

Enhancing Londonderry's Environment

Introduction and Setting

For the purposes of this plan, the term “natural environment” is used to broadly discuss Londonderry’s air, water, and land resources including, but not limited to the town’s scenery, air quality, aquifers, streams, soils, plants, and animals. These features form an integrated, continuous natural network or matrix in which the town’s built environment and its key cultural and historic artifacts are embedded. This matrix provides the ecosystem services required to sustain a livable Londonderry. Key features within this matrix serve as anchors that are sources of plant and animal stocks, replenishing other areas within the town. These anchors include, but are not limited to: Scobie Pond; the Musquash Conservation Area; the Little Cohas Marsh; Beaver, Cohas, Nesenkeag, and Watts Brooks; the Bockes/Ingersoll Forest, and the hayfields, orchards and farms of central Londonderry, all of which are shown on the Environmental Resources Map (map #6). While the policies and recommendations suggested in other sections of this plan will have some type of impact on the town’s natural environment, this section deals specifically with the actions Londonderry can take to protect the natural resources needed to sustain a livable Londonderry.



Peat Bog – along Route 28 in Londonderry

Issues

Londonderry has changed dramatically over the last 30 years – and these changes have not occurred without impact to the natural environment. The change in Londonderry’s built footprint can be most easily seen in Map #3 (shows the built land in Londonderry in 1962, 1974, and 1998) discussed in the land use section of this plan. Essentially, each structure (whether it’s a house, commercial operation, a school, or a road) has altered the natural environment

in some way. While Londonderry sustains a pattern of relatively low-density growth, there has been only limited use of “Smart Growth” principles for site development. Furthermore, zoning regulations have not significantly guided development away from environmental features such as aquifers and their recharge areas or prevented fragmentation of open spaces. As a consequence, there is the potential for adverse impacts to water quality due to development and pollution, primarily in the form of non-point source runoff. This is of particular concern since many residents and businesspeople rely on septic systems for sewage disposal and wells for their drinking water needs.

In addition to water quality, development presents a serious threat to other features of the natural environment such as plant and animal populations, due to habitat fragmentation. Over the past two decades Londonderry has achieved a significant success in land protection and conservation of habitats, agricultural soils, and other natural resources (primarily through the use of easements and land purchase). However, most of these areas are relatively isolated and are not linked to town-wide or regional ecological systems.



One of Mack's Apples pick-your-own orchards in Londonderry

Finally, Londonderry's history is closely tied to agriculture, primarily because it enjoys a disproportionate amount of the state's best agricultural soils. For example, Londonderry flax and linen enjoyed a world wide reputation in former years. Today, Londonderry apples appeal to visitors who come from throughout New England to “pick their own.” However, in the last forty years much of the key agricultural land in Londonderry has been converted to pavement and structures. The remainder of this chapter discusses a recommended natural environment program that addresses four broad topic areas:

- Protection of sensitive resources and water quality
- connectivity of our green infrastructure through a completed town-wide greenbelt or green matrix

- continued open space protection efforts
- continued protection of farms, agricultural soils, and agricultural land use

|| *Coordinate with the EPA's Phase 2 Storm Water Management Program*

Storm water runoff from development is one of the leading causes of water pollution and threats to drinking water quality. The recently established Phase 2 Storm Water program (EPA) sets new requirements for municipalities and developers to deal with the changes and problems in hydrology and water quality that result from non-point source water pollution (some of these problems include: habitat modification and loss, increased flooding, decreased aquatic biological diversity, and increased sedimentation and erosion). Londonderry should coordinate its water protection efforts with this program and utilize its resources wherever possible.

