose sturgeon
Winter flounder

PLANTS
Eastern prairie fringed orchid
Furbish's lousewort
Robbins' cinquefoil
Small whorled pogonia

MAMMAL
Canada lynx

REPTILE
Plymouth redbelly turtle

Mapping Valuable Habitat

Using a Geographic Information System (GIS), valuable habitat was mapped by combining field sightings (collected by various agencies and non-governmental organizations) and habitat modeling. Frequently, sightings are too limited to adequately represent all habitat used. Therefore, habitat models based on selected environmental conditions can be helpful in more fully predicting potential habitat utilization.

To create the final map shown on this page, we first identified habitat for each of the 91 species in the analysis and ranked its importance on a scale of one to ten, with ten being considered the most important. Next, we combined the scores for each of the species to create a sum of scores. Then, we subdivided the sum of scores into the four basic habitat types shown on this map. Finally, we portrayed the data in a three level gradient (the top 25%, the next 25%, and then, the bottom 50% of the habitat value for each habitat type). The top 25% may be considered the most important habitat in that gradient.

Uses of the Data

This map may be used in combination with other data sources to help identify potentially valuable wildlife habitat at the local or town level. This information can be incorporated into town comprehensive planning or open space planning. It may also be used to help prioritize habitat protection by local land protection organizations or to support grants for habitat protection. This map represents only one possible way of portraying the model results; there are many other maps that may be derived from the data. Please contact the Gulf of Maine Coastal Program for more information and assistance.

Limitations of the Data

Maps of habitats for individual species are limited by the accuracy and timeliness of the data sets used in developing them and by the validity of models used to interpret those data. We used the most recent data available and relied on species experts to review the models. We also tested predicted habitats using occurrence data. Habitat maps rely quite extensively on land cover and the land cover used for this project is based on the interpretation of 1993 satellite imagery with a resolution of 30 meters (each pixel on the map is about 1/4 acre). It is important to realize that if land cover has changed significantly since 1993 in a given area, the predicted habitat value for individual species may no longer be reliable. We must also emphasize that this map only depicts predicted high value habitat for the species included in the analysis; important habitat may exist for other species not included in this analysis. Other important USFWS habitat of significance includes Nationally Significant Maine Coastal Nesting Islands, areas around National Wildlife Refuges, and specific endangered species habitat. There also may be important habitat information available from state conservation agencies or other environmental organizations. In addition, this map does not show buffer zones that should be included to protect valuable wildlife habitat.

For More Information

The Gulf of Maine Coastal Program can provide more information that will help support your habitat protection initiatives. This includes detailed parcel-specific maps, detailed tables delineating habitat importance for each of the 91 species and assistance in grant-writing for some habitat portection grants. For more information please contact us or see our website http://www.fws.gov/northeast/gulfofmaine.

Data Sources

DATA SOURCE INFORMATION

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HIGH VALUE HABITAT FOR PRIORITY TRUST SPECIES
U.S. Fish & Wildlife Service-Gulf of Maine Coastal Program; *forest91*, *fresh91*, *grass91*, *saline91*, *gomlc7*

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State of Maine

Additional Funding:

5,000 2,500 0 0.5 1 Miles
1,000 500 0 0.5 1 Kilometers

1:24,000 Scale
Universal Transverse Mercator (UTM) Projection
North American Datum (NAD) 1983

