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Low Budget Planning for Natural Resources and Open Space Conservation in Whitingham, Vermont

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LOW BUDGET PLANNING FOR NATURAL RESOURCES AND OPEN SPACE CONSERVATION IN WHITINGHAM, VERMONT

A Masters Project Presented

by

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ABSTRACT

LOW BUDGET PLANNING FOR NATURAL RESOURCES AND OPEN SPACE CONSERVATION IN WHITINGHAM, VERMONT

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This master's project was created for the Town of Whitingham, Vermont for the purpose of guiding town planning strategies with regard to open space and natural resources. It responds to Whitingham's draft town plan created in 2010 with the assistance of the Windham Regional Commission and was originally presented to the town planning Commission in May of 2010.

Whitingham is a rural community of 1,300 residents located near the Massachusetts border. Although Whitingham's population has grown slowly over the last twenty years, it has seen a significant increase in subdivision and housing construction, particularly vacation homes. Loss of the town's rural character and changes to its open space and natural resources due to development pressures were described by town residents as one of the most pressing concerns in Whitingham's 2010 draft town plan.

This project describes the local and regional setting of Whitingham, Vermont and examines the challenges and opportunities the town must work with in order to create and implement successful long term open space and natural resources planning. In particular, this project was designed to simplify and make palatable what could otherwise seem to be a complex and daunting planning and implementation strategy. It suggests a variety of low-budget and easy to implement options aimed at the long term conservation of the town's rural character, natural resources, and open space resources.

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INTRODUCTION

This project examines existing conditions and likely future trends relating to open space and natural resources planning in the town of Whitingham, a rural community of 1,300 residents located in the southern Green Mountains region of Vermont, and suggests a range of low budget and locally sensitive management options that maximize the devolution of land use control to the local community. As the town is currently revising its master plan and subsequently its regulatory bylaws, such a project is timely and useful. In light of the recent global economic crisis and its likely impacts on communities in Vermont, such low budget, locally implemented planning strategies may become increasingly relevant.

At the time of this project the town, with the assistance of the county regional planning agency Windham Regional Commission (WRC) had created a draft town plan. The draft town plan was the result of an in-person community visioning process supplemented with physical and electronic (on-line) surveys. These devices resulted in the adoption of the following goals recorded in the draft town plan. The goals that are most closely associated with this project are underlined below. Additional goals will be touched on to the degree that they relate to open space and natural resources:

1. To assure that basic needs of public health and safety are met and maintained.
2. To encourage a sound economy to meet the needs of the Town's residents.
3. <u>To provide adequate community facilities and services to the citizens and visitors of Whitingham.</u>
4. <u>To maintain the Town's characteristic pattern of settlement typified by villages within a rural setting.</u>
5. To encourage affordable housing opportunities for Whitingham residents.
6. To provide a superior, comprehensive education for all students.
7. To improve Whitingham's road and transportation system in order to promote safety and facilitate the flow of traffic.
8. To encourage energy conservation and the use of renewable, alternative sources of energy.

9. To protect lake shores, stream banks, and other significant natural areas and locations of special educational, scientific, historical, architectural, archaeological, or scenic significance.
10. To encourage the continued use of lands for agriculture and forestry.
11. To encourage compatible development activity that will best serve public and private interests.
12. To cooperate with all surrounding towns in the Windham Region to ensure mutual provision of basic needs and a sound economy.

(Whitingham, 2010).

The draft town plan is divided into sections (in a format mandated by the State of Vermont): *Community Facilities and Services, Transportation, Natural Resources, Land Use, Housing, Economic Development*, and *Energy*. Each of these sections also has a list of associated goals (described later), to which this project is responsive.

PROJECT DELIVERABLES AND ORGANIZATION

In general, this project was intended as a pre-planning tool to be used as the town updates and assembles its planning initiatives and bylaws in the years to come. The first part of this project describes the current condition of open space and natural resources in the town and in regional context, and it projects likely future outcomes of existing trends. The second part of this project describes various strategies that the town can use to control trends and outcomes and generally conserve, improve, and sustain the quality (and increase the quantity and distribution) of its open space and natural resources as defined by goals outlined in the draft town plan. These "interventions" are bundled into small complementary "packages" which can be implemented in whole or in part. Each package relates to a particular challenge (for example, creating subdivision bylaws, creating a conservation commission, etc.) to which the various "interventions" can be applied. In general, interventions are organized by the relative degree of implementation challenge, with the interventions that are easiest to implement listed first. Some interventions appear in multiple packages.

This project was designed to simplify and make palatable what could otherwise seem to be a complex and daunting planning and implementation strategy. Because each intervention is designed to stand alone, it can be removed from the whole, grasped and successfully implemented by the requisite human element: planning commission, conservation commission, neighborhood committee, etc. Furthermore, the organizational structure of this project is sympathetic to limitations in financial and human capital in Whitingham that could restrict the successful creation and application of complex and highly organized strategic planning scenarios. In a nutshell, collections of single interventions may be easier to swallow—financially, politically, and administratively. These individual strategies can be implemented over time as

resources and political will become available. They can also easily be incorporated into larger planning strategies—for instance a future town open space plan. The successful early implementation of a few simple strategies may provide the town with the will to move forward and apply even more challenging strategies down the road. As the interventions are listed in order of difficulty, the "next steps" are the next interventions on the list. Finally, it was recognized that progressive, highly organized plans are easier to create than to implement. The implementation of a large complex plan may fail due to a lack of resources or will, an inability to implement key structural elements essential to the success of the plan as a whole, or may fail when the plan loses relevance over time. The failure, in part or in whole, of complex but hopeful planning strategies can be depressing to witness. By contrast, the interventions in this project are less subject to the decay of the whole. Although they are designed to be complementary, they can succeed individually, be implemented individually, and be modified individually. The failure of any one intervention is less likely to limit the viability of the rest. Progress, then, is not dependent upon the outcome of a comprehensive whole but rather on the dynamism of a collection of interactive efforts (Sargent et al., 1991; Stokes & Mastran, 1997; Daniels et.al. 2007).

A layman's version of the product described above was delivered to the town in May of 2010. It is expanded and elaborated on here, but remains organizationally the same. I have prefaced it with information on the planning, regulatory, and conservation environment of Vermont.

CHAPTER 1

A BRIEF PORTRAIT OF WHITINGHAM, VERMONT

1.1 Location and Physical Geography

The town of Whitingham, 25,046 acres in size, is located in southern Windham County, Vermont just east of the crest of the Green Mountains and contained within the Deerfield River Basin (part of the larger Connecticut River Watershed). Whitingham is a rural bi-nucleated town with two small village centers—Jacksonville and Whitingham. To the south, Whitingham abuts the rural Massachusetts hilltowns of Rowe, Health, and Colrain. In Vermont it abuts the town of Readsboro (west), Wilmington (north), Marlboro (northeast), and Halifax (east). The nearest urban center is Brattleboro, Vermont located 25 miles (40 minutes) to the east. The next closest urban centers are Bennington, Vermont (30 miles, 42 minutes west) and Greenfield, Massachusetts (30 miles, 48 minutes southeast). The closet limited exit interstate is I-91 at Brattleboro. Major routes in town include Vermont State Route 100 (the town's widest and highest volume road), State Route 116, and an extension of a Massachusetts Route 8A. The town contains 31 miles of gravel roads and 40 miles of paved road (Whitingham, 2010). Refer to Maps 1 and 2.

The topography of Whitingham could be described as hilly to mountainous; elevations range from 1,100 to 2,300 feet. Although all of the town's rolling peaks and hills are wooded to their summits, steep valleys cut by the Deerfield River, Brown Brook, and the east branch of the North River provide the town with dramatic topography. Steep slopes greater than 15% account for 27% of all land in the town (refer to Map 3). The town's hilliness has influenced the concentration of road building and development along riparian basins. Forests, predominantly the northern hardwood forest types, cover 80% of the town (20,000 acres) and agricultural

fields 10%. An undetermined amount of forestry (practices vary) takes place in Whitingham's forests. Maple sugaring is especially important. Forest types in Whitingham are predominantly of the "northern forest" variety dominated by maple, ash, birch, hemlock and spruce. Farms are scattered throughout town, most of them located in the central and eastern sections of Whitingham. Farm fields tend to run parallel to abutting roads (Whitingham, 2010). Over 13% of the town, 3,172 acres, contains soils that are highly suitable for agriculture. Eight-hundred and sixty-five of these quality soils acres are currently in farming; the rest are either wooded or have been converted to residential use. Almost all of the areas containing quality soils are near existing roads. A total of 82 acres of farmland (exclusive of the non-agricultural portions of farmsteads) has been permanently protected while 303 acres of land with quality soils have been protected (Whitingham, 2010; Windham Regional Commission, 2009b). Refer to maps 4 through 6.

In addition to the riparian areas previously mentioned, the town has several other important hydrologic features. Most prominent are Harriman Reservoir, (eight miles long, 1,950 acres, thirty-eight billion gallons of water) shared with the town of Wilmington, and Sherman Reservoir (166 acres), shared with Readsboro and Rowe. Both are hydroelectric impoundments on the Deerfield River and are owned and managed by Trans Canada, an electric utility company. Also prominent is Sadawga Lake (190 acres), a shallow raised-level lake located near Whitingham village center and known for its floating bog island. Finally, the town contains several smaller ponds between twelve and thirty acres in size: North Pond, Shippee Pond, Clara Lake, Ryder Pond, Laurel Lake, and Jacksonville Pond, as well as over 700 acres of scattered wetlands. Floodplain is scant in town; what little there is can be found south of Jacksonville village along a two-mile stretch of the North River (seventy-one acres) on the Route 116 corridor on uninhabited conservation land near the Deerfield River (Whitingham, 2010; Federal

Emergency Management Agency, 2008). Map 7 shows the water resources mentioned above, in addition to the town's waste water management zone, general vicinity of sewer service, state designated Surface Water Protection Areas (SPA), and (in abutting Massachusetts only) state designated Outstanding Resource Waters. These latter two designations apply to hydrologic regions that have been recognized as valuable in terms of drinking water, habitat, flood control, and other features (Massachusetts Department of Environmental Protection, 2010; Vermont Agency of Natural Resources, 2009).

Trans Canada owns 4,502 acres in Whitingham surrounding the Harriman and Sherman reservoirs and the Deerfield River, to which the Vermont Land Trust (VLT) holds a permanent conservation easement. Combined with the abutting eight-hundred acre state-owned Atherton Meadows Wildlife Management Area, the west one-quarter of town is largely composed of protected conservation land. VLT also holds easements on mixed farmland and working forest elsewhere in town, totaling 475 acres in three distinct aggregations. Town-owned open space areas are less significant: the largest are Town Hill Park, six acres, and the combined town school, transfer station and highway department property, twenty-seven acres (Whitingham, 2010; University of Vermont, 2009). Refer to Map 8.

1.2 The Human Landscape of Whitingham

Whitingham was chartered in 1770. It has two equally small village centers: Whitingham (fifty buildings, more or less) located in the west side of town on Route 100; and the slightly larger Jacksonville (seventy-five buildings) on the east side of town at the junction of Route 116 and 100. The architecture and character of both villages are distinctly "small town New England" in appearance. The village centers contain over twelve historic buildings and sites on the national or state register. Highlights include the birthplace of Latter Day Saints patriarch

Brigham Young, Green Mountain Hall, Number 9 Schoolhouse, and the Whitingham General Store. Other historic places are scattered throughout rural areas in town and include thirteen small cemeteries, several historic homes and farms, and the Glory Hole, a unique circular 160 foot spillway drain at Harriman Reservoir shaped like a morning glory flower. Commercial activity in town is limited to thirty or so small businesses, most of them concentrated in the village centers. Industry is also small scale and includes auto repair, a fine furniture manufacturer, sawmill, and a winery. The town offices are located in Jacksonville. The rest of the town is rural in character with the remaining residential development largely dispersed along longstanding town roads (Whitingham, 2010).

Table 1: Housing Stock

				% change	**% change**
Unit type	**1980**	**1990**	**2000**	**1980-1990**	**1990-2000**
Seasonal	20	271	259	1255	-4
Owner Occupied	304	357	427	17	20
Renter Occupied	81	81	88	0	9
Vacant	177	28	28	-84	0
total units	582	737	802	27	9

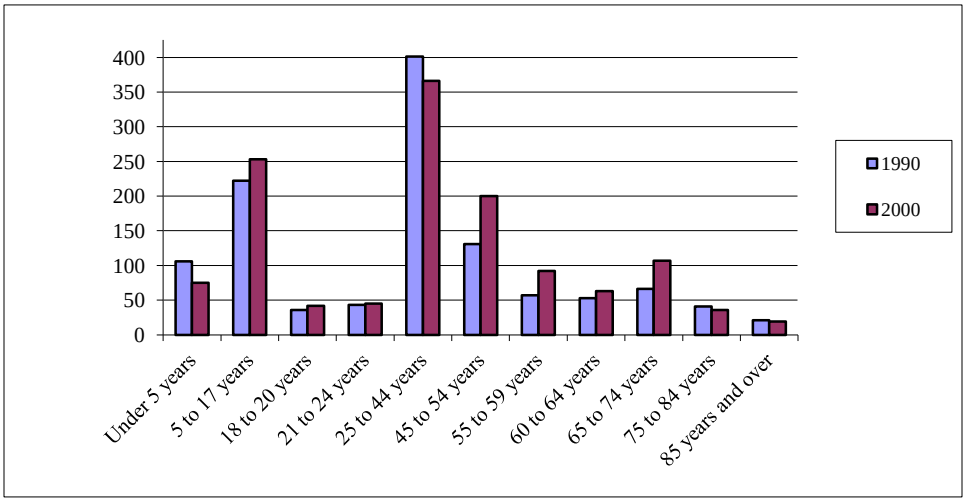
Source: U.S. Census 2010 as qtd. in Whitingham, 2010.

The most recent land conversion in Whitingham has occurred along existing roads, especially in the north of town along the Wilmington border and in the south along the Heath border. Housing stock in town is two-thirds single family owner-occupied. One third of homes in town are single family homes belonging to owners with out of state addresses (Whitingham,

2010; Windham Regional Commission, 2010). Many of these homes are undoubtedly vacation or retirement homes, a sector which saw a dramatic surge (1,200%) in growth between 1980 and 1990 in Whitingham concurrent with the expansion of ski resorts to the north and south. Although some recently developed parts of town are beginning to take on a large-lot suburban feel, it would be difficult to characterize any neighborhood in Whitingham as definitively suburban (Whitingham, 2010).

Table 2 shows population age distribution in town, with the most dominant element the 25-44 age range. In Whitingham, population density is low and geographically dispersed. Ten-year population growth rates between 1990 and 2000 were at 10%; forecasts for the twenty years 2010-2030 predict an 8% increase per decade. Population figures and forecasts do not take into account the seasonal flux of second home and retirement home occupation, however (Whitingham, 2010).

Table 2: Town of Whitingham Age Distribution



Source: 2000 U.S. Census as qtd. in Whitingham, 2010

Employment statistics show that 33% of employed town residents work locally. An additional 21% work in nearby Wilmington while the remainder work further away with at least 25% as far away or farther away than Brattleboro. According to the 2000 U.S Census, Whitingham's median household income was $37,434, the median family income $48,000, and the percentage of the population below the poverty level was 8% (Whitingham, 2010; United States Census 2000).

Public facilities in town include the town hall and offices in Jacksonville, two fire stations, a volunteer ambulance service, town garage, school, library, transfer station, and two small wastewater treatment plants, one located in each village center. As of 2007 each of these plants were receiving only 50% of their total capacity and were considered sound. Pre-school through middle school children attend school in Whitingham; the regional high school is located in nearby Wilmington. Recreational resources in town include playgrounds and athletic fields at Town Hill Park, a basketball court at the town hall, and boat ramps at Sadawga Pond and Harriman Reservoir. Harriman Dam is also accessible to the public and a picnic area and car top boat launch are located to the east of it. Two local snowmobile clubs maintain an extensive network of routes than span the entire town and connect to routes in abutting towns, while the Catamount Trail , a cross-county ski trail spanning the vertical length of Vermont, begins in southwest Whitingham and runs north into Wilmington along the east side of Sherman Reservoir and the west side of Harriman Reservoir. Hunting and fishing, traditional past-times, are enjoyed throughout the town on public land, VLT easements on Trans Canada land, and private land through landowner permissiveness. The town has no official hiking trails, although it does have several stretches of class 6 and other abandoned roads, some of which are passable. Some segments of the Catamount Trail are also passable on foot but may be wet, erosion prone, or overgrown by herbaceous vegetation during warmer months, making it

unsuitable for hiking. Whitingham has no official swimming area (Whitingham, 2010; Catamount Trail Association, 2007). Refer to Map 9.