As the town works to meet the specific requirements of this program, a primary focus should be the identification of pollution sources in existing developed areas – particularly in and around the Manchester Airport, other industrial zones, and major aquifer areas, as well as residential sources of lawn chemicals and pet feces. The analysis should also result in the development of achievable mitigation measures. For more information on the requirements of the new Phase 2 Storm Water Management Program, please see the state's web site at www.des.state.nh.us/StormWater/

|| *Protect water quality and sensitive natural areas*

Londonderry's quality of life is closely tied to its ability to maintain a healthy natural environment and high quality drinking water. With a focus on protecting water quality for future generations, several key resources are targeted for conservation and protection. Broadly, these resources include:

- Aquifers and aquifer recharge areas
- Streams and floodplains
- Wetlands and hydric soils
- Steep slopes
- Wildlife habitats and corridors
- Productive agricultural and forest soils

The following section outlines a strategy for protecting these resources.

Recommendations are divided among four categories: education and outreach, acquisition of sensitive lands, effective zoning and land use planning, and the use of development practices that limit adverse impacts on natural resources.

|| *Conduct outreach and education to increase community awareness*

The Londonderry community can perhaps have the largest impact on maintenance and protection of drinking water. Unfortunately, some of the town's most important water resources have already been impacted by development. (e.g., aquifers built on, etc.). In these areas, new regulations limiting or regulating development cannot wholly address water protection needs. Rather, the town must reach out to existing landowners (in residential, industrial, and commercial areas) to increase awareness and understanding that each resident and business person is not only part of the Londonderry community, but part of the town's ecological community. As a first step, inform them on how day-to-day actions impact water quality and how they can help be a part of the Londonderry's water protection program. Just a few of the many steps individuals can take to contribute to water quality protection include:

- use pesticides and fertilizers sparingly or not at all and consider other alternatives for lawn and garden care
- perform regular septic system inspection and maintenance
- use vegetative buffers along drainage areas
- don't dump chemicals such as automobile fluids and petroleum products into storm drains
- compost yard waste
- conserve water and minimize lawn watering and irrigation

Getting started with outreach

New Hampshire Department of Environmental Services (DES) provides a grant program (Small Outreach and Education Grant Program) to fund outreach and education projects. For example, the Exeter River Local Advisory Committee used funding from this state program to increase landowner understanding of the impact their activities have on water quality, water quantity, and wildlife habitat. The project also includes a focus on informing these landowners of best management practices to protect buffers along watercourses and water bodies.

A short list of the type of projects and activities eligible for funding includes: development of educational materials, web site design, and establishment of demonstration sites. Londonderry should pursue funding through this program for development of outreach materials that educate about what not to do and what alternatives are available (For more information on this program please see: www.des.state.nh.us/wmb/was/smgrants.htm).

In addition to the DES program, Londonderry should access the programs and resources of the Rockingham Soil and Water Conservation District and University of New Hampshire Cooperative Extension.

Reducing development through the purchase of land and development rights

Protection through land purchase: In open areas where lands are not yet developed, protection could be accomplished through acquisition using the town's open space funding. In recent years, the town has been quite successful

protecting natural resources through purchase – some significant achievements include acquisition of lands in and around the Musquash Conservation Area, Kendall Pond Conservation Area, and the purchase of a conservation easement on the Ingersoll property.

Protection through the use of easements: Londonderry has also been successful in protecting resources through the use of easements. Easements are often popular because they offer the town and landowner more flexibility than outright purchase. For example, the land stays privately owned and on the tax rolls, the landowner maintains the right to utilize the land (uses will depend on the details of the easement restrictions), and protection will cost less than full acquisition. Easements can be established in a variety of ways including (but not limited to): negotiation during the development process (e.g., conservation subdivision), purchase using the town's open space

funding, or acquisition through a transfer of development rights (TDR) or amenity zoning program. This final technique (TDR/amenity zoning) is suggested for protection of sensitive lands along the western Route 102 thoroughfare (see Thoroughfares section, page 5 – 15). Note: more background and recommendations regarding Londonderry's open space planning and acquisition program are provided below (see: Open Space on page 4 – 22).