Supported in part by Maine Outdoor Heritage Fund lottery ticket sales

Map Prepared by Maine Department of Inland Fisheries & Wildlife
May 1, 2009

Supported in part by Loon Conservation Plate funds

Known Archaeological Sites* and Areas Sensitive for Archaeology* in

Carmel

information provided by Maine Historic Preservation Commission April 2009

*dated material subject to future revision

map 1/1

Areas sensitive for prehistoric archaeology

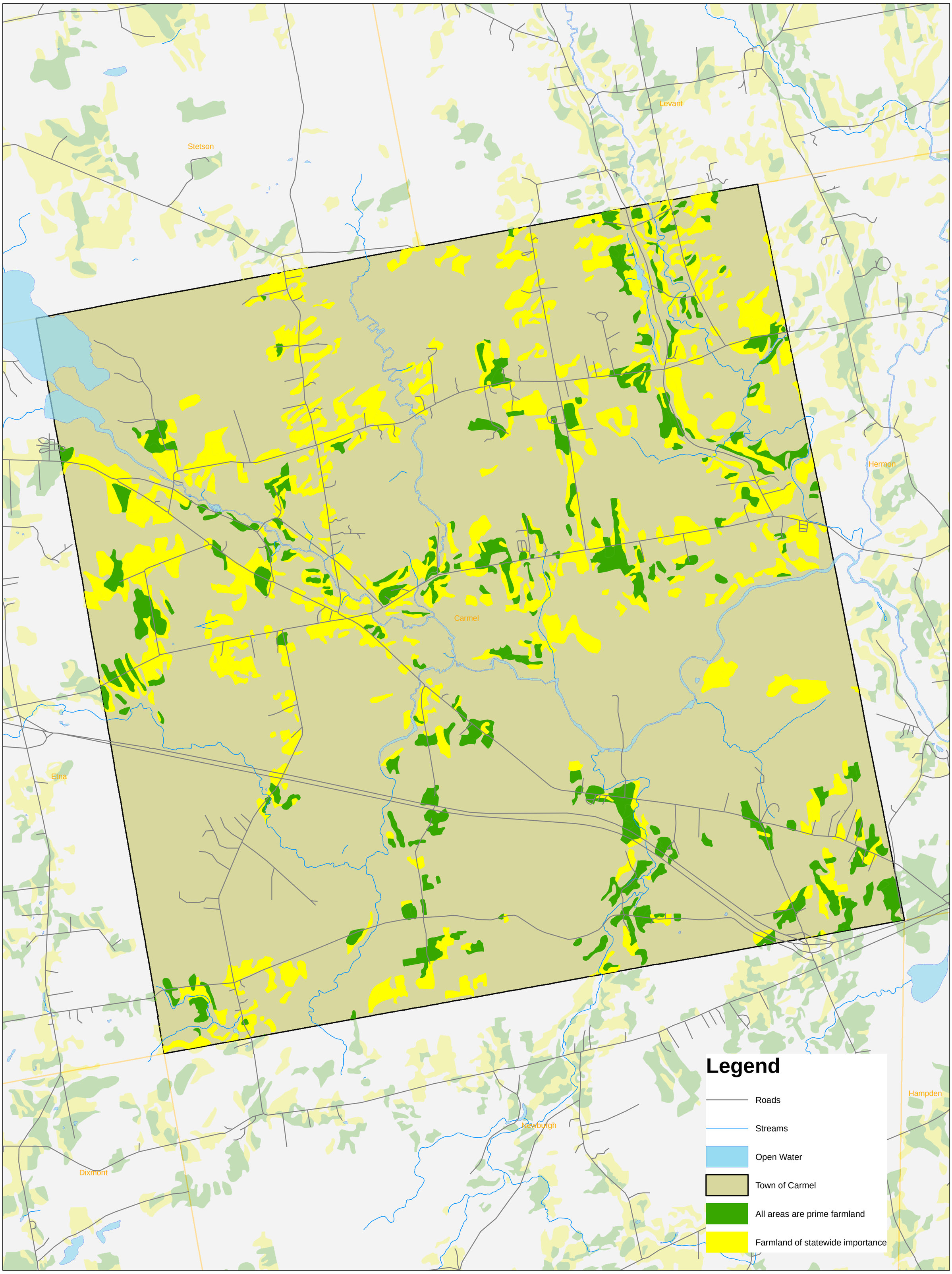
1/2 k square intersecting a known historic archaeological site.