1.3 Regional Context

The major east-west travel and tourism routes near Whitingham are "The Molly Stark Highway" Vermont Route 9 (Brattleboro to Bennington) and "The Mohawk Trail" Massachusetts Route 2 (Boston to Williamstown). Both of these routes have been improved and widened to facilitate east to west commercial and commuter travel and are well known tourism routes. The most prominent north-south corridor in the area is the limited access federal highway I-91, which spans New England through the Connecticut River Valley. This is the primary access route to eastern Vermont and Western New Hampshire for visitors arriving from points south. To the west, Route 7 through the Valley of Vermont (Bennington to Burlington) is the second most important north-south travel corridor in the state. Although too winding to serve as major commercial and commuter routes, Route 116 and Route 100 are attractive alternative routes from the lower Connecticut River Valley and the Berkshire East ski area in Charlemont to the Stratton and Mount Snow ski areas in southeastern Vermont, especially for those interested in avoiding traffic in Brattleboro. There is anecdotal evidence from town residents that suggests that the town is beginning to be used as such a "cut-through" route (Whitingham, 2010). Research has shown that proximity to ski areas tends to increase the value of undeveloped land in Vermont (Turner, Newton, & Dennis, 1991). Whitingham's distance from Wilmington and Charlemont and the corresponding lower price per acre for land in town may be appealing to potential buyers who cannot afford to buy vacation homes closer to the ski areas.

Whitingham is located within a vast interconnected area of undeveloped natural habitat characterized by relatively unbroken forest cover. Most prominent is the 400,000 acre Green

Mountain National Forest (GMNF) which runs the spine of southern and central Vermont. Adjacent non-profit and state owned conservation land in Vermont and Massachusetts combined with the GMNF compose a vast swath of relatively contiguous conservation land, varying in width, from northwest Massachusetts to the Canadian border and from Bennington through western Whitingham via Trans Canada land eased to VLT. This protected mass also includes much of the Deerfield River basin, especially in Vermont, although the river is impacted by impoundments. The western one-fourth of Whitingham is within the GMNF "proclamation boundary" and can be purchased and annexed to the GMNF by the United States Forest Service if the federal government is interested and the town concedes to the acquisition. The aggregate corridor of protected lands to which the GMNF is the core is surrounded by a larger area of undeveloped private forestland extending all the way from northwest Connecticut north into Quebec, and from eastern Bennington through Whitingham to western Brattleboro. East to west protected conservation corridors are less evident in Whitingham and southeast Vermont in general (Whitingham, 2010; Foster et al., 2010). Refer to maps 2, 10, and 11.

CHAPTER 2

THE VERMONT PLANNING AND REGULATORY ENVIRONMENT

In order to understand the limitations and possibilities for open space and natural resource planning in Whitingham, it is necessary to take into account the legislative and regulatory environment particular to Vermont. These factors are described below.

2.1 State planning enablement and local legislative, quasi-judicial, administrative, and advisory structures

Like the rest of New England, Vermont is a "home rule" state. Under home rule, the responsibility for creating municipal plans, zoning, and subdivision are devolved to the community through enabling legislation at the state level. A *planning commission* of three to nine members is appointed by the municipal legislative body or is elected and is empowered to conduct "capacity studies and make recommendations on matters of land development, urban renewal, transportation, economic and social development, urban beautification and design improvements, historic and scenic preservation, the conservation of energy and the development of renewable energy resources, and wetland protection" (Austin et al., 2004, p. 117). Thus a town planning commission is empowered with the legislative task of crafting master plans, bylaws, and other regulatory structures which town voters or town legislative body must then either approve or disapprove. Furthermore, the planning commission may also be responsible for the quasi-judicial review and approval of subdivision and site plans (Vermont Statutes 24 V.S.A. § 4323, § 4325, & § 4381; Smart Growth Vermont, 2011). Although town zoning, subdivision, and other bylaws are required by state law to conform to a town's master

plan, some of Vermont's small rural towns still do not have zoning, subdivision, or master plans (Austin et al., 2004).

Quasi-judicial zoning appeals, conditional use permits, and variances may be handled by either a *development review board* or a *board of adjustment* (also called a *zoning board of appeals*), but a town may not have both. In rural towns it is permissible for members of the Planning Commission to be on either of these boards and in very small towns the planning commission may carry the functions of a board of adjustment. Boards of adjustment consist of 3-9 members and development review boards 5-9 members. Where a town opts to have a development review board, that board also takes on the quasi-judicial responsibility of reviewing subdivision permits and site plans, thereby restricting the planning commission to legislative functions. Towns may also appoint an *administrative officer* to interpret town bylaws, issue permits or refer permits to appropriate town boards. (Vermont Statutes 24 V.S.A. § 4460 & § 4448; Smart Growth Vermont, 2011).

Unlike neighboring Massachusetts, town *conservation commissions* in Vermont lack the quasi-judicial authority to directly review, grant, or deny any part of a plan or permit, although they may provide critical information affecting the approval or disapproval of permits or plans to the town planning Commission or other board. They function in more of an advisory capacity and also take on special conservation related projects approved by the town. Most importantly they advise the planning commission and town legislative body about natural resources issues. conservation commissions are composed of three to nine members appointed by the town select board. Other advisory boards may be created by a town as needs arise (Vermont Statutes 24 V.S.A. § 4433).

2.2 Regional Planning Commissions and Regional Plans

Regional planning commissions are also enabled by state law and primarily provide planning advice and assistance to towns, engage in special projects on the regional scale, conduct research, and produce planning templates, technical documents and cartographic materials. They also create *regional plans* which in theory guide town planning efforts but in practice may not be closely reflected in town plans (Vermont Association of Planning and Development Agencies, 2011). As is commonly true in many communities, the implementation of such plans may be thwarted by lack of local capital, experience, will, timing, or by conflicting political ideals. According to state laws, where conflict between a regional plan and a municipal plan exists, the municipal plan supersedes the regional plan except in circumstances where the municipal plan is shown to have a regional impact (Vermont Statutes 24 V.S.A. § 4345a, § 4350, & § 4476). Regional planning commissions are also responsible for reviewing and approving municipal plans for the state. Each regional planning commission is composed of a representative from each municipality in the commission's administrative territory but regional planning commissions also hire non-representative paid professional staff. In Vermont, regional planning commissions are loosely tied to counties. Windham County of southeast Vermont (where Whitingham is located) is represented by the Windham Regional Commission (Vermont Statutes 24 V.S.A., § 4341, § 4343, § 4348, & § 4350).

2.3 State Legislation Affecting Land Use Planning In Vermont

<u>Act 60, Act 68, and the effect of conservation land on property taxes</u>

In response to the 1997 *Brigham v. State of Vermont* decision, where the Vermont Supreme Court ruled that the state violated the equal protection rights of children to receive equitable and adequate educational funding, the state legislature passed Act 60. In effect, Act

60 imposes a uniform statewide property tax ($1.36 in 2011; periodically adjusted). These taxes are collected by the state and are redistributed to towns at a per pupil return rate, regardless of the size of each town's contribution. Individual towns can build upon this foundation by voting to raise town property taxes beyond the base state rate of $1.36. These additional monies are also collected by the state which in turn redistributes them to those specific towns at $42 per pupil for each additional penny rate increase above the $1.36 base rate. Although towns with large tax bases can raise more than $42 per pupil with just a $.01 increase in tax rate, they are not allowed to keep this excess; rather it is pooled and redistributed across the state to fund education in towns with small tax bases (Act 68 subsequently modified this system; see below). Furthermore, Act 60 provides tax caps for property owners (single homesteads on 2 acres of land or less) at a rate of no more than 2% of Adjusted Gross Income (AGI) for households earning $75,000 or less (raised to $90,000 in 2007), and provides sliding scale rates for low-income households earning less than $47,000 AGI (Mathis, 1998; Vermont Property Publishing, Inc., 2010). In 2003, follow-up Act 68 introduced revisions to Act 60, including a split tax rate with a higher (fixed rate) of $1.59 for non-residential properties, the ability of towns to increase taxes to pay for capital educational expenses (school construction, for example), replacement of the over-spending pool with a graduated tax increase for towns which spend more per pupil than the state expends, and tax penalties for towns that engage in "excessive" educational spending. Under the latter provision towns which spend more than 135% of the state average are taxed at double the state rate (Vermont Department of Education; Chimbolo & Hammond, 2004).

Beside its effects on education reform, Act 60 and Act 68 have altered the way in which conservation land affects a town's property taxes. In states where property taxes are assessed, collected, and redistributed locally to fund local education, conservation land (exempt from

taxes or assessed at a reduced rate) can reduce a town's tax base. As the tax based is eroded by acreage increases to the town's conservation land inventory, some towns may be forced to contemplate raising property taxes to cover education costs. Alternately, they may be forced to make cuts in education. In Vermont the uniform property tax created by Act 60 significantly reduces the anxiety town residents may feel when presented with the opportunity to accept state, federal, or private conservation land in town. Likewise, the uniform property tax may also reduce the likelihood that towns will capitulate to less than desirable commercial and industrial development projects out of a need to increase their tax base in order to fund education. Although it may be that the Act 68 opt-out with regard to capital education costs dulls these effects somewhat, pre-Act 60 research conducted by the VLT suggests that conservation had only minor impacts on town tax bases (Brighton, 2009).

Other factors also limit the impact of conservation land on a town's tax base. Private conservation land in the form of conservation easements usually has a history of enrollment in the state's Use Value Assessment Program (UVAP, discussed later); tax rates for UVAP enrolled land are nearly identical to tax rates on conservation easements. The state also reimburses towns for revenues lost to land enrolled in the UVAP program. Furthermore, municipal taxes only make up between 20% and 30% of property tax burdens. Conservation land acquired by the state or federal government, on the other hand, is removed from the local tax base altogether, but the federal government, when acquiring land, contributes an annual per acre payment to the town *and* to the school district toward educational expenses ($2.34 and $1.07 in 2009). The state pays the town at a rate of 1% of the land's value for conservation land it owns. These payments reduce a town's yearly educational costs. Taking into account all of the factors just mentioned as well as the fact that conserved land demands less in municipal services than does developed land, conservation land tends to reduce, not raise, long term municipal taxes in

Vermont towns on the average. Studies conducted by VLT concur and show that commercial and residential development tend to raise municipal taxes while vacation property tends to lower municipal tax burdens—but only in towns that had a high proportion of vacation property *and* were still relatively rural. (Brighton, 2009)

Act 249 and Amendment S-27: Closing the "10-acre septic system loophole"

Until 2002, Vermont Act 249 allowed an exemption from state septic review requirements for residential lots 10 or more acres in size in towns with no local septic ordinance. This became the widely known and criticized "10-acre loophole." In order to take advantage of the loophole, developers subdivided land into so-called "spaghetti" or "bowling alley" shaped lots to maximize road frontage yield while keeping lot size above the ten-acre septic review threshold. The loophole, anathema of environmentalists, smart growth advocates, and progressive land use planners who argued that lots with such dimensions effectively fragmented ecosystems and created unwieldy land use patterns while supporting the proliferation of substandard septic systems, was closed in 2002 with the passage of amendment S-27 (iBerkshires.com, 2001; Glitman & Perkins 1999; Yakos 1999b). A state reviewed and approved septic system permit is now required for all development, must be designed by a licensed engineer, must conform to state design standards, and cannot be built on slopes of 20% or greater (General Assembly of Vermont, 2002). Nonetheless, the "bowling alley" lot legacy of Act 249 is apparent throughout Vermont predominantly in rural communities which lacked the planning acumen or political motivation to create local septic review bylaws or dynamic subdivision regulations. This kind of subdivision may impair future subdivision of the land by effectively cutting off back acres from legal roadways. It may also reduce the value of back acres to non-profit and government conservation buyers who are less likely to want to deal with "stringy" lots that cannot easily be aggregated with adjacent land into substantial blocks of

recreational open space or habitat area. Such lots may confound public access for traditional recreational activities such as hunting: when one bowling alley shaped lot is posted "no trespassing," the back acreage of other nearby lots can become inaccessible. Finally, bowling alley lots can increase the likelihood of habitat fragmentation when adjacent lot owners each practice differing land management regimes on the undeveloped portions of their narrow property strips.

The irony of the Act 249 loophole is particularly apparent when considering the Act 250 State Development Review, described below.

Act 250, Act 200 and State Development Review

Act 250, passed in 1970 (and its companion update Act 200) is a complex and widely reviewed law created in response to the rapid uncontrolled conversion of large undeveloped tracts of land into vacation resort development, but it is also seen as an effective check to sprawl in general. Act 250, in essence, requires the state to review and approve *all* development on ten or more acres of land and *all* housing development of 10 or more units constructed or maintained within a five mile radius (contiguous or non-contiguous) on land owned or managed by the same entity. It also mandates review and approval for any development occurring over 2,500 feet in elevation, any construction by state or local government on ten or more acres of land, any road-building that serves five or more units, subdivision of any land into ten or more lots, and substantial changes to existing developments. Furthermore, in towns that lack a state approved zoning *and* subdivision ordinance, Act 250 requires the state to review *all* development on land parcels over one acre in size. Until 1987, Act 250 exempted from review subdivision of land into lots of ten acres in size (its own "ten acre loophole"), resulting in problems similar to those created by the Act 249 septic system loophole. This loophole persisted independently until 2002 (Vermont Statutes, 10 V.S.A. Chapter 151; Sanford & Stroud,

1997; Yakos & Wilhelm, 1999b; Vermont Natural Resources Board, 2006b; Kraichnan, 2008; Vermont Department of Housing and Community Affairs, n.d.).

When imposed, Act 250 compels the state to consider ten base criteria when reviewing development plans. It mandates that development. . .

1. Will not result in undue water pollution or air pollution.
2. Will have a sufficient water supply.
3. Will not cause an unreasonable burden on an existing water supply.
4. Will not cause unreasonable soil erosion or runoff.
5. Will not cause unreasonable traffic congestion.
6. Will not cause an unreasonable burden on educational services.
7. Will not cause an unreasonable burden on other municipal services.
8. Will not have an undue adverse effect on scenic beauty, aesthetics, historic sites, or rare and irreplaceable natural areas; and will not destroy necessary wildlife habitat or any endangered species.
9. Will conform to the capability and development plan, including, for instance, limiting development on primary agricultural soils, using the best available technology for energy efficiency, and using cluster planning in rural growth areas.
10. Will conform to local and regional plans or capital programs.

(Vermont Natural Resources Board, 2006a)

Permits are reviewed by one of nine Regional District Commissions (RDCs) created for the purpose of Act 250 review. Each RDC is composed of three members of the local region appointed by the governor; they need not be land-use professionals. Both town legislative bodies *and* town planning commissions are regarded as statutory parties; they may demand an Act 250 review and may challenge any permit submission based on any of Act 250's ten criterion. Requirement #10 in particular empowers communities with the ability to force development to conform to adopted master plans and local regulations; thus a town plan may have a regulatory effect under Act 250 review. However, even if the town has no zoning, subdivision, or master plan it may still challenge the permit via any of the other nine criteria. Property owners affected by the proposed construction may also be regarded statutory parties in an Act 250 review process. The RDC can exempt "minor applications" from the public hearing

process (Dafoe,1992; Sanford and Stroud, 1997; Vermont Natural Resources Board, 2006a, 2006b; Kraichnan, 2008).

Act 250 public hearings must be scheduled within twenty-five days of receipt of a permit submission and held within forty days. Most permits (95%) are granted albeit with modifications requiring greater conformity to one or more of the ten criteria; 75% (2009 figures) are considered minor and are granted without a public hearing. The average processing time of a permit was, in 2009, forty-one days. Granted permits expire after three years. Effective in 2005, appeals were processed by a nine-member state Natural Resources Board, also appointed by the governor.

Act 250, while not lacking criticism, has been widely lauded for significantly helping to protect the state's environmental resources, quality of life, and aesthetic character without significantly discouraging development. Although some of the flaws in Act 250 such as the ten acre loophole and lack of a formal appeals board have been worked out in subsequent amendments, one of the most widely noted remaining flaws in the legislation is the difficulty of enforcement: projects that should trigger an Act 250 review are sometimes overlooked or go unchallenged at hearings. Where Act 250 permits are granted, subsequent construction may not be adequately reviewed for compliance (Dafoe,1992; Sanford and Stroud, 1997; Vining & Kehler, 1999; Vermont Natural Resources Board, 2006a, 2006b; Kraichnan, 2008; Vermont Department of Housing and Community Affairs, n.d.).

Use Value Appraisal Program

Vermont's Use Value Appraisal or "Current Use" program taxes qualifying working forest land and farmland according to the value of its commercial use as apposed to its "highest and best use" (development value). Qualifying farmland must be 25 acres in size or larger, actively used for farming purposes, and financially productive. Smaller parcels of farmland may qualify if

they are being leased by a farmer or if they generate $2,000 or more in gross agricultural sales annually. Non-agricultural portions of the property do not qualify, but forests used for maple sugaring may be enrolled. Qualifying forest land must be 25 acres in size or larger and must be managed under a state-approved forestry plan. The land must be used for harvesting timber to qualify; it may not remain wooded but idle. Land areas used for purposes other than forestry are excluded (Vermont Department of Forests, Parks and Recreation, Forestry Division, County Forester Program, 2010).