Ingersoll Property: This natural area was permanently protected through use of the town's open space protection funds.

Integrate smart development procedures into practice

In addition to specific sensitive resources, the areas surrounding these features present an additional water quality concern and opportunity. Development of any kind, even far from streams, wetlands, and other water resources, will have some type of impact on the environment and the water system. New structures and other impervious surfaces (e.g., driveways, parking lots) essentially reduce the ability for water to percolate through the ground, alter drainage flows and patterns, and typically consolidate pollutants and run-off into drainage basins and streams.

In contrast, smart development procedures that are promoted, incentivized, or regulated by the town, could significantly reduce the impact of new growth on water quality. Known as “low impact development,” this approach allows land to be developed with reduced infrastructure costs to the developer while simultaneously conserving and protecting the community’s natural resources. The technique applies to a variety of land development procedures including stormwater management, wastewater treatment, road circulation and design,

and overall site layout and planning. Some specific goals of LID include: protection of open space, incorporation of natural site elements into site design, decentralized stormwater management, alternative and site specific infrastructure specifications, and promotion of resource-based awareness.

The town should identify ways to integrate these concepts into common practice. For example, low impact development requirements could be added to the town’s regulations as an overlay district, amended to AR-1 district, or negotiated as an amenity in exchange for a development incentive (e.g.,



Low impact development – stormwater runoff from construction activities can have a significant impact on water quality so protecting a site during construction is critical

increased density in exchange for enhanced stormwater management using LID techniques). Nevertheless, to be successful the town must first establish support among the development community.



A bio-retention cell: Planted in low-lying areas, the gardens contain specific layers of soil, sand, and organic mulch. These layers naturally filter the site's runoff, substantially reducing common homeowner pollutants such as lawn fertilizers and driveway oils and providing protection for the receiving waterways. Source: Low Impact Development Center, Inc.

Highlight: Stormwater management using the Low Impact Development Concept

The overall goal of LID storm water treatment is to maintain to the extent possible or mimic pre-development conditions through the use of structural and non-structural practices that detain, retain, percolate and evaporate water (The Practice of Low Impact Development - US Dept. of HUD, July, 2003). Essentially, these treatment practices “decentralize” stormwater management facilities to reduce storm water quantity and treat it at the source (rather than downstream).

|| *Other tools to consider: environmentally-based zoning*

Within the town’s AR-1 district, the largest zoning district in Londonderry, density is calculated based on the soil’s ability to sustain the discharge from septic systems (in areas without public infrastructure). However, current zoning regulations do not fully reflect much of the town’s underlying environmental conditions or resources. Known as “environmentally based zoning” this technique would require the creation of new zoning districts or a series of overlay districts where density and land use is based on the environmental sensitivity of each area. For example, districts are often established based on watersheds and the “carrying capacity” of each sub-area in regards to the amount of development that could occur without resulting in adverse water quality impacts. In Londonderry, specific environmental and resource areas such as important aquifers or soils appropriate for agricultural use could serve as the basis for new districts or the refinement of existing districts.

|| *Minimize air, light, and noise pollution*

Londonderry should continue efforts to monitor and reduce air, light, and noise pollution from within and outside the municipality. In particular, the work of the Environmental Baseline Study Committee has been essential in gaining a better understanding of the impacts of development and change on the natural environment and should be continued.

The town is at the center of a fast-growing region that enjoys easy access to local mountains and vacation areas, the Boston metropolitan area, and beyond. This access and mobility is provided primarily by two major infrastructural resources – the Manchester Airport and Interstate 93 – both partially located within Londonderry. In addition, air pollution reaches Londonderry from far beyond the town’s border. Efforts to monitor and minimize air, light, and noise pollution should be coordinated and combined with surrounding municipalities and other regional interests.

|| *Connectivity, Complete Londonderry’s Greenbelt*

A healthy, functioning environment is a dynamic system of relationships and interconnections that can become disrupted by fragmented development. Islands of nature left surrounded by homes, roads, and development may not thrive as would a natural setting that maintains meaningful, functional connections. The town can help create a sustainable, diverse and integrated environment that contributes to high quality drinking water, habitat protection, and quality of life by planning for environmental and ecological connections such as wetland habitats, woodland habitats, and stream corridors.