The town of Carmel has not been mapped for historic archaeological sensitivity at this time

there are no known prehistoric archaeological sites in Carmel at this time

0 0.5 1 2 3 4 5 Kilometers

Distribution of Prime Farmland and Farmland of Statewide Importance for the Town of Carmel Maine

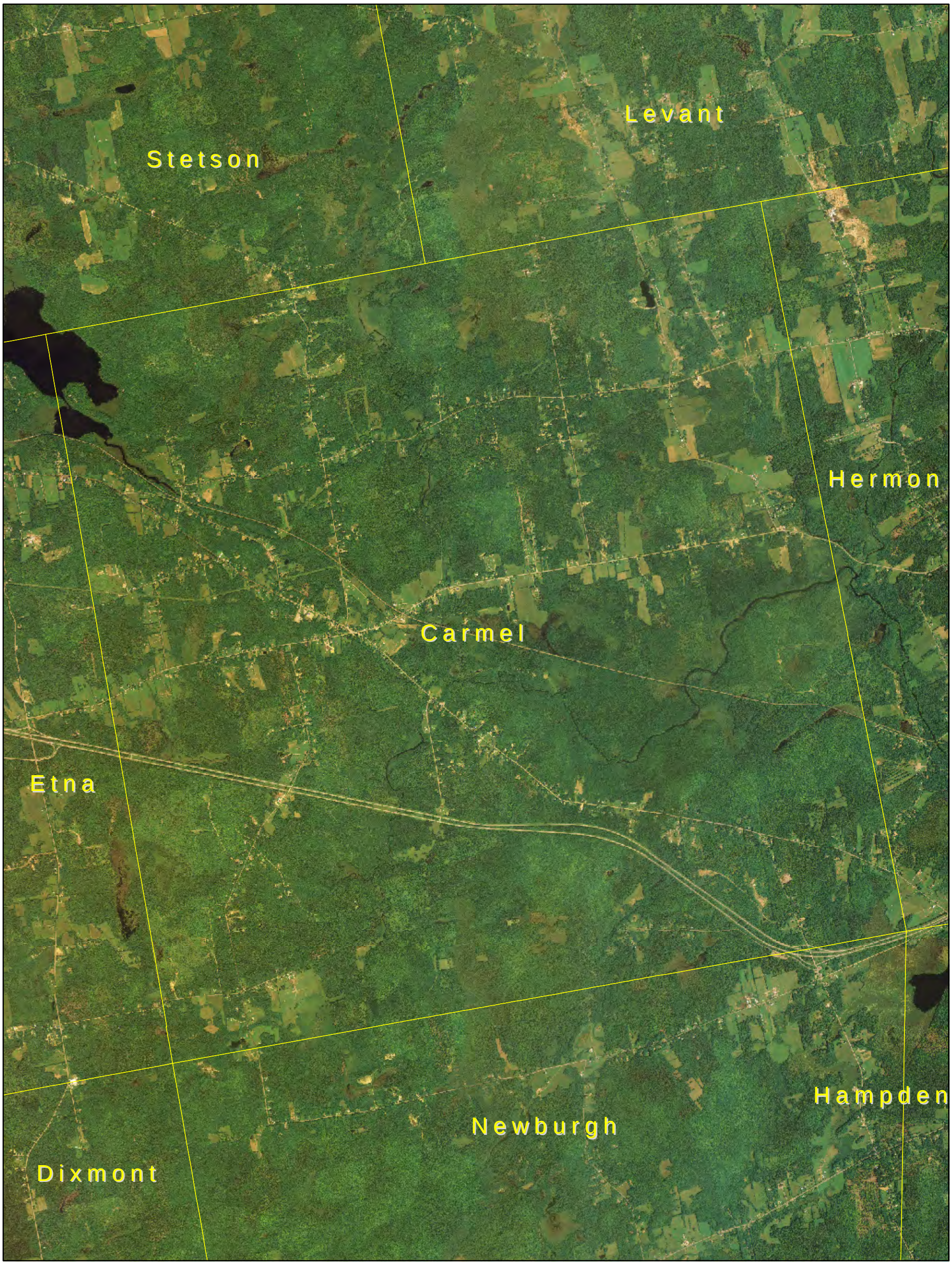


Prime Farmland 1309 acres (6%)
Farmland Of Statewide Importance 3032 acres (13%)
Town Of Carmel 23,594 acres