The state retains the right to monitor land enrolled in Current Use. Land enrolled in these programs is subject to a lien which runs with the land. If the land is developed while enrolled in the program the land owner must pay a change of use penalty. If a landowner withdraws from the program the change of use lien follows the land and applies to any future development at a rate calculated based on the date of withdrawal. The average "break even" point at which the land use change tax is surpassed by total tax savings in sixteen years. Proceeds from the land use change tax are distributed to Vermont communities (Vermont Department of Forests, Parks and Recreation, Forestry Division, County Forester Program, 2010; Vermont Department of Taxes, 2009).

The UVAP has been quite successful; as of 2000 over 30% of eligible forest land and over 50% of eligible farmland was enrolled in the program—over 27%% of the land area of the state of Vermont. In the 2000s, net enrollment in the program was increasing at about 4% each year with only a 1% withdrawal rate (Daniels, 2002).

Water and wetlands regulations

In addition to the water and wetland protections provided through the Clean Water Act and other federal regulations, the *Vermont Wetlands Rules* affect development and disturbance of natural systems and open space around water resources. According to the Wetlands Rules,

almost all of the water resources mapped on the United States Geological Survey's National Wetlands Inventory (NWI) and all water resources contiguous with NWI mapped resources are regarded as "Class II" wetlands unless designated by the state as "Class I." Class I wetlands are those wetlands that the Vermont Natural Resources Board (VNRB) determines are "exceptional or irreplaceable in their contribution to Vermont's natural heritage and merit the highest level of protection." Both Class I and Class II resources are considered "significant" by the state of Vermont and are offered protections above and beyond federal regulations. A third category, "Class III" wetlands, are not considered "significant" but may still be protected under federal regulations. Class III wetlands typically include very small or obscure water bodies or riparian areas (often artificial) that have not been mapped in the National Wetlands Inventory but have not been designated "Class I" by the state. Of the three, Class II wetlands areas make up the vast majority of water resources in the state. Class II wetlands may be re-designated as Class I wetlands by the VRWB upon motion by local communities, organizations, or state agencies, and findings of significance in relation to flood control and storm water management, surface and ground water protection, erosion control, wildlife and fisheries habitat, plant habitat, threatened or endangered species habitat, or if the wetland has significant educational, scientific, recreational, historic, economic, or aesthetic value (Vermont Natural Resources Board, 2010).

Under state law, Class I wetlands are protected by a 100 foot buffer and Class II wetlands by a 50 foot buffer. Construction and similar disturbance within these buffers is restricted or prohibited altogether, subject to special permit or appeal (Vermont Natural Resources Board, 2010). Whitingham does not have any Class I or Class III designated water resources (Whitingham, 2010).

The Vermont Department of Environmental Conservation (VDEC) is responsible for permitting of construction which impacts storm water discharge and flow. Construction actions which disturb more than one acre of land require the *Construction Stormwater Permit*. Industrial development of any size requires the *Multi-Sector General Permit*. The *State Stormwater Permit* is generally required for any construction with more than five-hundred square feet of impervious surfaces. State prescribed stormwater management best management practices (BMPs) apply as a condition of these permits. Stricter standards (often expressed in terms of Total Maximum Daily Load allowed) are required for "impaired waters"—those waters that are already judged below Vermont water quality standards. One-hundred foot minimum no-disturbance buffers are applied to impaired waters. The only impaired water in Whitingham is the Deerfield River and its reservoirs, much of which is already within a larger block of conservation land (Vermont Agency of Natural Resources, 2011). All of aforementioned permits are mandated by the state with multiple permits applying in some cases. Separate regulations apply to agricultural and forestry operations that result in discharge, generally expressed in terms of regulations in conjunction with required BMPs (Vermont Department of Environmental Conservation, Water Quality Division, 2005, 2008; Vermont Agency of Natural Resources, 2002a, 2002b).

Finally, the construction of boating docks is regulated by the state. Concrete and stone docks and generally prohibited; other docks may require a state permit (Vermont Statutes 24 V.S.A.).

State Highway Access Permits

Under state law, any work within a state highway right of way, including a driveway or subdivision curb cut, requires a highway access permit. The Vermont Agency of Transportation reviews such access permits and may deny one if it finds that the prospective construction is

inconsistent with town planning goals, especially with regard to the protection of natural resources (Austin et al. , 2004).

2.4 Initiatives, Funding, and Non-Governmental Resources

A number of land trusts are active within Vermont and work with local communities with the goal of conserving natural resources and open space. Among these, the VLT is only the conservation non-profit active in the Whitingham area. VLT works throughout Vermont with the nearest regional office in Brattleboro. Throughout the state, VLT's efforts have been directed at agricultural land and more recently forested land. VLT is a purchaser of conservation easements throughout the state (Vermont Land Trust, n.d.).

Other non-profit or quasi-public sources of funding include the Vermont Housing and Conservation Board which offers grants and other land acquisition initiatives for the purchase of conservation land and easements (Vermont Housing and Conservation Board, conservation programs, n.d.). Regionally, the Deerfield River Watershed Association (DRWA) and the Catamount Trail Association (CTA) are engaged in resource protection, access, and land protection with regard to the Catamount Trail and Deerfield River. CTA holds trail easements with TransCanada and VLT (Catamount Trail Association, 2007; Deerfield River Watershed Association, 2011). Directly to the south in Massachusetts, the Franklin Land Trust is active in protecting land in Massachusetts towns that abut Whitingham; they recently participated in a broad-based landmark effort to aggregate and conserve thousands of acres of land in western Massachusetts (Franklin Land Trust, n.d.; Wildlands & Woodlands, 2010). Although their efforts stop at the border, the Conservation Trust (a national funder of loans to conservation organizations) lists them as potential distributers of conservation loans in southern Vermont (R. Hubbard, personal communication with FLT Executive Director, October 5, 2010). There are no

local land trusts active in Whitingham and the town is not active in acquiring land for conservation.

CHAPTER 3

OPEN SPACE AND NATURAL RESOURCES IN WHITINGHAM:

CURRENT CHALLENGES AND OPPORTUNITIES

The following sections describe the various natural resources and open space resources as they exist in Whitingham today. Likely future trends are discussed and ways of managing those trends are suggested.

3.1 Water Resources

Identified Importance

In general, water resources are important as a source of clean drinking water (well recharge), pollution filtration, flood and erosion control, critical wildlife habitat and migration corridors, and water based recreation. They are an important part of the town's rural and scenic character and enhance property value (Whitingham 2010; Austin et. al., 2004).

Water resources were highlighted in Goal 9 in Whitingham's draft town plan: "To protect lake shores, stream banks, and other significant natural areas and locations of special educational, scientific, historical, architectural, archaeological, or scenic significance." The draft town plan (referring to a public opinion survey) also notes that ". . .protecting Lake Whitingham [Harriman Reservoir] for its scenic and recreational values ranked very high for those who live and work in Whitingham" (Whitingham, 2010). The importance of water resources are specifically mentioned in the following identified policies of the draft town plan:

> **Natural Resource Policies:**
> Policy 2: Maintain the natural course, condition, or function of water courses and shore lands except for necessary crossings for adequate bridges or culverts.
> Policy 3: Maintain undisturbed buffers of native vegetation along shorelands.
> Policy 4: Reduce the potential for flood damage.
> Policy 5: Protect ground water resources throughout Town.

Policy 7: Protect Whitingham's wildlife habitat and discourage the fragmentation of large forest blocks areas.

Economic Policies:
Policy 3: Support tourism that draws on the character of Whitingham itself: its beauty, culture, history, wildlife and outdoor recreation.
(Whitingham 2010, p. 30-32)

The importance of water resources were also indicated indirectly in their capacity to contribute to the town's "natural beauty" which was ranked highest on the community survey "What are the three things you like most about Whitingham?" This is reflected in the draft town plan vision statement: "The working landscape of farm and forest, numerous lakes and ponds, and the open space these features provide are important to Whitingham's future." In the same survey, destruction of wildlife habitat and pollution of groundwater sources were rated the highest environmental concern among residents (Whitingham, 2010).

3.1.A. Existing Conditions

Regulations and Patterns of Subdivision

Current town zoning regulations prohibit construction within 125 feet of "lake" shores (Whitingham, 2000). This is an ambiguous designation, however, because most of the water bodies in town are referred to as "ponds." State law provides for a 50-foot no build buffer around all Class 2 water resources. Most resources within town are considered Class 2. The Deerfield River, an "impaired" water resource, is protected by the state with a 100 foot buffer requirement (Vermont Department of Environmental Conservation, 2003). Backfilling a wetland is strictly regulated by the state and the federal government and requires appropriate permits. Stormwater discharge permits may also apply to construction which results in large areas of impervious surface or causes significant storm water discharge (Vermont Natural Resources Board 2010). The construction of docks is also regulated by state law which prohibits stone or

concrete structures (Vermont Statutes, 24 V.S.A.). Although the town "requires" local plans to meet state regulations as a condition of local approval, local oversight is inconsistent (personal communications with Windham Regional Commission staff and Whitingham Planning Board Staff, 2010). State oversight is also limited and is typically triggered only in relation to development over ten acres in size via Vermont's Act 250 review. Federal and state oversight is lacking and local oversight is spotty (Vining & Kehler 1999; Sanford & Stroud, 1997; Vermont Department of Housing and Community Affairs, n.d.)

Subdivision regulations also affect water resources. Land in Whitingham is largely broken up into parcels under fifteen acres in size. This parcelization of land is most pronounced near water resources as multiple individual land owners vie to build on the waterfront (refer to Map 10). Whitingham has no subdivision regulations; zoning bylaws require a minimum parcel size of 1.5 acres (Whitingham 2000, 2010).

"Bowling Alley" Lots and Effects on Water Resources

Although new state septic review laws require state permits for all systems and prohibit septic systems on slopes greater than 20% (General Assembly of Vermont, 2002), Whitingham is significantly impacted by the legacy of Act 249 which caused the creation of many "bowling alley" shaped lots of 10 to 20 acres. In Whitingham and elsewhere, such lots typically present their narrowest dimensions on water bodies and roads (see Map 10). This in turn has caused the clustering of houses near the water resource. Landowners who own land on open wetlands, lakes, and streams may be tempted to plant lawns to the water border. Such activity eliminates important wetland wildlife habitat buffers, increases the potential for polluting runoff to end up in water (lawn fertilizers and pesticides for example), increases the likelihood of introducing invasive species into wetlands, and increases the possibility that disturbance-intolerant species

of birds and animals will leave the area (Mayer, P.M., Reynolds, S.K. & Canfield, T.J. , 2005). Neither Whitingham nor the State mandate vegetated buffers on Class 2 water resources.

Impervious Surfaces

In Whitingham, roads tend to follow the edges of wetlands and riparian corridors (where land is less steep). Large impervious surfaces (building roofs, paved roads and parking lots) in these areas can increase polluting runoff into waterways (National Oceanographic and Atmospheric Administration, n.d.). Because Whitingham does not have a lot of large buildings, and because it contains many "pervious" gravel parking lots and roads, very little of the town is covered with impervious surfaces overall. However, where they do occur, impervious surfaces are often very near water resources. Future development is likely to continue this trend and impervious pavement will likely become more common as dirt roads are replaced by paved roads. Bowling alley shaped lots exacerbate this issue by necessitating the construction of lengthy driveways. While traditional rural construction favored short driveways, houses close to roads, and large agricultural back lawns (or back gardens), modern landscaping favors spacious front lawns with long driveways and longer building set-backs. This kind of landscaping and building placement is becoming more prevalent in Whitingham as it is throughout the United States (Yakos & Wilhelm 1999; Stokes, Watson, & Mastran, 1997).

Steep Slope Regulation

Land in Whitingham is hilly and therefore contains widespread "steep slopes" of grades of 15% or greater (27% of land in the town; see Map 3). Construction on steep slopes increases the likelihood of erosion and the runoff of non-point source pollution. Roads built on steep slopes are more expensive to build and to maintain and can present access problems for emergency vehicles (Stokes, et.al., 1997). Whitingham does not regulate development on steep

slopes. Historically, steep slope development in town has not been common—but as flatter ground becomes scarcer, steep slope development will likely become more prevalent.

Floodplain

The prevalence of steep slopes mean that floodplain is mostly limited in town—along the North River in Jacksonville, around a few of the ponds and at Harriman Reservoir (a protected area). Refer to Map 7 for details. Current Federal Emergency Management Agency regulations restrict building in floodplains in order to protect public health and safety. Some buildings in Jacksonville have been "grandfathered in" because they were built before Federal Emergency Management Agency regulations were created (Whitingham, 2010).

Recreational Access

Residents of Whitingham have long enjoyed traditional recreational access to a number of water resources on private property due to a general lack of land posted "no trespassing" and the friendly, permissive attitude of neighbors (Whitingham, 2010). Backyards surrounding water resources may tend to discourage public recreational use out of common courtesy for privacy, but on the whole most water bodies and riparian areas have some point of unofficial public access at this point in time. With the exception of North Pond (a single local owner and posted at the road) and Ryder Pond (owned by an home owner's association but not posted), most of the lots surrounding small water bodies in Whitingham are owned by out of state individuals, developers, and investment trusts (see Map 10). All but four small lots on Sadawga Lake belong to out of state owners (Windham Regional Commission, 2010). Observations of posted land in town seem to correlate with second home development by out of state owners (visual sampling of no trespassing sign distribution conducted by author). Unprotected land around these resources is subject to development pressures. The development of land around water resources can result in a spiraling negative relationship: as land around water resources is

converted into private backyards, it is more likely to be posted; as more land around water resources is posted, use around non-posted water resource land intensifies; as use around non-posted water resource land intensifies, it is more likely to become posted; and as new development increases the population of the town, the use of water resources will intensify.

Water Resources and Conservation Non-Profits

The *Deerfield River Watershed Association* (DRWA) was created to protect water quality and encourage access and recreational activities along the Deerfield River and its reservoirs (Deerfield River Watershed Association, 2011), but this group appears to be minimally active at the town level. The *Vermont River Conservancy* (VRC) works throughout the state on similar issues; its efforts are currently under-represented in southern Vermont, indicating a potential future opportunity for Whitingham and other southern towns (Vermont River Conservancy, 2011). *Trout Unlimited* provides support for water quality and access projects that affect cold water recreational fishing; they are active in the eastern U.S. and are interested in the Connecticut River and its tributaries, such as the Deerfield River. Trout Unlimited is currently working on improving culverts within the greater Connecticut River Watershed (Trout Unlimited, n.d.). VLT holds a conservation easement on over 4,000 acres of land around the Deerfield River and its reservoirs in town. As land trusts are inclined to focus their acquisition efforts on protecting contiguous blocks of land (Foster et.al, 2010), areas abutting the Trans Canada land may be appealing to VLT.

A Local Example of Water Resources Protection

Ryder Pond, where there exists a five-hundred foot vegetated buffer between houses and the water front, is an example of development engineered to protect habitat and water quality. The state shows the pond as the home of an unidentified endangered plant species (Vermont Agency of Natural Resources 2007). The scenic value of the pond is protected as well:

houses are invisible from Route 100 and the shores of the pond. Property values of houses on the pond may be enhanced because the character of the pond frontage is retained in a natural state. It is important to note that the Ryder Pond development triggered a state Act 250 review which necessitated an examination of the impacts of the development on the pond (Vermont Natural Resources Board, 2006b).

3.1.B The Future of Water Resources in Whitingham

- As development in town increases, so will competition for land adjacent to water resources and land along roads that abut water. This will lead to increased land parcelization which in turn will concentrate even more development along water resources.
- As development pressure increases on flatter ground, more steep slopes will become developed. Such development increases the likelihood of erosion and non-point sources of pollution.
- The development of Act 60 legacy "bowling alley" shaped lots will result in a decrease of public recreational access to water resources, the expansion of impervious surfaces (long driveways), and the concentration of development impacts along water frontage.
- Spotty local support and oversight for the State mandated fifty foot no build wetland buffer will increase degradation of water resources and may open the town to expensive equal protection litigation.
- Ambiguity in what constitutes a "lake" may initiate challenges to the 125 foot no build buffer intended to protect lakes *and* ponds.

- As parcelization and development of waterfronts increases, so will the prevalence of "no trespassing" signs at private backyards abutting water resources. This will begin to strangle traditional recreational access.
- As development of waterfronts increases, so will habitat destruction and fragmentation. Certain intolerant species of wildlife will become scarcer or disappear from the area altogether. Invasive plant species will become more common and certain native plant species will become scare or vanish altogether.

3.2 Agricultural Resources

Identified importance

In general, farmland is an economic resource that provides employment and supports local commerce and farm related businesses. It can also be useful in providing a community with a source of locally grown food, thereby reducing fossil fuel consumption and travel trips to out-of-town grocery stores. Farmland is widely considered to be a scenic amenity and it may have historic value, not just in terms of historic farm buildings and landscapes but also as a historic vocation and way of life. During the fallow season, farmland may be used by recreationists for cross-country skiing, snowmobiling, and hunting. Farmland provides habitat for field and border dependent wildlife species and may function as wildlife corridor for certain species. It also can serve as a buffer between developed areas and forestland (Stokes, et.al., 1997).