To accomplish this goal, connections should be made between the anchors of Londonderry’s “green infrastructure.” These anchors are the major environmental areas of the town’s ecological system. By following sensitive resources such as streams and wetlands, the town-wide corridor system could provide a multi-fold benefit by protecting important natural features and

establishing a “greenbelt” that would provide a series of breaks from development. The greenbelt could also include a series of trails or pathways to encourage low-impact recreation along these corridors. Where possible, these connections should extend beyond the town’s borders and contribute to the region’s overall environmental health and sustainability. Nevertheless, the entire natural system should be seen as an integrated network of ecological resources, not solely a series of linear belts.

Conservation and Open Space

Conservation and open space efforts tie in closely with enhancement of the natural environment and drinking water. However, open space can serve a somewhat varied purpose and agenda as an essential component of livability and quality of life.

In Londonderry, open space includes the town’s large parks and preserves, apple orchards and agricultural lands, abandoned utility corridors (old Boston and Maine Railroad), the athletic fields, wooded residential areas, and the views along local country roads. Open space helps people to re-connect with nature and allows for quiet solitude or exhilarating sport and activity. Further, conservation lands often contribute financial benefits to nearby properties and can help maintain or reduce municipal budgets. In addition to providing these societal and financial benefits, open space is one of the strongest measures for the protection of the environment and the health of wildlife and natural systems.

Londonderry’s Open Space Efforts - summary

As the town has grown, so have its efforts to protect open space lands. For the most part, Londonderry’s open space protection began in the 1980s with the acquisition of 480 acres in the western part of town, making up the foundation of the Musquash Conservation Area. Today, other protected lands include sensitive environmental resources (e.g., wetlands), important views, agricultural

areas, natural resource and park areas, and lands used for recreation. In total, protected lands, shown in Map #7, account for approximately 9.5% of the total land area in Londonderry. (Note: this figure does not include properties owned by the town or school district unless there are development restrictions set forth in the property's deed).



Issues

This plan briefly documents some of the dramatic changes that have occurred in Londonderry over the past 40 years – 850 percent population increase, 550 percent increase in land used for residential purposes, and the creation and expansion of major commercial areas surrounding the Manchester Airport, I-93, and along state highways. This growth and development has drastically reduced the amount of undeveloped land in Londonderry. Between 1984 and 1996 almost 10,000 acres of open land (primarily woods and farmland) were converted to developed lands. Since that time, an additional 3,300 acres have been converted to residential, commercial, public, or transportation uses (source: 1997 Master Plan, and Londonderry Assessing Dept.). Furthermore, expansion of I-93 to eight lanes is likely to re-accelerate growth in Londonderry.

Protected open space – part of the Musquash Conservation Area

The loss of undeveloped land and its conversion to more intense land uses alters the character of the town, degrades the natural environment, increases storm water runoff, and impacts municipal budgets. However, Londonderry residents have expressed a strong desire to see open space protected and the character of the community maintained and celebrated. The following recommendations discuss some land protection opportunities the town can pursue to achieve these goals.

|| *Continue existing land protection efforts*

Londonderry should continue to protect important lands in town. A long-term goal or protection target should be established during future open space planning efforts.

|| *Update the open space plan*

Londonderry residents generally agree that the protection of open space and significant historical and cultural features is an important community goal. This is most obviously seen in their support for and approval of local open space funding measures (the Conservation Commission has received \$8.9 million in local appropriations toward implementation of the Open Space Protection Plan since 2002). These funds are utilized to implement the recommendations and concepts outlined in the town's open space plan which set out to identify lands worth protecting and to establish priorities.