1:24,000

Source:
Soil Survey Geographic Data Base (SSURGO)
UTM projection Zone 19 NAD 1983

USDA NRCS Natural Resources Conservation Service



Aerial Photography - 2006
Town of Carmel

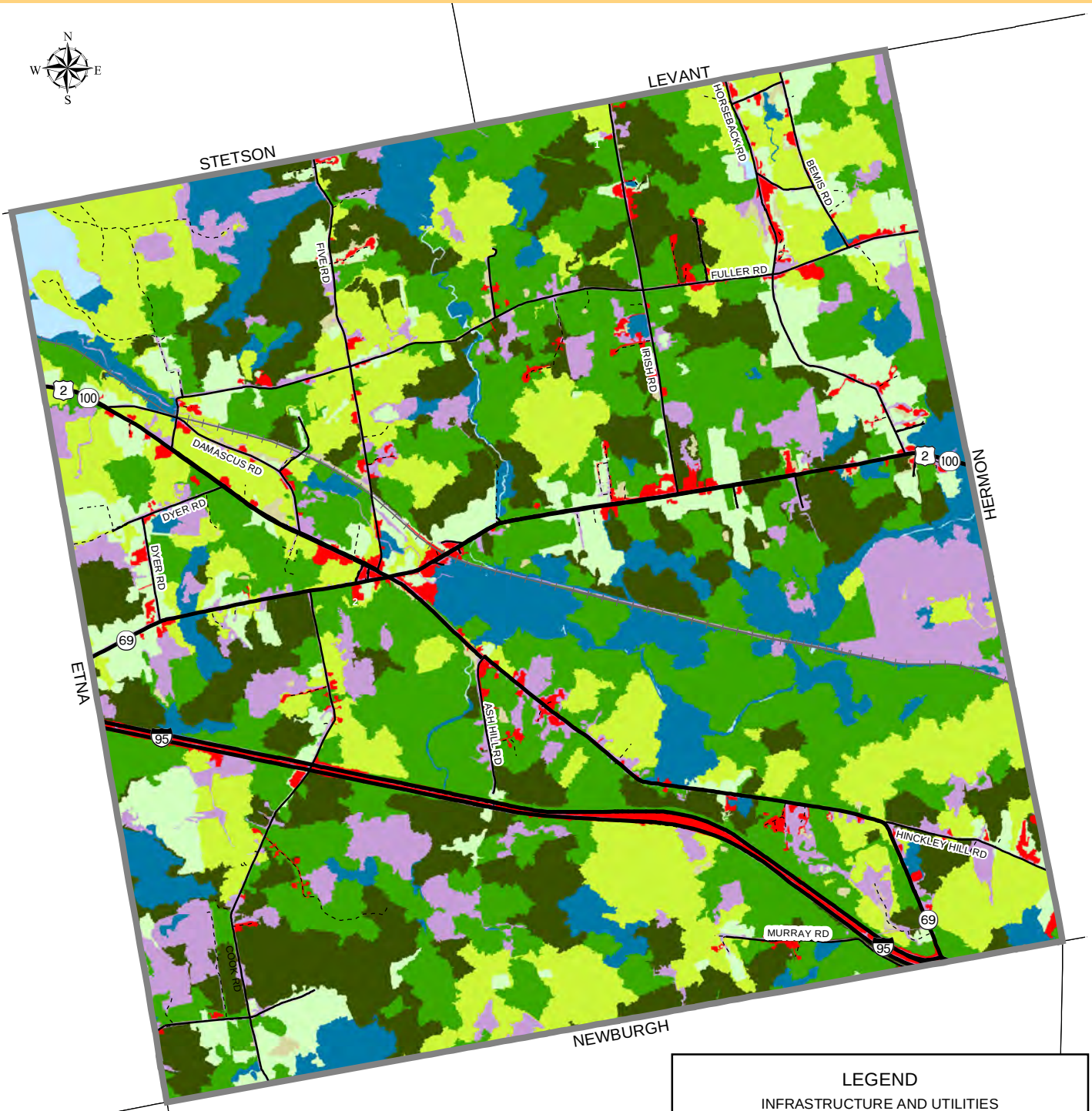
N
W E
S

0 4,000 8,000 12,000
Feet

Spring 2009 1:48,000 1 inch = 4,000 feet

Land Cover Map