Farmland is referred to directly in the Whitingham draft town plan, Goal 10: "to encourage the continued use of lands for agriculture and forestry" and indirectly in Goal 4: "to maintain the Town's characteristic pattern of settlement typified by villages within a rural setting." It is also referred to directly in Land Use Policy 3: "Maintain and encourage agriculture, forestry, and open space and recreational uses in rural lands" and Economic Development Policy

2: "Maintain and strengthen the economic climate for agriculture and forest products industries." According to the draft town plan vision statement: "The working landscape of farm and forest, numerous lakes and ponds, and the open space these features provide are important to Whitingham's future" (Whitingham, 2010).

3.2.A. Existing Conditions

Distribution of Soils and Farmland

As previously noted, over 13% of the town, 3,172 acres, contains soils that are highly suitable for agriculture, but not all of these soils are located beneath existing farms. Almost all of the suitable soil lies near existing roads. Some of it has been converted to residential lawn and some of it is wooded.

Whitingham has 1,137 acres of farmland including pasture, hay, cropland, and orchards. Farmland is scattered throughout town. Some of the largest housing lots support horse "farmettes" or limited haying operations on their expansive front lawns. The best farmland and soils are concentrated primarily in low, level areas and on relatively flat hilltops near to roads. Such areas are also the most suitable for development (Whitingham, 2010). As of 2002, Whitingham had twenty-five farms, up six farms from 1997. Most of these new farms were less than fifty acres in size. Only eleven of the principle farm operators listed farming as their primary occupation (United States Department of Agriculture, 2010). There are two dairy farms in town. The Morse Farm and the Corse Farm are the two largest farms with land ownership in excess of 1,000 acres combined (woodland and farmland); these farmers also lease other agricultural properties in Whitingham and in nearby towns (Whitingham, 2010; United States Department of Agriculture, 2010). Refer to maps 5 and 6.

Farmland Viability and Farm Conversion

Recent conversion of farmland into residential use is most evident along Route 8A, Holbrook Road, Town Hill Road, and Kentfield Road, but lighter conversion is evident throughout town (University of Vermont Extension Services, 2000). Because many farms tend to be marginally profitable, farmers often need to take second jobs to sustain themselves. The narrow economic returns on farming make farms more susceptible to development pressure. Farmland fragmentation occurs when larger farm parcels are whittled away by development. This impacts the regional viability of the farming economy (both farms and support businesses) and increases the likelihood of residential vs. farming legal conflicts (Stokes et.al., 1997; Yakos & Wilhelm, 1999b; Vermont Smart Growth, n.d.). When farmland is fragmented the remaining agricultural parcels may not qualify for Use Value Appraisal or be of interest to the buyers of conservation easements (Vermont Department of Forests, Parks and Recreation, Forestry Division, County Forester Program, 2010; Hamilton, J.E., & Moore, J., 2007). Large housing lots with big front lawns are particularly effective in fragmenting farmland because they consume more land per person than do small housing lots. Such development styles are becoming more common in Whitingham and in New England in general (DeNormandie, 2009; Yakos & Wilhelm, 1999a; Theobold, 2005).

There is a growing trend in Vermont and throughout New England toward the conversion of farmland (DeNormandie, 2009; Yakos & Wilhelm, 1999a). Because farmland does not need to be cleared prior to development, it is less expensive to prepare for construction. Scenic farmland may also appeal to prospective homeowners who like the idea of living on a farm (sans conducting any substantive agriculture), in a field with views, or near existing farmland (DeNormandie, 2009; Stokes et.al., 1997; Yakos & Wilhelm, 1999a). In Vermont, 40% of the land developed between 1982 and 1992 was former farmland (Smart Growth Vermont,

1999; University of Vermont Extension Services, 2000). While development pressures in Whitingham are relatively mild compared to resort-oriented Wilmington to the north, the community is just one town removed from the so-called "sprawl danger zone," a region identified as the edge of a suburbanization front expanding from the Connecticut River Valley of Massachusetts (DeNormandie, 2009). It also lies along an alternative north-south ski tourism corridor that connects "The Mohawk Trail" Route 2 in Massachusetts and "The Molly Stark Highway" Route 9 in Vermont. The Berkshire East ski area of Charlemont, Massachusetts is located along Route 2 directly south of Whitingham and the Stratton and Mount Snow related ski resort development is located just to the north in Wilmington. Colrain, Massachusetts, partially within the "sprawl danger zone," saw a 3.6% increase in new homes between 1999 and 2005 (DeNormandie, 2009). In 2004 the nearby town of Heath, Massachusetts instituted phased growth development bylaws to slow its pace of development (Heath, 2011). To the east of Whitingham, the town of Halifax, Vermont saw the greatest increase in population in Windham County between 1990 and 2000 (United States Census Bureau, 2000). Although population growth rates in Whitingham are not as high as they are in other towns to the south and north, Whitingham is geographically susceptible to future growth spikes as residential development pushes north and west from Massachusetts and second home interests push south from Wilmington and north from Charlemont.

Regulatory Influences

The Town of Whitingham has no agricultural regulations other than a right to farm bylaw. Act 250 development review may discourage some farmland conversion, especially if the town is active in petitioning the state and backs up its interests with strong conservation language in master plans and open space plans, as was included in the 2010 draft town plan (Whitingham, 2010).

Conservation of Farmland and Financial Assistance for Farmers

The town has 2,500 acres of land in Use Value Appraisal (UVA), including 210 acres of active farmland. The town has 477 acres of land in conservation easement, including 125 acres of active farmland. More than half of the town's farmland has no protection at all (Whitingham, 2010). UVA enrollment is usually restricted to farms of twenty five acres or larger (Vermont Statutes 32 V.S.A., 2010) and the only non-profit active in the purchase of conservation easements, VLT, is primarily interested in tracts of land fifty acres or more in size. VLT's work is also spread throughout the state of Vermont. VLT is willing to work with towns to conserve smaller parcels *only* if the town has identified such land as locally important and there is local support for land acquisition (personal conversation with VLT southeast Vermont regional director Joan Weir, September 2010; VLT, Community projects, n.d.). The Vermont Housing and Conservation Board (VHCB) also offers grants toward the purchase of conservation land and easements (Vermont Housing and Conservation Board, Conservation programs, n.d.). There are no local land trusts in the vicinity of Whitingham and the town is not active in acquiring land for conservation through state programs.

With regard to financial assistance available to farmers, the state offers the *Vermont Farm Viability Enhancement Program* funded through the *United States Farm Bill.* VHCB also provides various forms of technical and financial assistance grants to farmers (VHCB, Farm Viability, n.d.). The United States Farm Bill and other federal incentives available through the Natural Resources Conservation Services offer a number of programs to assist farmers. These programs provide loans, technical support, and grants for certain kinds of agricultural rehabilitation, equipment purchases, and training (Natural Resources Conservation Service, 2011). However, laypeople often find these programs and their application processes confusing (Boshoven, 2010).

Historic Preservation of Agricultural Land and Buildings

Old barns and farms are part of the scenic and historic landscape of Whitingham. Communities that fail to take steps toward protecting such historic structures may see them fall to entropy, be disassembled and carted off by trophy hunters from away, or be torn down and salvaged for the designer wood market (Cauchon, 2002; Schweitzer, 2003). Historic preservation grants are available to protect these structures, for instance, the 2010 *Barn Preservation Grants* which awarded $208,000 toward the renovation of twenty-five barns in Vermont (Vermont Division for Historic Preservation, Barn grants, n.d.; Vermontbiz.com, 2010). The Preservation Trust of Vermont, a non–profit, also works with towns to protect historic resources and provides funding and grants (The Preservation Trust of Vermont, n.d.). Obviously, grants help defray farm maintenance costs and therefore make farms more economically sustainable. A related effort, the Barn Census, is an attempt to document historic barns throughout the state (Vermont Barn Census, n.d.). Census documented barns will likely be more appealing to preservation grant providers. State and federal historic register programs are also ways of documenting the significance of historic farm buildings. Whitingham has not inventoried its historic farm and barn structures and has no plan for their historic preservation. Map 6 and 9 show the location of historic sites and farms.

3.2.B. The Future of Agricultural Resources in Whitingham

- The so called "sprawl frontier," expanding northwest from Massachusetts, will eventually have an impact on Whitingham. This may happen very gradually or come as a boom (a similar boom triggered the original Act 250 legislation). The proximity of the town to ski areas will likely result in continued second home development.

- Although growth in Whitingham has been slow, farmland conversion is evident in town and will likely increase due to the low profitability of farms, desirability of scenic agricultural areas for home building, proximity of farmland to roads, and a trend toward smaller farms which do not qualify for the UVA program.
- The trend in Whitingham (and in Vermont overall) is toward smaller, more diverse farmsteads. While this trend may increase the number of farms in Whitingham, large agricultural landscapes and the town's overall acres in agriculture will likely decrease.
- As development increases in hilly Whitingham, so will competition for the remaining land located on slopes of less than 15%. Much of the farmland in town lies in such areas. As farmland becomes developed, areas that were formerly open to hunters, snowmobilers and other recreationists will become increasingly unavailable to the public. Certain existing snowmobile trails may have access and connectivity cut off.
- Edge habitat and wildlife migration corridors will be impact by farmland conversion. Species that depend on edge resources and migration corridors will be negatively impacted.
- As farmland becomes developed, parts of the town, especially areas that were once farms, will become increasingly suburban in character.
- Some historic farm structures, unless protected and renovated, will become dilapidated and subsequently torn down or salvaged for designer timber.

3.3 Forest Resources

Identified Importance

In general, forests are an important to the local economy in terms of saw timber, pulpwood, firewood, and maple sugaring. They are an important scenic amenity and they can

provide places to hunt, hike, snowmobile, etc. Forests sustain natural communities and ecosystems and provide vital habitat for a variety of plant and animal species. They are also essential corridors for animal species migration and plant species distribution. Large undisturbed areas of forest are necessary for preserving biodiversity and preventing the genetic stagnation of species. Forests enhance water quality and fisheries by protecting ground water recharge areas and diluting erosion runoff. They naturally store carbon and consume carbon dioxide, helping to mitigate global climate change (Stokes et.al., 1997; Austin et.al., 2004; Foster et.al., 2010).

The importance of forestland to the town of Whitingham is emphasized in Goal 4 of the draft town plan: "to maintain the Town's characteristic pattern of settlement typified by villages within a rural setting," Goal 9: "to protect lake shores, stream banks, and other significant natural areas and locations of special educational, scientific, historical, architectural, archaeological, or scenic significance," and Goal 10: "To encourage the continued use of lands for agriculture and forestry." The importance of forestland was also indicated indirectly in its capacity to contribute to the town's "natural beauty" which was ranked 75% (highest) on the community survey "What are the three things you like most about Whitingham?" In the same survey, destruction of wildlife habitat and pollution of groundwater sources were rated the highest environmental concerns among residents (Whitingham, 2010). The following draft town plan policies mention the importance of forestland:

> *Natural Resources Policies:*
> Policy 1: Carefully review all development proposals to ensure minimal negative impacts on Whitingham's natural resources.
> Policy 3: Maintain undisturbed buffers of native vegetation along shorelands.
> Policy 5: Protect ground water resources throughout Town.
> Policy 7: Protect Whitingham's wildlife habitat and discourage the fragmentation of large forest blocks areas.
>
> *Land Use Policies:*

Policy 3: Maintain and encourage agriculture, forestry, and open space and recreational uses in rural lands.
Economic Policies:
Policy 2: Maintain and strengthen the economic climate for agriculture and forest products industries.
Policy 3: Support tourism that draws on the character of Whitingham itself: its beauty, culture, history, wildlife and outdoor recreation.
(Whitingham, 2010)

3.3.A. Existing Conditions

Forest Ownership, Distribution, and Conservation

Trans Canada owns 3,377 acres of forestland in Whitingham on which VLT holds a conservation easement. The State of Vermont (Department of Fish and Wildlife) owns and manages 800 acres of forested land and wetland in its Atherton Meadows Wildlife Management Area, which is managed for forest products and wildlife habitat. In addition to its easements on Trans Canada land, VLT has conservation easements on 350 acres of forested land (primarily on the wooded portion of farmsteads). Refer to Map 8. The remainder of forestland in the town (15,470 acres) is owned by private parties and is not perpetually protected. Of the 15,470 acres of unprotected forest land, 2,290 acres of forested land is enrolled in Use Value Appraisal (UVA). Lands in conservation easement are also usually enrolled in the UVA program. However, most forest land in Whitingham is not enrolled in the UVA program. (Whitingham, 2010).

Forest use and management

The State of Vermont and Trans Canada conduct forestry on their lands. Private parties also harvest wood products. A variety of forestry practices are conducted on these properties ranging from well planned "sustainable" forestry methods directed by licensed foresters to "backyard" cutting for fire wood. Forest management on state lands may vary in practice and outcome but is required to follow state forestry practices which mandate the application of best management practices when harvesting (Vermont Agency of Natural Resources, 1998). Forestry

conducted on UVA enrolled "forestry" land requires a forestry plan approved by the state and updated every ten years unless that land is being used for maple sugaring, in which case it may optionally be managed under UVA terms for agricultural land (Vermont Statutes, 32 V.S.A.). VLT allows for forestry on most of its conservation easements as per state standards (Vermont Land Trust, n.d.). No data exists to show the quality of management being done on private land not enrolled in the UVA program. However, the state does operate a Forest Stewardship Program which provides limited advice for landowners who practice forestry (Vermont Division of Forestry, 2001).

As has been discussed in the Water Resources section of this project, much of the land in Whitingham has been subdivided into lots of fifteen acres in size or less. However, lots of less than 50 acres are generally considered not productive enough for the purposes of commercial sawlog or pulpwood timber management. A minimum of 25 acres is necessary for the sustainable management of fuelwood for one single family home. Smaller size lots are inadequate for home fuelwood production and are therefore more likely to be unsustainably managed (Beattie, Thompson, & Levine, 1993; United States Department of Agriculture, n.d.).

Forest Habitat

The State of Vermont has identified several important kinds of forest habitat in Whitingham. *Deer wintering areas* refer to habitat critical for white-tailed deer survival. These so-called "deer yards" include sheltered evergreen lee-slope areas that see less than average snow depth in winter and have a significant amount of understory food browse. Three hundred and forty acres of deer wintering area have been identified in Whitingham, all in the western quarter of town (Whitingham, 2010). Other deer wintering areas may very well exist but have not been identified and inventoried. Wintering areas may also change as forests mature, are cut, or are damaged.

Bear Habitat, identified through studies done by the Vermont Agency of Natural Resources (VANR), engulfs all but the central portions of Whitingham around Route 100 and the village centers. *Mast stands*, areas of trees that provide exceptional quantities of food for wildlife, have not been identified in Whitingham, probably due to lack of research (Vermont Agency of Natural Resources, n.d.).

The state has also identified several "spot" areas of critical wildlife habitat where species of special concern have been positively identified—at Ryder Pond, Atherton Meadows, the Deerfield River, Sadawga Pond, and Jacksonville Pond (Whitingham, 2010).

In its *Wildlife Linkage Habitat Analysis* (WLHA), the Vermont Department of Fish and Wildlife (VDFW) identified areas in Vermont that represent the most unfragmented natural habitats (Vermont Department of Fish and Wildlife, 2006). In Whitingham, areas rated "least fragmented" include most of the western third of town (Trans Canada and state land), roughly 2,000 acres of roadless privately owned land on the south side of town between Sherman Reservoir and Brown Brook, and several wooded hilltop areas on the east side of town (Whitingham, 2010; Vermont Department of Fish and Wildlife, 2006). From the WLHA data and other VANR wildlife data, the town and Windham Regional Commission identified four potentially important wildlife road crossings in the recent draft town plan which could serve as links between these larger blocks of habitat (Whitingham, 2010). Finally, because Whitingham borders Massachusetts, where more thorough habitat research has been done, some extrapolations of habitat trends across the border suggest themselves. In particular, Massachusetts data suggests Brown Brook (south central Whitingham) and the Deerfield River around Sherman Reservoir as particularly important habitat (Massachusetts Department of Conservation and Recreation, 2009; Massachusetts Department of Fish and Game, 2003a, 2003b, 2006, 2008a, 2008b; University of Massachusetts, 2010). Overall, the quality of this

habitat is largely determined by its unfragmented status. With more fragmentation—in terms of roads and buildings—habitat quality will diminish (Austin et.al., 2004). See Map 11 which shows habitat connectivity in Whitingham using Massachusetts and Vermont measures of ecosystems integrity, town recognized wildlife crossings, and VANR identified habitat areas. Also shown in this map are extrapolations across state lines based on more rigorous habitat assessments conducted in neighboring Massachusetts, and an analysis of likely amphibian migration paths over roadways that divide wetlands areas. See also Map 12, which shows relative connectivity between unfragmented habitat blocks in Whitingham in regional context.

Recreational Access

As discussed in detail in the subsequent Recreational Resources section of this project, privately owned forested land is largely open to the public in Whitingham. Town residents have enjoyed access to private lands within town for hunting, fishing, hiking, wildlife observation, and snowmobiling for generations (Whitingham, 2010).