Since establishment of that plan, many of the priority lands recommended for protection have been purchased or conserved through easement. Although a significant amount of work is yet to be done, the open space program has been well-received by the community and is considered a great success.

The town should take this time to return to the community and begin an update of the open space plan. This process should begin with a celebration of prior and ongoing successes such as the expansion of the Musquash Conservation Area, the protection of the Ingersoll property, and purchase of development rights on local orchards. The plan should also revisit open space priorities, not only priority lands, but priority uses. In addition to establishing lands threatened by development and environmentally sensitive resources, the process of the plan update should address: what is the community's vision for open space? Should open space be protected to promote rural character, should there be a focus of efforts based on environmental and water quality benefit? What is the long-term target for protection? Is there a desire to see a

town-wide trail network that links major conservation and park resources? Is there support for more neighborhood-scaled parks located throughout the town? Is there a need for a large athletic and sports areas and where should they be located?

Essentially, the effort should take a comprehensive look at the issues and needs of the environment and community and integrate a large spectrum of groups and organizations.

Other issues and concepts the plan update should consider:

- An updated protection strategy that includes incentives for land-owner participation (e.g., current use assessment, incentives for increased land conservation during development, etc.)
- A protection methodology that considers a variety of uses prior to acquisition or conservation and a consideration of various land resource interests (passive and active recreation, environmental conservation, rural character, and farmland protection)
- A long-term financing strategy that includes costs, benefits, source and use of funds
- A long-term stewardship process
- Recommendations for regulatory, incentive-based, and other non-acquisition methods for achieving open space goals
- Public access opportunities and ways to mitigate adverse impacts from recreational use

|| *Provide implementation assistance*

Londonderry's open space protection efforts are considered successful in large part due to the dedication and expertise of town volunteers. This community participation enabled the town to protect a significant amount of environmentally sensitive natural lands, working apple orchards, establish nature preserves, and protect water quality. While an updated open space plan

would establish clear implementation roles, tasks and schedules, there will be an increased need for professional assistance. Londonderry should provide the resources necessary to deal with ongoing land management such as landowner negotiations, baseline reporting, stewardship, and monitoring needs. This assistance could be in the form of full-time positions, consultants, or interns (for certain tasks).

|| *Consider a Conservation Subdivision Overlay*

It is unlikely that the town can protect all of its land and resources from growth, change, and development. However, the town can ensure that future development is consistent with the character of Londonderry through amendments or additions to the zoning ordinance. For example, required use of “Conservation Subdivision” techniques would guide development into areas of a site where there would be less impact on important resources such as orchards, historic sites and features, viewsheds, and sensitive environmental areas, as well as a consideration for the town-wide greenbelt. (Note: the conservation subdivision design would allow the same density as the underlying zoning district while allowing for farm activities to continue in another area).

Agriculture

Working agriculture serves a variety of town goals and objectives. For example, agricultural operations can contribute to open space protection, help maintain community character and the natural environment, and be part of a diverse economic base. In Londonderry, agriculture – apple orchards in particular – is a thriving testament to local history and the community’s desire to maintain the qualities that make the town a special place to be. Through the years, local farms have been the focus of a variety of local efforts to enhance and maintain the rural character of Londonderry. For example, Apple Way, designated in the late 1990s as a New Hampshire State Scenic and Cultural By-way, guides residents and visitors on a tour of some of Londonderry’s working apple orchards and other historical points of interest. Furthermore, working with landowners, the town helped enhance the viability of local farming and maintenance of rural character by purchasing conservation easements on several orchards in town (many of which are in and around the town center).

Agricultural Conservation Easements

Conservation easements are a particularly effective strategy for enhancing agriculture in fast-growing areas such as Londonderry. Essentially, this strategy puts cash in the hands of producers to be used for investment or business development and ensures the community that these lands will remain unencumbered by development.