Town of Carmel



0 0.5 1 Miles

Sources: Jointly funded and supported by USGS, NOAA, EPA, MEDEP, MESPO, MEIFW, MEDOT, MEDHHS, MEGIS and the Maine GeoLibrary Board.
Map revised: November, 2010

LEGEND

INFRASTRUCTURE AND UTILITIES

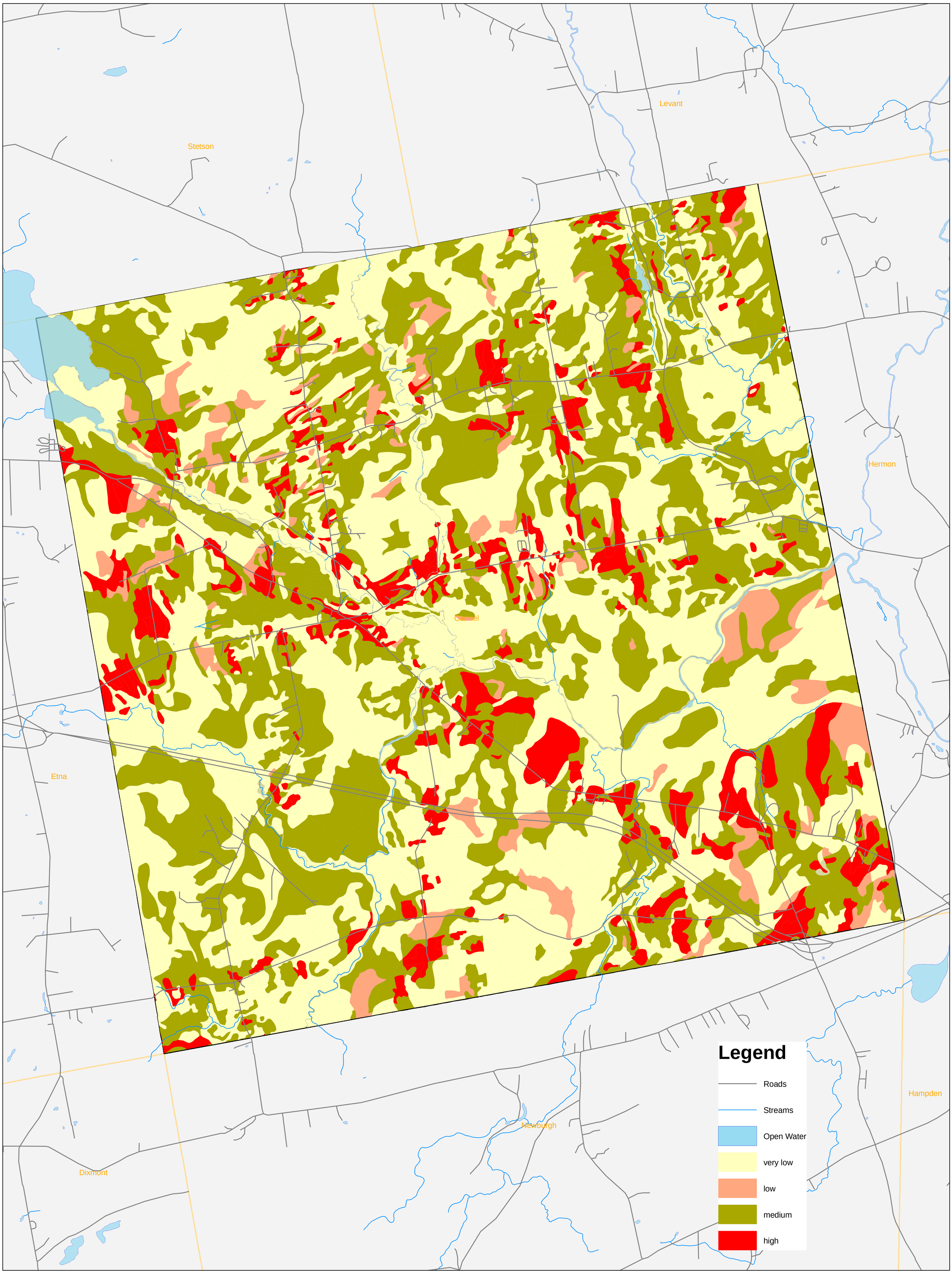
- State roads
- Town roads
- Private roads/Trails
- Railroads