Watershed Support

Forested land protects water resources by inhibiting soil runoff and by reducing surface water evaporation. Trees and plants also filter non-point source pollution runoff and filter out water contaminants. Healthy forests support healthy water ecosystems (Austin et.al, 2004). Water resources, including wooded wetlands buffers, are described in detail the Water Resources section of this project.

Invasive species and climate change

Invasive species and climate change represent threats to the integrity and composition of Whitingham's forest ecology and threats to the town's economy. Vermont, like the rest of the northeast United States, has been affected by global climate change trends (United States Environmental Protection Agency, 2011). Foreign invasive species like the Hemlock Wooly

Adelgid, susceptible to cold weather, have recently arrived in southern Vermont (Vermont Department of Forests, Parks and Recreation, 2011), while other threats, such as the Asian Longhorned Beetle, have affected nearby areas of New England (USDA, 2011). Climatically, Whitingham is located less than twenty miles north of the forest type boundary between the oak dominated temperate forests of southern New England and the maple-birch dominated northern hardwood forest. The sugar maple, important to the local economy, thrives in the latter forest type (University of Massachusetts, Amherst, 2004).

Forestland Conversion and Subdivision Regulations

As explained in the Agricultural Resources section, acknowledgement of Whitingham's status as a slow-growing community should be tempered by the understanding that the town is in the path of converging high growth areas to the north and south. Although not as appealing or as easy to develop as farmland, privately held forestland is not immune to development pressures. Forestland conversion in town is most concentrated around water resource areas and along the town's north and south borders adjacent to Wilmington and Heath (Whitingham, 2010). Because town subdivision regulations do not exist and zoning regulations are minimal, Whitingham has no effective means of managing the conversion of forestland in town.

3.3.B. The future of Forestland in Whitingham

- Lacking adequate bylaws by which to regulate the placement of roads as well as road frontage, setbacks, and lot size, Whitingham's forests will become more fragmented, especially when suitable lots bordering existing roads become built out. Extensive roadside build-out will also isolate intact habitat blocks, resulting in the stagnation of the genetic pools of species and the weakening or local extinction of marginal species. Plant and animal species intolerant to human encroachment will become scarcer.

- As steep slopes and forested wetlands areas become more developed, runoff of non-point source pollutants into water bodies, wetlands, and riparian areas will become more common.
- As forest cover becomes fragmented, so will recreational access. Hunting access points and town-wide trail systems, such as Whitingham's network of snowmobile trails, will become lost or fragmented.
- The subdivision of forestland into smaller and smaller parcels will have an impact on the local forest products industry which cannot profitably operate on parcels of less than 50 acres in size. Below 25 acres, and a parcel of land can no longer support sustainable fuelwood production for a home. Land trust such as VLT are primarily interested in land of 50 acres or more in size. Parcels below 25 acres in size do not qualify for the state UVA program, which offers land owners tax breaks in exchange for not developing their land. Without this incentive, landowners are more likely to develop. As forested land is removed from the UVA program, associated forestry management plans may cease or become irrelevant, increasing the amount of poorly managed forest. The effects of improper management of forestland include reduced habitat integrity, reduced water quality, and reduced recreational access, as well as reduced future economic returns on forest products.
- Roads and permanent human incursions into wooded areas increase the possible avenues of invasive species.
- Climate change will eventually force a change in the composition of Whitingham's forests. Northern hardwood species will retreat to hilltops and north slopes while southern hardwood forests (predominantly oak) will begin to move into the lower parts of town. Higher elevations of town, such as hilltops and the north sides of ridges, could

become the last "islands" where maple sugaring can still be economically practiced within Whitingham. Whitingham does not currently regulate steep slopes or hilltop development.

3.4 Recreational and Scenic Resources

Identified Importance

In general, open space and undeveloped land provide communities a number of recreational opportunities such as hiking, fishing, hunting, snowmobiling, skiing, ice skating, bicycling, nature observation, swimming, picnicking, and boating. Open fields can serve as places to practices active sports such as soccer and baseball. Farmland, forests and water resources provide a backdrop for small New England towns that is historic and scenic and adds to quality of life. Such landscapes and recreational amenities also provide economic returns to residents in terms of tourist dollars (Stokes, et. al, 1997).

The protection and development of open space recreational opportunities is highlighted in draft town plan Goal 3: "To provide adequate community facilities and services to the citizens and visitors of Whitingham" and Goal 9: "To protect lake shores, stream banks, and other significant natural areas and locations of special educational, scientific, historical, architectural, archaeological, or scenic significance." Although 76% of residents were happy with current recreational resources in town, when asked what recreational improvements were most needed, residents identified hiking trails, swimming areas, and boat launch areas (Whitingham, 2010). The following draft town plan policies relate directly to recreational and scenic resources:

> *Community Facilities and Services Policies:*
> Policy 11: Recreational resources should be enjoyed by the public in a manner that will not reduce or destroy the value of the site or the area.
> Policy 12: Encourage the preservation of significant scenic resources.

Transportation Policies:
Policy 4: Promote and encourage pedestrian and bicycle use and any other alternative modes of travel.

Land Use Policies:
Policy 3: Maintain and encourage agriculture, forestry, and open space and recreational uses in rural lands.
(Whitingham, 2010).

Policies that relate to water resources, forestland, and agricultural land are inherently tied to outdoor recreational use and scenic amenities as well.

3.4.A. Existing Conditions

Public Access to Open Space Land Resources

As was touched on in the Water Resources section, residents of Whitingham have long enjoyed traditional recreational access to privately owned open space due to a general lack of land posted "no trespassing" and the friendly, permissive attitude of neighbors (Whitingham, 2010).

Land to which the public is allowed access by deed restriction or conservation easement includes VLT easements on Trans-Canada lands and the state's Atherton Meadows Wildlife Management Area. These combined areas make up 15% of the town but are concentrated on the west side of Whitingham. Other public open space is small and scattered. Notable places include Town Hill Park and the boat ramp at Sadawga Pond. Parking for many public resources is very limited, especially at Harriman Reservoir. Residents living on the east side of Whitingham (including the village of Jacksonville) have little guaranteed access to recreational open space (Whitingham, 2010). Refer to maps 8 and 9.

Boating and Boat Access

The town is well served by car-top boating access at Harriman Reservoir and Sadawga Pond but not at its smaller water bodies. Parking at Harriman Reservoir for motor boat and sailboat trailers is very limited; adequate trailer parking is only available at boat ramps located to the north in Wilmington. Sherman Reservoir and the Deerfield River are accessible from Readsboro and Rowe; steep undeveloped terrain on the Whitingham side precludes vehicle access. The state operates a boat launch and small parking lot at Sadawga Pond. The North River is too shallow for all boating except perhaps kayaking during very high water periods (Whitingham, 2010). See Map 9 for details.

Snowmobiling Access

Whitingham contains an extensive network of snowmobile trails extending throughout the town and connecting to all neighboring communities. Trails on the west side of the town pass through state land or are allowed by easement through land owned by Trans-Canada. The rest of the trails (over two-thirds) pass through private land with access subject to the goodwill of landowners. Parking for snowmobiles is located at the Jacksonville municipal building, but spaces are limited. The nearest large dedicated parking facility for snowmobile trailers is located at the junction of Route 9 and 100 in Wilmington at a field which is used in the summer as a flea market. Trails are maintained by two local clubs (Whitingham, 2010). Refer to Map 9.

Hunting and Fishing Access

Hunting and fishing are allowed on Trans-Canada land, state land, and by default on much of the non-posted private land in town, subject to state regulations. The town's abundant forest land and agricultural land support the viability of these sports (Whitingham, 2010). Of the town's waterbodies, only North Pond is posted against access (visual survey by author).

However, "bowling alley" shaped lots (see Map 10) and large cleared estates at strategic locations can confound hunting access to the landlocked back acres of adjacent lots.

Playgrounds and Athletic Fields

Improved recreational facilities are located at Town Hill and at the school. A baskeball court is located behind the town hall in Jacksonville. Residents ranked the need for more of these facilities as very low (Whitingham, 2010).

The Catamount Trail

The Catamount Trail is a cross country ski trail which extends the length of Vermont south to north. It passes through the west side of town mainly through Trans-Canada land eased to VLT and the CTA. Part of the trail along the Deerfield River just east of downtown Readsboro is a "road walk": the trail ceases to exist there (Whitingham, 2010; Catamount Trail Association, 2007). There is no direct access to the southern terminus of the Catamount Trail at the Massachusetts border due primarily to the presence of the now decommissioned and partially removed Yankee Nuclear Plant in Rowe. The ultimate fate of the Yankee lands post-cleanup has not yet been determined (Yankee Rowe, n.d.). In places, the Catamount Trail shares its trail bed with snowmobile routes. Although the Catamount Trail is not maintained for summer use, it is generally passable to hikers and mountain bikers. Road signage directing visitors to the Catamount Trail does not exist (Catamount Trail Association, 2007; visual observations by author). Refer to Map 9.

Bicycling

The town has no bicycle trails or dedicated bike lanes. Route 100 has enjoyable scenery with narrow shoulder widths but good turn visibility and travel lane width, making for an adequate but not ideal rural bicycle route. Route 116 and 8A have no shoulders and narrower travel lanes but have less traffic volume than Route 100 and also have good turn visibility. Local

paved roads, with their light traffic volume and attractive landscapes can be very rewarding places to bicycle, although many of these roads are quite hilly. Potholes, soft shoulders, and bumps in the town's many gravel roads make them inadequate for tour biking but fine for mountain or hybrid bikes (Fish & Ryan, 2000; Whitingham, 2010; visual observations by author). Relatively light traffic and lower elevations, and abundant rural scenery make the town's roads comparably pleasant to ride as Route 9 to the north or Route 2 in Massachusetts (which have wider shoulders). However, most bicycle tour guides and tour services do not mention Whitingham's roads (survey of available bicycle tourism information by author). Map 1 shows town roads.

Hiking

Although unofficial hiking routes exist in town, there are no official marked hiking trails. Trails at Atherton Meadows are unsigned and poorly constructed; many pass through active logging areas. A short unmarked footpath through a picnic area to a rock outcrop exists at Harriman Reservoir just off Route 100. Entrances to these areas are minimally marked from the road (Whitingham, 2010; visual observations by author).

Swimming

There are no official public swimming areas in Whitingham or Jacksonville (Whitingham, 2010). The nearest public swimming areas are located in Readsboro at Lion's Club Park and in Rowe at Pelham Lake Park. The Green Mountain Beach at Lake Raponda, located in Wilmington, is open to Wilmington residents only (Wilmington, 2009). Unofficially, people often swim at the picnic area on Harriman Reservoir just west of Whitingham center on Route 100 (Whitingham, 2010). Sadawga Pond has no beach and the town's smaller ponds are either inaccessible except by bushwacking, too shallow, too environmentally sensitive, or too muddy to support a beach (Whitingham, 2010; visual observations by author).

Unique Scenic Resources

The draft town plan identified a number of unique scenic resources to which there is no official public access, including Sprague Falls, Holbrook Mill Pond, Shippee Pond, and Laurel Lake (Whitingham, 2010). Gates Pond, Jacksonville Pond, Clara Lake, and Ryder Pond can be accessed via abutting roads although some waterfront strips near roads remain in private hands. North Pond offers visual roadside scenic access but not physical access; its frontage is posted no trespassing. Sadawga Pond and the two reservoirs on the Deerfield River have boat ramps. Sherman Reservoir ramps are located in Readsboro. Parking is a problem at most lakes and reservoirs. Other unique scenic resources include another waterfall along Route 100 just west of Jacksonville, the North River corridor, the Deerfield River corridor, the top of Hosley Hill overlooking Jacksonville, and the former Burrington Hill Ski Area (still fondly remembered by residents). With the exception of the Deerfield River and North River, access to these resources is entirely through private property. The Deerfield River is eased for public access and the North River is accessible for fishing from bridges and small unsigned tracts of public land in Jacksonville. The Green Mountain Boulder (also called the Green Mountain Giant Boulder), as big as a cottage and Vermont's largest glacial erratic, is located in Atherton Meadow Wildlife Management area but has no marked trail access (Whitingham, 2010; visual observations by author). See Map 9 for details.

Scenic Vistas

Whitingham is blessed with a number of scenic vistas visible from roads, especially where extensive areas of farmland have not been obscured by residential housing. Scenic views are also excellent at Town Hill, Sadawga Pond, and along Route 100 near Harriman Reservoir. Town regulations do not provide for the protection of these scenic vistas (Whitingham, 2010; visual evaluation of scenic vistas conducted by author).

Historic Sites

Whitingham contains nine small cemeteries, historic buildings, and other historic sites. Town centers are dense with historic buildings, many of them listed on state and national registers (Whitingham, 2010). Historic preservation grants are available through a wide range of providers including *Vermont Old Cemetery Association*, *Preservation Trust of Vermont*, and many state and federal agencies (Vermont Division for Historic Preservation, 2011). Some of these grants can be tied in to local trails and parks initiatives (Gibson, 2005). Whitingham has conducted historic preservation with Windham Regional Commission in its village centers but not its rural areas (Whitingham, 2010), with the exception of the Amos Brown House near the Massachusetts border, which is owned by The National Trust (Whitingham Historical Society, 1995). Map 9 shows historic sites.

Regional Recreational Connectivity

While snowmobile routes are well connected regionally both in and out of state, the Catamount Trail has good in-state connectivity only; it does not link to nearby Massachusetts trail systems. Hiking trail connectivity in town is non-existent. The Deerfield River is well connected as a water trail (Catamount Trail Association, 2007; Appalachian Mountain Club, 2009; Whitingham, 2010). See Map 11 for details.

Recreational Maps and Guides

Maps and descriptions of the Catamount Trail and Deerfield River can be found on-line and in print. Snowmobile maps can be obtained through membership in local snowmobile clubs. Harriman Reservoir is mentioned in the Green Mountain Club's hiking guide and a few other such publications (Green Mountain Club, 2006). A topographic map and brochure of Atherton Meadows is available online through the state website (Vermont Department of Fish and Wildlife, n.d.). No comprehensive map or guide of town recreational resources exists.

Funding for Recreational Resources Development and Recreational Lands Protection

There are no local efforts to conserve land for recreational or scenic purposes, but there are regional initiatives (Whitingham, 2010). VLT is a purchaser of conservation easements throughout the state but does not emphasize the purchase of conservation easements for recreational use and does not make it a practice of acquiring land in fee simple (Vermont Land Trust, n.d.; personal conversation with VLT southeast Vermont regional director Joan Weir, September, 2010). The Vermont Housing and Conservation Board offers grants and other support for land acquisition initiatives for the purchase of conservation land and easements that preserve and protect land that has value to local communities, including recreational land and scenic landscapes. The *Vermont Recreation Trails Grant Program* (comprised of the federal National Recreation Trails Fund and Vermont Recreation Trails Fund dollars, both sourced from the U.S. Department of Transportation), the Vermont Agency of Transportation's *Bicycle and Pedestrian Program* and the Vermont Agency of Transportation's *Transportation Enforcement Program*, and the National Park Service's *Rivers and Trails Program* are sources of funding for trail building and recreational lands acquisition on both the local and regional scale (Vermont Department of Forests, Parks and Recreation, 2005). Of particular local interest is the Vermont Community Foundation's *Deerfield River Enhancement Fund*, which will contribute $15,000 in 2011 to projects tied to the Deerfield River and its reservoirs (Vermont Community Foundation, 2011). Regionally, the *Deerfield River Watershed Association* (DRWA) and the CTA are engaged in resource protection, access, and land protection strategy with regard to the Catamount Trail and Deerfield River, although neither of these groups purchases land or easements (Catamount Trail Association, 2007; Deerfield River Watershed Association, 2011).

To be competitive for most of these grants, towns must be able to show active teleological trail planning (including planning maps) and in many cases regional trail connectivity plans. Whitingham has not engaged in trail planning (Vermont Department of Forests, Parks and Recreation, 2005; Gibson, 2005; Fish and Ryan, 2000; Stokes & Mastran, 1997).

3.4.B. The Future of Recreational and Scenic Resources in Whitingham

- As development increases in town, the amount of land available for outdoor recreation will decrease. Private land is more likely to be posted as recreational use and access pressures intensify. Access to public lands and open private land via abutting restricted or developed private land will become more problematic. Unique resources such as hilltops, ponds, and waterfalls located on private land may be posted as off limits to the public.
- As development increases in town, scenic landscapes will be eliminated or obscured.
- As development increases in town, snowmobile trails will become more fragmented.
- As development in town increases, the quantity and quality of wildlife and aquatic habitat will decrease, resulting in a corresponding decrease of hunting, fishing, and wildlife viewing opportunities.
- As development increases, residents of eastern Whitingham (including the village of Jacksonville) will have to travel by car more frequently in order to access recreational areas and open space. This will have impacts on public health and increase the carbon footprint of families as well as take valuable business outside of town (Vermont Department of Forests, Parks and Recreation, 2005; Gibson, 2005; Stokes & Mastran, 1997).