According to the town’s tax parcel database there are approximately 142 parcels considered “agriculture, forestry, fishing and hunting” covering 12% (3,100 acres) of the total land in Londonderry. Of this acreage, only a small percentage is dedicated to active farming. These remaining farms, primarily apple orchards, represent a snapshot of the way life once was in Londonderry. One of Londonderry’s major agricultural products – growing flax and processing it into linen cloth – has all but disappeared and is only practiced as a remembrance to historical times (Both President Washington and President Jefferson wore shirts made from Londonderry linen).

In the Open Space Task Force’s plan, orchards and other agriculture areas were targeted for preservation in an effort to “sustain Londonderry’s rural heritage and improve the quality of life for all its citizens.” (Source: Open Space Plan, 2001).

Of course, the need for specific agricultural products is constantly changing and Londonderry's farmers will continue adapting to trends in the food industry, integrating new technologies, and working to be successful. However, farming in a fast-growing suburban community presents additional challenges. For



example, between 1962 and 1998 Londonderry lost 1,760 acres of farmland (65 percent reduction) while residential land increased by 6,200 acres (almost 550 percent).

During this time, the construction of I-93 increased the value of land in Londonderry to such a point that farming no longer made economical sense. In recent years, population growth has slowed and Londonderry's open space protection program has helped preserve many of the town's working farms. However, many agricultural lands

are still threatened by development and could conceivably be converted to alternative uses such as residential subdivisions (underlying zoning in agricultural areas is AR-1 which typically results in 1.5 to 2 acre lots).

|| *Continue to protect working agriculture from development*

Agriculture is an important component of Londonderry's history and rural character. As such, the protection of working agricultural operations has been a



One of the many apple trees in Londonderry

long-term town goal for several years. The town's efforts to protect these areas should continue and be an essential component of the aforementioned Open Space Plan Update. Particular focus should be given to those agricultural operations in areas under significant growth pressures.

The town should also consider establishment of a transfer of development rights or amenity zoning program (as discussed in Thoroughfares, Page 5 - 15) to cover the

costs associated with land protection through development in targeted growth areas.

|| *Enhance the viability of local agriculture*

Even on protected farmland there is no guarantee that the land will always remain as active agriculture and it is well beyond the town's scope and ability to impact global agricultural economics. What Londonderry can do is continue efforts to reduce development pressure and enhance the business environment for farming. Some ideas to consider are listed below:

Reducing development pressure:

- Purchase development rights
- Limit infrastructure improvements in agricultural areas (sewer and water will make agricultural land even more “development ready” and increase the pressure to convert farmland to alternative uses)
- Use zoning to guide growth to appropriate areas (away from farms)

Enhancing the business environment

- Support farmers and enabling legislation regarding state tax issues that directly impact their operations (e.g., allowing tax credits for working agriculture, reduced assessments for farm structures)
- Establish a buy local program
- Include opportunities for agricultural expansion in future economic development initiatives (see action plan recommendation in the economic development chapter, page 5 – 18)
- Support the town's tree farm infrastructure by protecting local tree farms and the saw mill with conservation easements

- Build off of previous successes in generating agriculture-related tourism such as Apple Way and identify new opportunities such as farmers' markets and other farm-related events (consider use of the town common)

|| *Encourage the use of best management practices*

Londonderry's farms are a wonderful asset and source of community pride and enjoyment. However, farming practices can have an adverse impact on the environment – typically in the form of polluted runoff. While the predominance of farms in Londonderry are considered “low-impact,” farms should be encouraged to participate in all state and county-sponsored programs to develop environmental management plans and implement best management practices (environmental management plans would include recommendations for soil erosion control, animal waste management, plant nutrient management, and chemical and pesticide management).

To encourage participation in environmental management programs, Londonderry could develop an incentive program that rewards farmers for proactively addressing environmental issues. Incentives could include full cost-sharing for development of management plans and recognition of success through awards or special designations.