LAND COVER CLASSIFICATION

- Cultivated Crops and Pasture/Hay
- Developed Land (High, Medium, Low and Open)
- Forest (Deciduous)
- Forest (Mixed)
- Forest (Evergreen)
- Grassland/Herbaceous and Scrub/Shrub
- Open Water
- Other *
- Wetlands and Wetland Forest

** Other includes bare land, heavy partial cut, light partial cut, recent clearcut, regenerating forest, roads/runways, and unconsolidated shore.*

Soil Potential For Low Density Development
for the Town of Carmel Maine



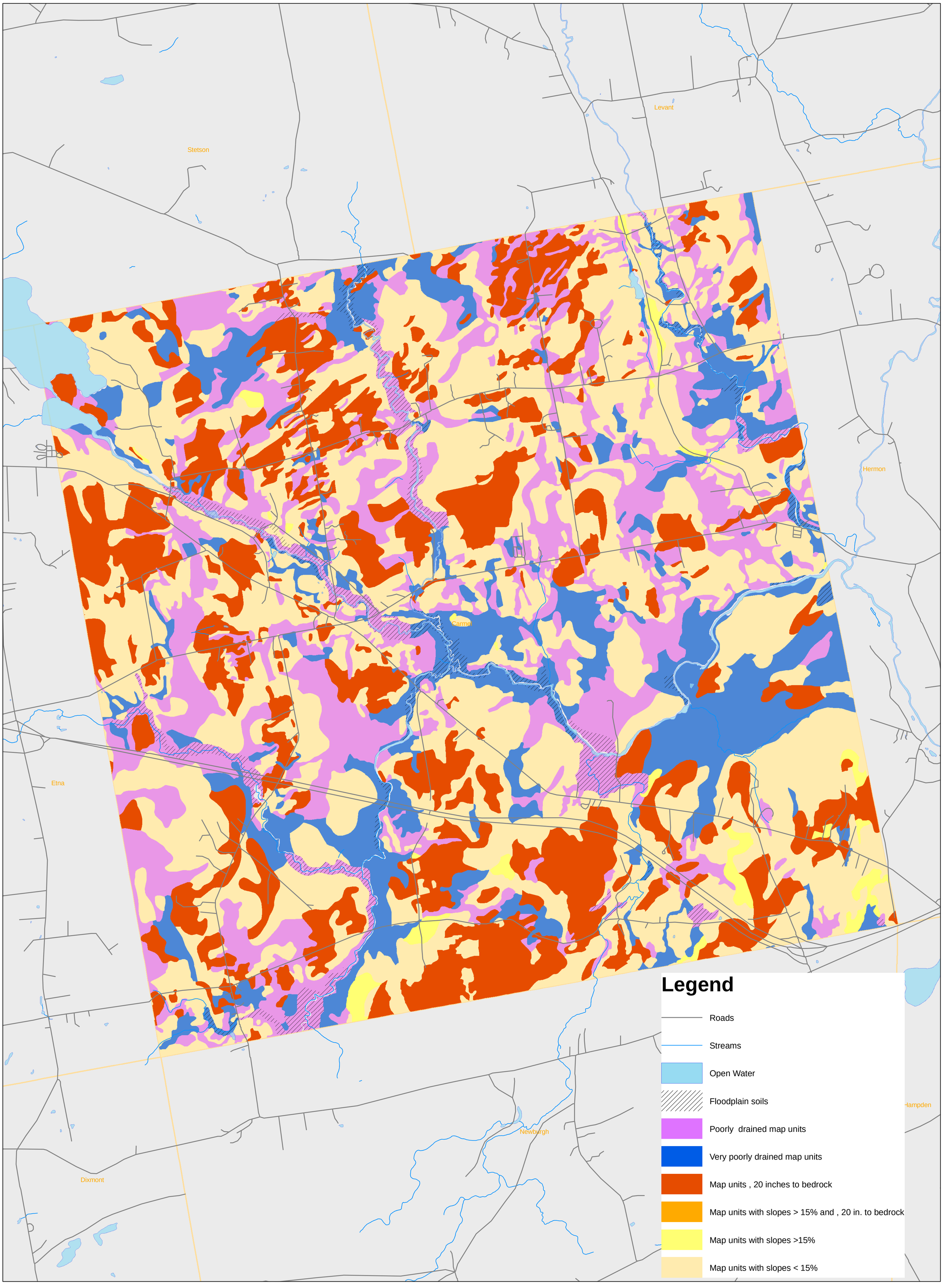
Very Low Potential 11,355 acres (48%)
Low Potential 1,022 acres (4%)
Medium Potential 8,759 acres (37%)
High Potential 2,123 acres (9%)
Town Of Carmel 23,594 acres

1:24,000

Source:
Soil Survey Geographic Data Base (SSURGO)
UTM projection Zone 19 NAD 1983

USDA NRCS Natural Resources Conservation Service

Environmental Constraints for the Town of Carmel Maine



Floodplain soils 913 acres (4%)
Poorly drained 4,766 acrres (20%)
Very poorly drained 3,386 acres (14%)
20 inches to bedrock 4,397 acres (19%)
20 inches to bedrock & slopes > 15% 312 acres (1%)
slopes > 15% 289 acres (1%)
slopes < 15% 22,666 acres (96%)
Town Of Carmel 23,594 acres