- Lack of signage, access points, trailheads, well managed trails, parking areas, spatial resource connectivity, and comprehensive maps and guides will continue to encourage many tourists to recreate elsewhere. This may indicate a loss of economic possibility to the town.

CHAPTER 4

INTERVENTIONS

The following interventions address the challenges listed in the sections above.

4.1 Minimal interventions

Minimal interventions require little effort or financial overhead. Each is beneficial by itself and can stand alone. Some of these interventions reiterate state regulations locally; re-emphasis strengthens them at the local level where state oversight might be limited.

a. Require all new development to either meet or prove exemption from state storm water management regulations as a requirement for the granting of local permits and the approval of plans. This intervention assures that state laws controlling stormwater management are not ignored.

b. Require new road construction according to the specifications in Vermont's *Clean and Clear Action Plan*. The Clean and Clear Action Plan is a best management practices program which provides technical guidance, design manuals, and grants that support the adequate and sustainable construction of public gravel roads. Stormwater controls are written into the program. Developers would be required to indicate how their road systems comply with it (Vermont Agency of natural Resources Clean and Clear Action Plan (VANR, 2010).

c. Require and enforce compliance with state mandated fifty foot conditional no build buffers around water resources and state/federal permits for the backfilling of wetlands. All water sources in Whitingham are classified by the state as "Class II" and require a fifty foot no-build buffer. Permits to build within that fifty foot zone must be acquired from the state. In

addition, the Deerfield River is classified as "Class II: Impaired" must be buffered at one hundred feet. Compliance would be reviewed via permitting and enforcement would be evaluated by the building inspector.

d. Require permits for new or renovated docks per state standards. Before building a dock, a state permit would need to be submitted to the town.

e. With regard to the current 125 foot lake buffer (in existing town zoning bylaws), clarify the term "lake" to include a list of all affected ponds and lakes in town, *by name*. Consider adding major wetlands (0.5 acre in size or more) to the list of water resources protected by buffers. These should also be identified by name or location.

f. Maintain and strengthen language in the town's right-to-farm bylaw to protect all kinds of farming from legal conflicts with residential use. Require developers who plan to build housing subdivisions near pasture or cropland to buffer new houses with 50 foot forested strips.

g. Limit soil mining. Prohibit the removal of state and federally identified quality soil except to make room for roads and buildings or where topsoil removal is necessary for approved substrate mining. In the case of substrate mining, the mining operation should be required, through a performance bond or other guarantee procedure, to re-soil and re-vegetate the area after mining is completed.

h. Inventory historic farm structures and participate in the Barn Census and other historic register programs. This task could be accomplished by a small team of volunteers or the town historic association.

i. Create a demolition delay bylaw with right of first refusal for historic structures. Require a 1-year demolition delay and Right of First Refusal (to the town or town approved non-profit) with regard to tearing down (or significantly altering the exterior of) town historic buildings, including barns and farms, that are 80 years old or more or have other identified

historic significance. This allows the town the option to work with external partners in preserving historic town structures, if desired.

j. Mandate the inclusion of natural resource information in plans. Require that all subdivision plans, special permits, and building permits for new structures include a map showing the extent of quality soils on the property and the extent of wetlands and floodplain (or indication that they do not exist there). The location of these resources would be provided by the town via maps routinely produced by the Windham Regional Commission. Landowners would be required to copy the maps to their own plans. The intent of this is to inform: if a landowner is aware of a resource, he or she may be more likely to want to protect it by building appropriately. This procedure should apply to development anywhere in the town. Even small parcel owners may be interested in knowing where the best garden space is on their property.

k. Encourage the expansion of shoulders along state highway 100 through town. The town would advocate with the state for such work at such time that the route is scheduled for resurfacing. Elements in a town plan or a Open Space Plan could be referred to as the opportunity arises. Wide shoulders could be marked as bike lanes. Bike route signage could be placed along the route.

l. Construct a three-season information booth at the junction of Route 9 and Route 100 in Wilmington. This location, near a flea market, would be an ideal place to have a small tourist information shed; it would likely be a worthwhile place for the town of Wilmington to do so as well because it would capture the traffic coming from Brattleboro west from I-91 before busy downtown Wilmington where parking is at a premium. The two towns could share such a structure. The shed could be leased from the state and located at the flea market parking area, or at the antique shop next door (which would enhance their business). The shed could be locked at night and opened in the morning; it could be staffed on summer and holiday

weekends via a stipend generated from local business contributions and/or state economic incentive grants. Information distributed would benefit local businesses as well as promote recreational and agricultural tourism in town.

m. Create small community "bench" parks. Obvious locations for community "bench" parks are the dam at Sadawga Pond (which could be easily and inexpensively fitted with benches and a staircase), the Deerfield River overlook at the power line crossing on Lone Pine Road, the dam at Clara Lake, Jacksonville Cemetery at Jacksonville Brook, and the southwest corner of Jacksonville Pond. Park projects near the centers of villages could apply for a wider range of grants (such as Community Block Grants) than the more rural conservation projects further from town centers. See Map 9 for details.

n. Prepare for future park needs. Although the town feels well served by existing playgrounds and athletic fields, as the population of Whitingham increases so may the desire for more athletic fields. Town regulations should prevent the conversion of prime agricultural soils into town athletic fields and require that such facilities be built on low quality soils and forested sites. Future preference should be given to the east side of town near Jacksonville village where public open space is currently scant.

o. Mandate a state septic permit as part of the local building permit and site plan approval. Although this may seem redundant, local emphasis serves to further ensure local compliance.

p. Establish a local farmer's market. A weekend farmer's market could not only provide economic returns, it could facilitate a community awareness of farming which can lead to greater support of local farms. This could be a rotational effort involving other local communities: Halifax, Heath, Readsboro, Rowe, Colrain, etc. The school parking area and grounds would be an ideal location.

q. Prohibit development on grades of 25% or greater anywhere in town.

Steep grades are subject to greater runoff than shallow grades. Preventing development on steep grades helps reduce erosion and runoff into water resources. Development on steep grades also has the potential to increase future town infrastructure costs and inhibit access by emergency vehicles. Refer to Map 3.

4.2 Town Conservation Commission

The creation of a town conservation commission was indicated as an important goal in the draft town plan (Whitingham, 2010). The following interventions outline the creation of a conservation commission and some reasonable initiatives that it might be tasked with.

In additional to a conservation commission, the town may also want to consider the creation of an agricultural board or hire a part time conservation agent. The cost of hiring a part time conservation agent could be shared with another nearby town (for instance, Readsboro). Alternately, the town could hire a temporary conservation agent for a specific project and pay that person through grants acquired for that purpose.

The purpose of the conservation commission would be to:

- supply the planning and zoning appeals board critical information about regulations and town resources as they review plans and permits
- apply for grants for various resource-related projects and initiatives
- work as an intermediary between local (agricultural and forest) landowners and external sources of funding and support
- maintain and improve data on the town's open space and natural resources

Many of the interventions described below would need the support of a conservation commission in order to move forward. Such interventions ask the conservation commission to go beyond its usual role as an advisory board and engage in proactive initiatives to acquire grants and information, and to work directly with landowners.

a. Track farmland and forestland. The conservation commission would keep track of forested and agricultural property details in order to relieve a conservation buyer or farmer-buyer of having to do the same footwork (often at the last minute), which can be time consuming. Data would include information on owners, profitability, crops, forestry practices, farm structures, condition of lands, natural resources on the property, land enrolled in Use Value Appraisal , aid and technical assistance provided by the state or federal government, etc. The conservation commission would collect information on the condition of farms including the location and function of structures, type of farming, annual profits, farm management techniques employed, historic value, natural resources value, and the presence of waste or farm dumps. The commission would also collect copies of title, existing appraisals, wills, and contact information of interest holders and potential inheritors. Some information would be voluntarily provided by landowners while some of it already exists as public record. Equally important will be the establishment of an ongoing relationship between farmers and the conservation commission (alternately agricultural board or conservation agent). These data would help governmental and non-profit conservation players expedite land conservation initiatives and more quickly and precisely respond to Whitingham's land conservation needs.

b. Bridge the gap between local farms, forestland owners, and support resources. The conservation commission would consult with VLT, Natural Resources Conservation Service, and VANR about sources of funding and technical assistance for *specific* farms and forest land blocks in Whitingham. Local knowledge of farm and forest block conditions will help bridge the

gap between regional resources and farms and forest owners. In turn this will help make farms and forestry practices more profitable, increase regional awareness of local farms, farmers, and forest owners among those groups best able to help, and increase the likelihood of finding farmer-buyers or conservation buyers.

c. Conduct outreach. The conservation commission would conduct outreach to buyers who are about to purchase farmland, forestland, or (in general) land with quality soils. The objectives here will be to establish a relationship, acquire information, and to inform buyers about the land they are buying.

d. Map and prioritize. Maintain a list and map showing those forestland and farmland properties of highest value to the community. Provide this list to VLT, VANR, local real estate agents, and other partners.

e. Read permits. The conservation commission would be required to read and offer an opinion to the permit granting board for all development and subdivision proposals and town bylaw changes that affect important open space and natural resources in town, including agriculture.

f. Encourage enrollment in the Use Value Appraisal program. The conservation commission would provide information about the UVA program through direct outreach.

g. Solicit both binding and non binding access and conservation agreements with willing landowners. Agreements would include, for instance, Right of First Refusal, verbal agreements, temporary recorded access easements, etc.

h. Work to reverse unnecessary subdivision. Work with landowners to aggregate conservation land into 25+ acre parcels for UVA inclusion. Groups of adjacent landowners can "bundle" unused parts of their properties in trusts, HOAs, Co-ops, or conservation easements qualifying them for the UVA tax benefits. The town conservation commission should work with

landowners and other partners towards bundling surplus land, especially where it has been fragmented by "bowling alley" subdivision.

i. Provide an informational brochure on local farms. This need be no more elaborate than a black and white 8-½ x 11 tri-fold. It could be funded by farm owners and farm suppliers and distributed in public places.

j. Educate children about farmland. Appoint someone on the school committee or school staff to work to create farm-to-school educational opportunities.

k. Continue to inventory and prioritize the town's recreational resources, natural, historic, and open space resources. Identify where the most valuable lands are located and prioritize trails and parks projects.

4.3 Critical Resource Overlay Zone

The current draft town plan indicates four town zones: *Village, Rural Residential, Rural,* and *Conservation*. The Conservation Zone is intended to be the most restrictive of the four. However, as outlined in the draft town plan, the Conservation Zone is located on the west side of town only. It is geographically specific but it is not resource specific (Whitingham, 2010). The creation of a Critical Resources Overlay Zone would be more resource specific and less geography specific. It could be superimposed over existing zones and affect those resources determined to have high open space and natural resource value. Higher scrutiny of development would be the rule for such a zone.

The Critical Resources Overlay Zone and the Conservation Zone could handily complement each other. On the other hand, the Conservation Zone could be done away with altogether and replaced with the Critical Resource Overlay Zone. In either case, the

interventions below (crafted for the Critical Resource Overlay Zone) could be selected for application in either zone.

Ideally, such an overlay would encompass all functional farms of five or more acres in size (or contiguous aggregate parcels amounting to the same) and all land with quality soils greater than one half acre in size (contiguous). The overlay would also include the core forest habitat blocks identified in the draft town plan and include various unique natural, recreational, or scenic areas. Village zones would be not be included in the overlay zone (with perhaps the exception of large agricultural blocks that intrude in village zones).

The following interventions could be applied within the zone:

Topography Related Regulations

a. Prohibit development on slopes of greater than 15%. This regulation builds on intervention 4.1.a. Steep grades are subject to greater runoff than shallow grades. Preventing development on steep grades helps reduce erosion and runoff. Development on steep grades also has the potential to increase future town infrastructure costs and inhibit access by emergency vehicles.

b. Prohibit ridge-top or hilltop construction. Development on hills and ridge crests tends to intrude upon the landscape more than development in lower areas; access to these sites is often by very long roads through steep terrain.

Soil Protection Regulations

c. Require construction on poor soils when possible. Where a parcel contains both poor and quality soils, require that buildings to be sited on the poor soils except where other concerns would make it an unreasonable hardship or an impossibility, or where other, more critical natural or open space resources would be impacted. Map 5 shows the prevalence of quality soils in Whitingham.

d. Prohibit "quality soil only" subdivided parcels. Prohibit the subdivision of a parent parcel where one or more child parcels yields no buildable land that is *not* quality soil—unless such "quality soil" parcels are to be put under permanent conservation easement or recorded as undevelopable by deed restriction. In other words, all subdivided parcels *must* have enough poor soil on which to build at least *one* home. Existing subdivided parcels with predominantly quality soil could be grandfathered in for one housing unit or one housing unit per ten acres of parent parcel.

Road Construction Regulations

e. No residential roads through farm fields, quality soil areas, and core forest habitat. Subdivision roads should occur at the edges of fields, soil resource areas, and core forest habitat, not through the center of them. Exceptions for the interference of topography, important natural or open space resources, and hardship could be allowed.

f. No dead-end roads. Prohibit cul-de-sacs and dead-ends. Dead end roads tend to fragment farmland and forestland more easily than through-roads do. Dead ends also tend to increase traffic densities on main roads and increase emergency response times (Stokes et. al., 1997; Norström, 2011). Partial through-roads can be built if future connections are provided for by easement. Village zones and planned unit developments with short access roads could be excluded.

Building Construction Regulations

g. Mandatory "Conservation Development" for housing developments of 3 or more proposed units. So called Conservation Development or Cluster Development would allow housing densities of up to one-fourth acre (or denser) per family unit but would be required to set aside a percentage (40-60%) of land as perpetually eased farmland, garden, or natural open space (lawns and roads excluded). Such development would be mandated in the Critical

Resource Overlay Zone. Here, density compensates for the conservation requirement. Homes would be required to be arranged with minimal impacts to quality soils, existing farmland, historic and natural resources, and should fit in with abutting development to minimize collective impacts. Septic systems could be constructed on the eased portion of land with encouragement to do so in poor soils. See 6.2 for details on the prescriptive review process for conservation developments (Stokes et. al. 1997; Hamin, Geigis & Silka, 2007).

h. Maximum setback. Require *maximum* setbacks for all new homes in the overlay zone that are located on non-state travel routes (homes on Route 100 and Route 116 would be exempt), perhaps a thirty-foot maximum. This reduces the tendency to convert farmland into spacious front lawns and it forces new homes to fit in with the rural historic character of the town (most farms and rural houses were built close to roads).

4.4 Conservation of Water Resources

Water Resource Buffers

Buffers around water resources help protect water quality, wetland wildlife and plant habitat, retain scenic vistas, and help protect traditional recreational access (Stokes et. al, 1997; Benedict & McMahon, 2006). Using GIS analysis, the impact of buffers on the development potential of property parcels was examined for the town of Whitingham. Refer to maps 14-16. Map 14 shows what the loss of developable land per parcel looks like with the *minimum state mandated 50 foot no-build wetland buffer.* Note that the parcels most impacted are small, located in village centers, and already contain houses. For practical reasons, landowners are unlikely to want to subdivide these lots. Reasonable subdivision regulations would also likely forbid the further division of such small lots. Map 15 shows loss of developable land per parcel with a *proposed 100 foot no build wetland buffer.* Also note that the majority of parcels are

unaffected or would see a loss of less than 25% of land to existing wetlands, 50 foot buffers, and proposed 100 foot buffer zones *combined*. Map 16 is most telling: it shows the amount of land available to build houses with existing wetlands regulations and a proposed 100 foot buffers in place. Because the building footprint of most homes takes up an eighth of an acre or less, in most cases the only thing lost to the proposed 100 foot buffers is some flexibility in where the houses may be placed on properties (map data: Windham Regional Commission 2010; United States Fish and Wildlife Service, 2003; Brouillette, 2002). It is important to note that research indicates that optimum water resource buffers are between 200 and 300 feet (Austin et. al, 2004; Semlitsch & Bodie, 2003). The interventions described here suggest 50 to 125 foot buffers.

As suggested above, minimum water resources buffers could include:

a. A fifty-foot *unconditional* no-build buffer around all water resources with existing uses grandfathered in. Building within the buffer area in Village Zoned areas would be allowed as a *conditional use* within 50 feet. This effectively prevents all forms of development within fifty feet of a water resource except in village zoned areas where landowners would have to show hardship or offer some form of mitigation in exchange for building within the buffer. This regulation would be a step up from state-mandated *conditional* no build buffer regulations for Class II water resources.

b. A 100 foot *conditional* no-build buffer around all water resources with existing uses and existing small lots grandfathered in. Village zoned areas would be *exempt* (but subject to the conditional fifty foot buffer described above). In conjunction with the previous intervention (above), this effectively limits all forms of development between fifty and one-hundred feet of a water resource. Within the 50-100 foot buffer, landowners would have to show special

circumstances or offer some form of mitigation in exchange for a permit to build therein. As suggested above, the economic effects of these regulations on landowners would be minimal.

c. An *unconditional* 125 foot no-build buffer around lakes, ponds, the Deerfield River, and wetlands larger than 0.5 acre in size. Lakes and wetlands should be identified in zoning regulations. Currently the town has a 125 foot *conditional* no-build buffer around lakes and ponds. This would increase the protection offered by that measure by making the buffer *unconditional* and extending it to the river and large wetlands.

d. Restrictions on future subdivision of land into wetland-only lots. Future subdivision into lots that do not contain enough land on which to develop (land which is not wetland or wetland buffer) would be recorded as "undevelopable wetland or wetland buffer."

e. Prohibition of development on grades of 15% or greater within 100 feet of a water resource. This regulation would reduce sedimentation, erosion, and non-point source pollution of water resources (Austin, et.al., 2004; Stokes et. al, 1997).

Vegetated Water Resources Buffers

Vegetated water resources buffers enhance the water quality protections established by the no build buffers by retaining vegetation around water resources which can help filter and absorb pollutants, improve habitat quality, and protect scenic shorelines (Stokes et. al., 1997; Welsch, n.d.).

f. Mandate a twenty-five, fifty, or seventy-five foot *vegetated buffer* around all water resources. The vegetated buffer width would be determined by the *no build buffer* (at 50, 100, or 125 feet) and would exist within the larger no-build water resources buffer. It would be *unconditional,* with *clause* allowing for a mowed path and dock for lakes and ponds. Building permits would be required for docks. Building within a vegetated buffer in a Village Zone area would be a *conditional use.* This regulation would preserve natural vegetation, habitat, and

scenic quality of water resources. Existing landscaping could be grandfathered in. Although this would be difficult to enforce, it would be better than no regulation at all. Furthermore, it could be tied to Natural Resources Conservation Service wetlands grants, which offer financial incentives toward the re-vegetation of wetlands buffer areas (Natural Resources Conservation Service, 2011).

g. Encourage agricultural buffer restoration. Natural Resources Conservation Service via the U.S. Farm Bill provides grants for farmers and other landowners to re-vegetate wetland areas (Natural Resources Conservation Service, 2011). The town conservation commission should work with landowners toward this end.

Fill Regulations

h. Prohibit all development within twenty-five feet of an identified one hundred year floodplain or flood hazard area (behind a pond dam for instance) **including development built on backfill.** Federal Emergency Management Agency requirements make it difficult to develop in floodplains (Federal Emergency Management Agency, 2011). However, backfilling to raise the grade out of the flood zone is sometimes used as a way to get around such limitations. This intervention closes that loophole.

i. Allow wetland backfill by a genuine hardship variance *only* and mandatory 1:1 mitigation. Before a local building permit is issued or a site plan is approved, a variance or special permit to backfill a wetland *must be* accompanied by valid state and/or federal permit or it must be shown that no state or federal permit applies. All backfill would require either equal mitigation (new wetland would be created on the property in equal square footage to filled wetland) or by impact fee equivalent to the cost of creating an equal amount of new wetland elsewhere (which would be set aside to exclusively fund town water resources initiatives).

Enhanced Water Resources Protection

The following regulatory devices suggest additional optimum levels of protection:

j. An unconditional 100 foot no-build water resource buffer within the Critical Resource Overlay Zone and (or) the Conservation Zone (see 4.3, above). This would tighten up the buffer restrictions within critical areas.

k. Require *all* new roads to be located more than 100 feet from lakes, ponds, and wetlands greater than one-half acre in size except when building roads closer to these resources would result in a higher net conservation benefit.

4.5 Subdivision Regulations

Subdivision limits how land can be divided and for what purpose. Subdivision in Whitingham should further the purpose of the town plan with regard to open space and natural resources.

a. Require impact fees for all new subdivision road construction. Private roads have a tendency to become a public burden in the future. The town should assess impact fees in order to provide for future maintenance of private roads. The imposition of impact fees may also help to moderate future subdivision growth (Austin, 2004; Stokes, 1997).

b. Restrict future subdivision of wetland lots. See 4.4, above.

c. Prohibit "quality soil only" subdivided parcels. See 4.3, above.

d. Require "reasonable proportionality" of lot subdivision dimensions. For instance, subdivision into lots with lengths exceeding 1.5 times (or some other ratio) the frontage of the lot would not be allowed (unless a hardship applies or a long-lot subdivision favors the conservation of important resources identified by the town). Ideally, small lots of 2.5 acres or less (or some other nominal acreage) would be exempt.

e. Do not over-regulate lot size. Although minimum lot size will vary between established zones, it is important not to fall into the trap of believing that large-lot zoning will protect open space and natural resources. For instance, in response to the former loophole in state septic review, many "bowling alley" ten-plus acre lots were created in town. Vermont Smart Growth has shown that lots in the ten acre range have done little to protect resources (Smart Growth Vermont, n.d.). Research also shows that large lot zoning often prices out less well-to-do landowners and increases the building and landscaping footprint of the average home (Smart Growth Vermont, n.d.; Austin et. al., 2004; Stokes et. al., 1997). Less people on bigger lots mean more habitat and farmland fragmentation. Therefore, it may make more sense for Whitingham to allow for average sized lots in all of its zones and relay on other interventions to protect open space and natural resources. Suggested minimum lot sizes for Whitingham: no more than 2 acres for *any* zone in town; preferably 0.5 acre standard; even smaller lots for village areas and for Conservation Development.

f. Increase minimum lakeshore frontage. Increase the minimum required water frontage for lots on lakes, ponds, and major wetlands to 500 feet. This is an aggressive option useful *only* in conjunction with mandatory vegetated water resources buffers (see 4.4, above).

4.6 Development Review Processes and Requirements

Development review processes and requirements provide the town with a means of evaluating development proposals in terms of their impact on local resources.

a. Require site plan review for all subdivision and development over three residential housing units, all commercial and industrial development (except home occupations and small businesses below a minimum square footage threshold), and any miscellaneous development (development that does not fit into one of the previously mentioned categories). Mandatory site

plan review would allow the town to both qualitatively and quantitatively evaluate new development projects. Each new development would require a preliminary and a final site plan. Site plans would be reviewed and approved by the Planning Commission. Input from appropriate town boards and commissions would be mandatory.

The following materials would be required for Site Plans:

- Proof of any required state and federal permits; provision in the site plan that shows compliance with applicable local, state, and federal regulations.
- A Forest Stand Delineation Inventory (FSDI). Simply put, an FSDI is an inventory of forest resources. It includes maps showing extent of forest coverage; documentation of forest plant and tree species mix; presence of historic, old growth, or champion trees on the property; evidence of mast stands or deer wintering areas; presence of endangered, threatened or special concern species; previous forestry plans and timber harvests; sugarbush potential; regional context in relation to core forest habitat areas; and general forest type coverage (Maryland Department of Natural Resources, n.d.). Documentation: small acreage developments may rely on existing state and local inventories. Larger developments will have to hire a forester or similar professional.
- A Historic Resources Inventory. Location of any registered state, federal, or local documented historically significant building or site; location of any site, building, structure, or stone wall over 80 years old; location of historic trees or champion trees. Documentation: state, federal, and local sources.
- The location of wetlands, water bodies, floodplain, and water courses. Documentation: federal, state and local maps and visual survey.
- The location of slopes over 15%; location of slopes over 25%. Documentation: federal, state and local maps.

- The location of trails and other recreational systems within 1,000 feet of the tract (public or private). Documentation: state and local maps; visual survey, town plan.
- An agricultural inventory showing quality soil areas and any known farming (including hay, pasture, orchard, and tree farms) active within the last 15 years. Documentation: state, federal, and local maps; visual survey.
- A species inventory documenting any endangered, threatened, or special concern species. Documentation: small developments and developments in the village center may use the best available existing state and federal resource inventories and maps to document species. Larger developments will have to hire professionals to conduct inventories.
- The location of any road wildlife crossings identified in town plan maps. Documentation: local planning maps.
- The location of any scenic vistas or unique resources identified in town plans and maps. Documentation: local plans and maps.
- A Stormwater Management Plan equal to state stormwater management guidelines. State stormwater permits may also be required.
- A map showing location of roads, houses, utilities, etc.
- A Rural Conservation Plan (RCP) required for all areas except the Village Zone (see 4.6.b., below).
- A Village Conservation Plan (VCP) required for the Village Zone. This plan would address concerns related to compatibility within the village center. Although the details of such a site plan are beyond the scope of this project, elements related to open space and natural resources should probably be included. For instance: integration of town recreational planning for parks and trails; historic preservation and visual compatibility

of architectural styles; mandatory wetlands protections for village zones; landscaping standards; and street tree plantings.

b. Require a Rural Conservation Plan within the Critical Resources Overlay Zone (RCP). A RCP demonstrates how the developer plans to protect the resources within the Critical Resources Overlay Zone or the Conservation Zone. The following are flexible guidelines for the developer; the site plan would be evaluated qualitatively on how well the developer makes provisions for the following:

- All of the materials indicated in 4.6.a., above.
- Retention of forest cover, natural open land, recreational land, and agricultural land: Suggested 70% retention in the Rural and Rural Residential zones; mandatory 70% retention for Conservation and Overlay Zones. 70% of the land should be retained as forest, natural open space, public or homeowner's association (HOA) managed recreational open space, or agricultural land. Private boundary strip areas narrower than one hundred feet and lawns would not be included. Restrictive covenants protecting the retention of these lands may be required of larger development projects. Lower thresholds may be adopted for industrial and commercial development not associated with accommodations developments (hotels, resorts, etc.).
- Priorities for forest cover retention. The following resources should be given high priority for forest cover retention: water resource buffers; floodplain; existing and proposed recreational resources; one hundred foot or greater corridors around existing and proposed trails; forest that is adjacent to or part of a greater area of undisturbed contiguous forest habitat; areas containing or adjacent to unique natural, scenic, or ecological resources; slopes of 15% or steeper; areas containing or within 200 feet of

agricultural land; historic areas; areas adjacent to existing protected conservation land; quality soils (Austin et. al., 2003; Stokes et. al., 1997).

c. Mandatory Conservation Development (Cluster Development) for Conservation Zone and Overlay Zone. If mandatory conservation development is required for the Conservation Zone or Overlay Zone, the following requirements would apply:

- 40% to 60% of the net tract to be developed would need to be set aside as permanently protected public or HOA (common ownership) open space.
- 70% forest cover retention required. Forest cover may be substituted for agricultural land if long term management covenants are put in place to ensure the continued agricultural use of such land. Otherwise, on a site than lacks 70% forest coverage before ground-breaking, the developer must afforest the site. Afforestation means that, where there was originally less than 70% cover, a developer must plant trees to reach that threshold. If the developer cuts trees to make room for development, he may also have to reforest the site. Reforestation means that, where the developer has cleared trees resulting in less than 70% remaining tree cover, the developer must plant trees to return the property to the 70% threshold. Trees cut below the 70% threshold would be reforested at a rate of 2:1 acres cut. Any trees cleared above the 70% threshold would also be required to be reforested but only at a ratio of 0.25:1 acres cut.
- Recreational open space (40-60%) or forest cover (70%) must be concentrated or interconnected as much as possible.
- Priorities for retention as above in 4.6.b. with focus on forest and agricultural conservation.

4.7 Long Term Open Space and Recreation Plan

State, federal, and non-profit sources of grants for trails, land acquisition, and other conservation projects are *strongly* biased towards towns which have a) identified and prioritized their most valuable conservation land and most desired recreational projects; b) have planned their conservation and recreational goals to fit in with the overall regional open space and recreation context; c) show *connectivity*—in terms of protected landscapes and trail projects—with neighboring towns and regional areas; and d) show long term goals for trail and open space connectivity (Auston, 2003; Stokes, 1997; Vermont Department of Forests, Parks and Recreation, 2005; Vermont Land Trust, n.d.). The interventions below are intended to maximize the town's potential to receive grants and other forms of assistance. Ideally, a town conservation commission would oversee much of this planning.

a. Continue to inventory and prioritize the town's recreational resources, natural, historic, and open space resources. Identify where the most valuable lands are located and prioritize trails and parks projects. Review every five years.

b. Support existing regional trail networks. Existing regional networks include the Catamount Trail, the town's network of snowmobile trails, and the Deerfield River and Reservoirs (a water trail). Refer to Map 9. As a primary north-south trail corridor, Whitingham can serve as a regional snowmobile hub (see Map 13). Businesses in town village cores stand to benefit from the use of snowmobile routes. Like snowmobiling, the long distance Catamount Trail has the potential to bring economic opportunities to town. The following interventions are suggested:

- Establish parking areas and signage. Expand snowmobile parking by establishing weekend parking areas at the school (where there is trail access) for trailers. The town may also wish to clear a parking area at the town transfer station or another central

location in the future. The town should also work to acquire parking areas for the Catamount Trail. These efforts can be funded through cooperation with the CTA and the Deerfield River Watershed Association, through trail grant programs, and through economic development grants. Parking areas should be identified by obvious signage. There should also be signage at major road intersections.

- Ensure compatibility and resource protection. Where snowmobile routes coincide with other potential trail corridors or fragile natural resources, the town should work with trail maintainers and clubs to facilitate multiple uses and protect resources. Certain delicate places—such as the floating island on Sadawga Pond—should be clearly off limits to snowmobiles.
- Work to protect regional trail routes. Catamount and snowmobile routes and access points should be included in the town's inventory of resources in need of protection.
- Construct a direct southern access route to the Catamount Trail. This would include access to the historic lime works east of Sherman Reservoir, and further south the Rowe State Forest in Massachusetts. Access could be had from Lone Pine Road at the power line right of way with additional access via the terminus of Lone Pine Road (which exists as an unmaintained trail in Massachusetts). A small parking lot should be acquired at one of these places. An existing snowmobile route in the area may be used as the new trail route or other routes may be established. Work would be funded directly by Trans-Canada or through grants and volunteer labor.
- Advocate for access through the decommissioned Yankee nuclear plant area. The old railroad bed the Catamount Trail follows on the east side of Sherman Reservoir continues south into Massachusetts along the Deerfield River through the property of the former plant. This is a natural extension of the Catamount Trail route which could

link the Catamount Trail to the long distance Mahican Trail in Massachusetts. At this point the plant has been removed and the site has been cleaned; however, the Nuclear Regulatory Commission has not yet facilitated the removal of storage containers that encase spent low-level radioactive materials (Yankee Rowe, n.d.). When this happens, the fate of the property will been determined by the utility owner. Whitingham (in cooperation with abutting towns, state agencies, and non-profits) should indicate a strong interest in seeing this land enter the public domain. The town should actively support this expansion of the Catamount Trail along this route by letter of support and cooperation with local and regional partners.

- Through letter of support and cooperation with local and regional partners, Whitingham should move to relocate the Catamount Trail off Route 100.

c. Create a long-term hiking and multi-use trail network plan and implement it in stages. The creation of networks of hiking trails and multi-use trails encourage local economic development and put Whitingham "on the map" via inclusion in outdoor guides, journals, and newspapers. Well-signed parking areas attract passers by and encourage visitation. A trail plan would identify where trails are most needed and wanted, and prioritize the creation of these trails. Such a plan would also seek to relate trails to other trail systems in abutting towns and to regional trail systems, and it would seek to relate hiking trails to important natural and scenic resources. Trails should be promoted on both public land and private land (where land owners are willing to cooperate). Note that the state has a program for recognizing trails and trails systems for the purpose of protecting landowners from liability. A number of grant programs described under Vermont Trails and Greenways Council and the Statewide Comprehensive Outdoor Recreation Plan (SCORP) are available for trail development. Some of these grants cover up to 90% of trail building costs (Vermont Department of Forests, Parks and Recreation,

2005; Gibson, 2005). State and regional agencies as well as non-profit groups could contribute technical assistance and labor. In kind volunteer labor and locally donated materials can be used to supply the balance.

Trail Planning Examples

The following are examples of trail planning for the town of Whitingham; refer to Maps 17 through 20. "Low-hanging fruit" consist of trails that would be fairly easy to construct and acquire routes for because the trailway already exist in some form and would pass primarily through public land or existing easements. "Farm trails" could be arranged as part of a broader initiative to protect and promote local farmland. Where farmers are amenable, some farms may be ideal for the construction of recreational foot or equestrian paths along field borders. Trails could be closed during periods of intensive agricultural work. "Unique Resources Trails" would target trail construction through agreement or easement across private land to some of Whitingham's unique scenic and natural areas not in the public domain. These would require active negotiation and conservation programs. "Supporting trails" would be part of a very long term connectivity vision. These routes would have a lower conservation priority; they would be constructed if the land on which they are proposed falls into conservation or a local group or landowner takes the initiative to construct them. More importantly, "supporting trails" help complete the necessary connectivity vision that supports the town's ability to apply for grants for short term projects. Whether they are eventually built or not is of secondary concern.

Examples of "Low Hanging Fruit" (Map 17) might include:

- An official (marked, signed, and maintained) trail to the Green Mountain Giant Boulder at Atherton Meadows.
- A trail to the southern terminus of the Catamount Trail via Lone Pine Road on Trans Canada land.