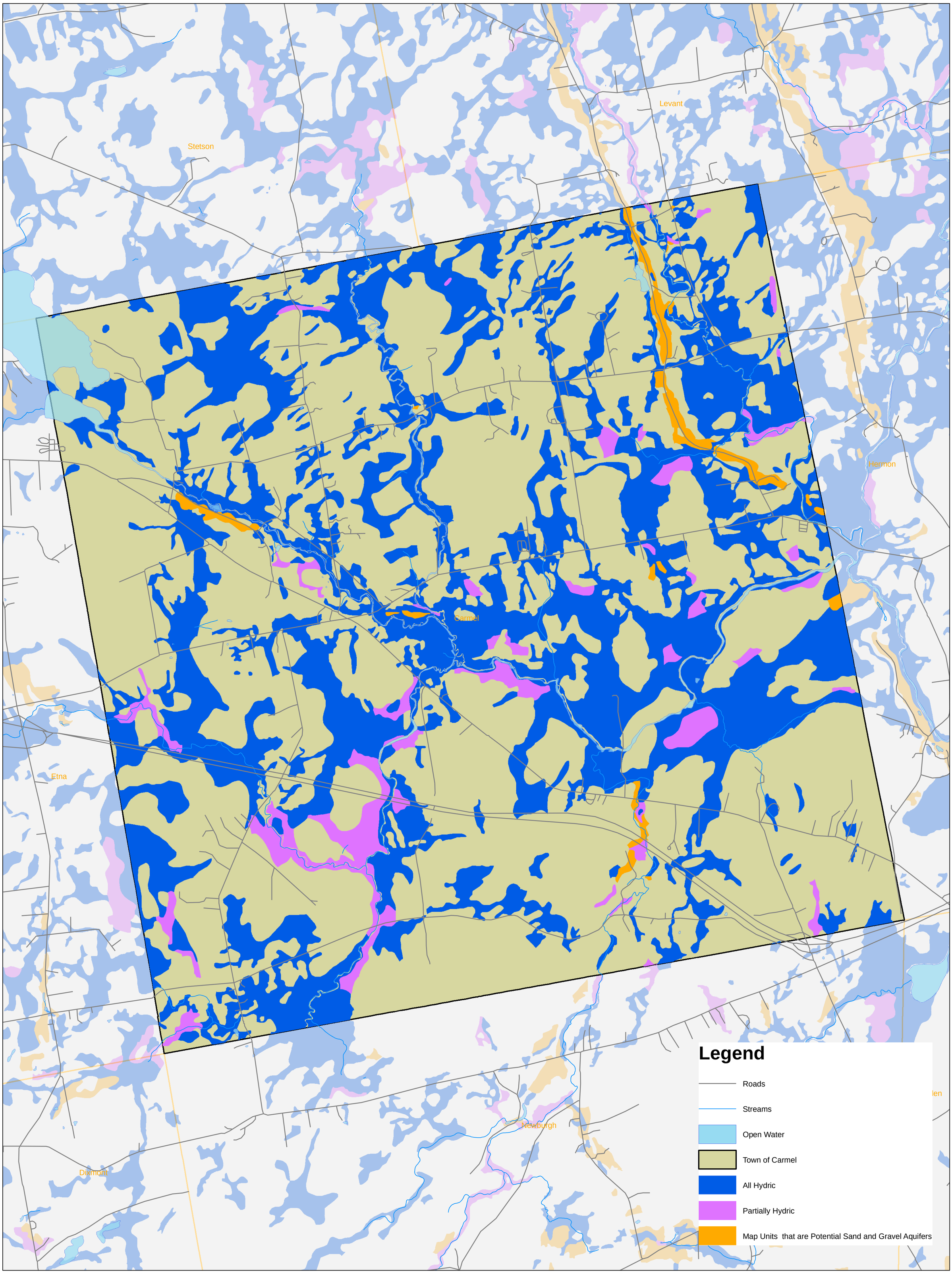
1:24,000

Source:
Soil Survey Geographic Data Base (SSURGO)
UTM projection Zone 19 NAD 1983

USDA NRCS Natural Resources Conservation Service

USDA is an equal opportunity provider

Natural Resources Map for the Town of Carmel Maine



1:24,000

Hydric 7,421 acres (31%)
Partially Hydric 730 acres (3%)
Potential for Sand and Gravel Aquifer 231 acres (1%)
Town Of Carmel 23,594 acres

Source:
Soil Survey Geographic Data Base (SSURGO)
UTM projection Zone 19 NAD 1983

USDA NRCS Natural Resources Conservation Service

100 Year Flood Zone
500 Year Flood Zone
Public Water Watersheds
National Wetlands Inventory
All hydric
Partially hydric

Development Constraints
Town of Carmel

0 4,000 8,000 12,000 Feet

Spring 2009 1:48,000 1 inch = 4,000 feet