- A "Readsboro Cutoff" connecting Harriman Reservoir and Sherman Reservoir directly.
- "Head of Meadows Trail," a refurbishing of the unimproved section of the discontinued Head of Meadows Road to be used as a trail.
- "Sadawga Neighborhood Path," a short trail extending from Sadawga Cemetery to Sadawga Pond along a brook, possible through a land swap involving the exchange of substandard municipal land adjacent to the town cemetery for an easement on private land.
- "Jacksonville Neighborhood Path," a short trail along Jacksonville Brook Ravine behind the Jacksonville Cemetery.
- "East Side Trail," an official trail along the east side of Harriman Reservoir. Funding for this trail may be possible through Trans-Canada grants.

Examples of "Farm Trails" (Map 18) could include a "Corse and Morse Farm Trail" linking the Corse Farm, Sportsman's Club, Whitingham School, and Morse Farm. Other trails would loop around the border of large farm fields.

"Unique Resources Trails" (Map 19) could provide access to Sprague Brook and Sprague Falls, the west side of Clara Lake, the former Burrington Hill Ski Area, Hosley Hill overlooking Jacksonville village, and historic Holbrook Mill Pond.

"Supporting Trails" (Map 20) would represent the maximum potential for trail building in the town many decades in the future. They are not necessarily *expected* outcomes, and they are obviously subject to modification as conditions change. Actual "trail buildout" would likely be much less dense. Nonetheless, such plans are useful because they provide justification of financial support from state agencies and non-profits. They also help non-profits and state agencies identify where land acquisition is most important to the people of Whitingham.

Furthermore, they help justify financial support for trail funding on other nearby properties by identifying future potential for regional connectivity.

d. Identify and support bicycling routes and trails. The following planning activities would help put Whitingham "on the map" with regard to bike touring.

- Identify and map on-road bicycle routes. Work with bicycle tour groups, clubs, and transportation agencies to identify scenic routes through town. Make up a simple tri-fold black and white map showing the routes.
- Plan a Deerfield River Bike Path. Support the conversion of the old rail bed along the Catamount Trail into a multi-use hike-ski-bike trail. This would most effectively happen through a partnership with Readsboro and Rowe (in the case the former Yankee Rowe nuclear plant lands become available) as well as the state, CTA, Deerfield River Watershed Association, Trans-Canada, VLT, and other partners. It could be funded through U.S. Department of Transportation and other grants. It would begin with the conservation commission working to contact local, state, and regional partners in support of the idea.
- Encourage the expansion of shoulders along state highway 100 through town. The town would advocate with the state for such work. Wide shoulders could be marked as bike lanes. Bike route signage could be posted.
- Plan a North River Bike Path. Old cart paths and floodplain along the river in south Jacksonville, and low density development make this an ideal place for a bike path. The partners here would be the towns of Halifax, Vermont and Colrain, Massachusetts, Vermont state agencies, the Franklin Land Trust, VLT, and others.

e. Support boat and pedestrian access to water bodies. The following practices and initiatives will help improve recreational access to water resources for both town residents and visitors alike.

- Identify the best access points to water bodies and include them in the town's inventory of resources in need of protection.
- Provide adequate parking for car-top boating at smaller ponds. North Pond, Shippee Pond, and Laurel Lake are virtually inaccessible and are located on private property. The town should place a high priority on acquiring easements to these resources from willing landowners. Ryder Pond, Jacksonville Pond, and Gates Pond are located on private property but abut town roads. The town should place high priority on acquiring access easements and plan on the future widening of roads to allow for limited roadside parking where such expansion does not threaten water quality. Clara Lake and Jacksonville Pond, small and shallow, are not conducive to boating but should have foot access to shorelines for fishing and walking. Because excessive boat access would likely threaten their ecology, it is important to discourage overuse of these small ponds by available parking and access. In all cases, the town should consult the Vermont Agency of Natural Resources to determine the appropriate amount of parking.
- Support a preliminary study to identify potential locations and costs of installing a boat ramp parking area at Harriman Reservoir. The Harriman Reservoir boat ramp on Brickhouse Road has virtually no public parking. Trans-Canada land in this area is a narrow strip along the reservoir surrounded by steep terrain. Because the topography surrounding the Harriman Reservoir is generally as steep, the construction of a parking lot and boat ramp somewhere else near the center of Whitingham would likely be very expensive. An access ramp further north at the end of Ick Road or Faulkner Road would

make little sense as these roads are lengthy, narrow, and unpaved. Trans-Canada would more likely expand its picnic area just to the north in Wilmington instead. The paved road to Harriman Dam is also very narrow and steep sided. A wider road, terminal boat ramp, and parking lot would have to be blasted out of the rock. As there are no inexpensive options, the town will have to decide whether or not it makes economic sense to invest in access and weigh this expense against its other planning goals. There may be some possibility for widening Route 100 through United States Department of Transportation related grants to allow for more parallel parking. However, even this option is limited due to the proximity of houses along the south side of Route 100 and steep banks on its north side. In the end, if the town believes a parking area for boat trailers at Harriman is important, the first step would be to generate a professional study of potential locations and costs. This should be done in cooperation with Trans-Canada and VLT.

- Establish a town swimming area. The most likely place for a swimming beach in town would be at Harriman Reservoir. Sadawga Pond might be a possibility, but it would have to be determined if the creation of a beach is environmentally responsible, and the town (or state) would have to acquire land for the beach. At Harriman Reservoir the difficulties of establishing a beach would be similar to the difficulties of establishing access for boat trailers. Nonetheless it would be worthwhile to work with Trans Canada to study possibilities for a small beach somewhere on the south side of the reservoir where there is existing parking. Locating a beach at the end of Ick Road or Faulkner Road is also a possibility; however, this would put the beach far from the most inhabited parts of Whitingham and even further from Jacksonville, as well as increase traffic on long and narrow gravel roads.

f. Protect traditional hunting and fishing opportunities. Hunting and fishing access is closely tied to the permissiveness of landowners. Its long term viability depends largely on keeping large forest blocks unfragmented, water access open, and water habitat protected. Protection strategies for wetlands, farmland, and forest habitat should therefore be encouraged:

- Identify fishing access points and important hunting habitat and include them in the town's inventory of resources in need of protection.
- Support interventions that protect agriculture, forestland, and water resources. See the other interventions in this report for details.
- Support interventions that limit the parcelization of land. See the other interventions in this report for details, particularly the subdivision interventions.

g. Create community parks and prepare for future athletic field needs. See 4.1.

h. Protect scenic vistas, scenic landscapes, and unique resources. Scenic vistas and landscapes are best protected via a variety of methods that reduce the fragmentation of farmland in particular. Other scenic landscapes include wooded Hosley Hill as seen from Jacksonville center, and various unique resources including waterfalls and ponds. Unique resources should be given high conservation priority. See Map 9.

- Identify scenic landscapes and include them in the town's inventory of resources in need of protection. The town conservation commission should maintain an inventory of scenic areas in need of protection.
- Work to protect farmland**.** This topic has been discussed in great detail in previous sections.
- Prohibit steep slopes and hilltop development. Steep slope and hilltop development tends to intrude upon the landscape more than development on more moderate slopes.

Preventing development on steep grades also helps reduce erosion and runoff. This topic has been discussed in detail in previous sections.

i. Create comprehensive recreational maps. Perhaps the easiest way of creating and distributing recreation and open space maps is by modifying corresponding town planning maps for a general audience and making them available for download and home printing via the town's website or the Windham Regional Commission website. Indeed, some planning maps area already available via Windham Regional Commission's website. Simple black-and-white tri-fold maps showing key locations, with brief text descriptions on the reverse, are another easy and inexpensive way of distributing information about town recreational and open space resources. There are several ways of funding the production of such maps. Various trail grant programs (already mentioned) are one possibility. Another is to have local businesses underwrite the cost in exchange for advertisements on the map itself. Local snowmobile clubs have effectively used this method in the production of their maps. It should be kept in mind that maps are sources of advertising for the town itself and can be offered at places that distribute local and regional brochures.

4.8 Miscellaneous interventions

These proactive interventions can be used to supplement any of the comprehensive interventions listed above; many of them can also exist as stand-alone devices. Some of them are stronger versions of the interventions suggested above while others simply did not fit into any of the above categories.

a. Clean up farm dumps. Encourage farmers to clean up farm dumps and other junk. Potential buyers of farms or conservation easements on farms may balk at purchasing farms with unresolved on site dumps and junk. Inventory farm dumps and allow farmers to eliminate

these at low cost through the local transfer station. The Vermont Department of Environmental Conservation offers some grant programs that may be applicable for cleanup up of farm dumps. This would be a conservation commission initiative.

b. Levy impact fees for quality soil removal. Require an impact fee when significant amounts of quality soil (2,000+ square feet at surface, for instance) are disturbed for construction. The rate of fee would be some fraction of the agricultural value of the land disturbed. The fee would go into a fund dedicated to farmland and soil conservation. The fee could be waived for small properties where there is little land available for construction.

c. Support the creation of farm-to-school community gardens. Locate a community garden on town or non-profit owned land. Students could use the gardens to learn about agriculture in cooperation with local farmers who can supply guidance and loan equipment. Produce grown at the garden could be used to supplement school lunches. This would be a conservation commission initiative.

d. Encourage farm tourism by allowing by right two room bed and breakfast operations at farms in town. Eliminate, as far as possible, regulations and taxes that would impede such entrepreneurialism. Allow accessory dwelling units to be constructed for such purposes. Allow B&B's and farm stands by right throughout the town. Promote such establishments in a farm brochure.

e. Require all new housing development over two residential units, all industrial development, and all commercial development with impacts over 2,500 square feet of building footprint to meet or exceed state storm water mitigation standards. This intervention expands the state stormwater minimum threshold to include more types of development.

f. Mandate Integrated Stormwater Management. Require all retention ponds and significant modifications of wetland areas to be landscaped as per the *Vermont Stormwater*

Management Manual, Volume 2, "Integrated Stormwater Management" guidelines (Vermont Agency of Natural Resources, 2002b). Native re-vegetation and mimicry of local topography and drainage patterns should be required. Again, this builds upon existing regulation, requiring the best management practices available.

g. Require natural landscaping for grading near water resources. Where land is graded for parking lots and buildings within 100 feet of a water resource, require natural landscaping methods (as opposed to non-vegetated gravel inclines and stone riprap, for instance). This would complement water buffer regulations by providing additional protection of resources where variances and conditional permits are granted.

h. Work with landowners to create forest products cooperatives. Landowners can pool their resources in order to pay for the creation of forest management plans, negotiate logging contracts, or purchase special equipment (for maple sugaring, for instance). Where small parcels of less than fifty acres would not in of themselves support commercial forestry, several nearby parcels with collectively more than fifty acres might be commercially viable if managed as one unit. This would be a conservation commission initiative.

i. Protect and improve town gateways. Gateways—those parts of town that are near the border of other towns along well-traveled roads—are important introductions to the town. It is not important that the gateways be located exactly on the border—but they should ideally be located at an attractive location near the border. Such "first impressions" can help visitors feel welcome within the community and increase the likelihood they will want to do business there. Efforts should be made to make these areas attractive as possible. In Whitingham, these areas include both ends of Route 100 at the Wilmington and Readsboro town borders; Route 8A at the Massachusetts border, and Route 116 at the Halifax border. Gateways should include welcoming signs and a small information kiosk with a town map and other materials. In

Whitingham, these areas are rural; they should therefore be included in the town's inventory of important scenic resource lands worthy of protection. Ideal locations for kiosks would be Route 100 at Ryder Pond (near the Wilmington border); opposite the westernmost Atherton Meadows parking lot (just east of the Readsboro border); at the corner of Chapel Hill Road and Route 8A (at the Heath border, where there are expansive views from roadside fields), and next to the North River near the Halifax border on Route 116. Economic development grants could be used to pay for some of these improvements.

j. Road building moratorium in the Conservation Zone, Overlay Zone, and possibly the Rural zone. A fifteen-year moratorium on road building in these zones will help concentrate future development projects in areas best suited to receive it. Exceptions could be made for low-impact conservation development.

CONCLUSION

The goals of the current draft town plan could support any of the interventions outlined above. While not all of these interventions would be easy to implement, each can be seen as a positive step toward the conservation of Whitingham's important open space and natural resources. As some of the easy steps are introduced and followed through, perhaps the people of Whitingham will feel encouraged to move forward with more difficult planning goals.

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MAP PORTFOLIO CITATIONS

Unless otherwise noted, all maps were created by the author in 2010. Base map material was retrieved from the Vermont Center for Geographic Information and from MassGIS in 2010. Where the author of this project was also the map author, GIS datasets significant to each map (data beyond base map material) are cited below.

MAP 1: WHITINGHAM, VERMONT
Map source: Whitingham, 2010.

MAP 2: RECREATIONAL CONNECTIVITY (1)
Data: Dudley, J.B., 1993; Massachusetts Department of Conservation and Recreation, 1999; Massachusetts Office of Geographic Information, 2009; Massachusetts Executive Office of Transportation, 2001; University of Vermont, 2009; Whitingham, 2010; Windham Regional Commission, 2009a, 2009c.

MAP 3: STEEP SLOPES
Map source: Whitingham, 2010.

MAP 4: FORESTLAND & HABITAT
Data: Massachusetts Department of Conservation and Recreation, 2009; Massachusetts Department of Fish and Game, 2003a, 2003b, 2006, 2008a, 2008b; United States Fish and Wildlife Service, 2003; University of Massachusetts, 2010; Vermont Agency of Natural Resources, n.d.; Vermont Department of Fish and Wildlife, 2006; Whitingham, 2010.

MAP 5: EXTENT OF AGRICULTURE & QUALITY SOIL
Data: Natural Resources Conservation Service, 2009; Sanborn Total Geospatial Solutions, 2005; United States Geologic Survey, 2003; Windham Regional Commission, 2009b, 2009c.

MAP 6: PROTECTION, QUALITY SOILS & UNPROTECTED FARMLAND
Data: Natural Resources Conservation Service, 2009; University of Vermont, 2009; Windham Regional Commission, 2009b, 2009c.

MAP 7: WATER RESOURCES
Data: Federal Emergency Management Agency, 2008; Massachusetts Department of Environmental Protection, 2010; United States Fish and Wildlife Service, 2003; University of Vermont, 2009; Vermont Agency of Natural Resources , 2009; Whitingham, 2010.

MAP 8: EASEMENTS, PUBLIC LAND & NON-PROFIT LAND
Data: Massachusetts Office of Geographic Information, 2009; University of Vermont, 2009; Windham Regional Commission, 2009c.

MAP 9: RECREATION RESOURCES
Data: Dudley, J.B., 1993; United States Fish and Wildlife Service, 2003; University of Vermont, 2009; Whitingham, 2010; Windham Regional Commission, 2009a, 2009c.

MAP 10: OUT OF TOWN OWNERSHIP
Data: Windham Regional Commission, 2010.

MAP 11: ECOLOGY & HABITAT
Data: Data: Massachusetts Department of Conservation and Recreation, 2009; Massachusetts Department of Fish and Game, 2003a, 2003b, 2006, 2008a, 2008b; United States Fish and Wildlife Service, 2003; University of Massachusetts, 2010; Vermont Agency of Natural Resources, n.d.; Vermont Department of Fish and Wildlife, 2006; Whitingham, 2010.

MAP 12: REGIONAL & LOCAL HABITAT CONNECTIVITY
Data: Data: Massachusetts Department of Conservation and Recreation, 2009; Massachusetts Department of Fish and Game, 2003a, 2003b, 2006, 2008a, 2008b; United States Fish and Wildlife Service, 2003; University of Massachusetts, 2010; Vermont Agency of Natural Resources, n.d.; Vermont Department of Fish and Wildlife (2006); Whitingham, 2010.

MAP 13: RECREATIONAL CONNECTIVITY (2)
Data: Dudley, J.B., 1993; Massachusetts Department of Conservation and Recreation, 1999; Massachusetts Office of Geographic Information, 2009; Massachusetts Executive Office of Transportation, 2001; University of Vermont, 2009; Whitingham, 2010; Windham Regional Commission, 2009a, 2009c.

MAP 14: IMPACTS OF WATER REGULATION ON PARCELS—WATER, WETLANDS, AND FLOODZONES, UNBUFFERED
Data: United States Fish and Wildlife Service, 2003; Windham Regional Commission, 2010.

MAP 15: IMPACTS OF WATER REGULATION ON PARCELS—WATER, WETLANDS, AND FLOODZONES, BUFFERED AT 50 FEET
Data: United States Fish and Wildlife Service, 2003; Windham Regional Commission, 2010.

MAP 16: IMPACTS OF WATER REGULATION ON PARCELS—WATER, WETLANDS, AND FLOODZONES, BUFFERED AT 100 FEET
Data: United States Fish and Wildlife Service, 2003; Windham Regional Commission, 2010.

MAP 17: TRAIL PLANNING: "LOW HANGING FRUIT"
Data: Ground surveys by author.

MAP 18: TRAIL PLANNING: EXAMPLES OF FARM TRAILS
Data: Ground surveys by author.

MAP 19: TRAIL PLANNING: EXAMPLE UNIQUE RESOURCES TRAILS
Data: Ground surveys by author.

MAP 20: TRAIL PLANNING: EXAMPLE CONNECTING TRAILS
Data: Ground surveys by author.