

State of Vermont
Agency of Natural Resources
Department of Fish & Wildlife
Department of Forests, Parks and Recreation

Long Range Management Plan GALE MEADOWS WILDLIFE MANAGEMENT AREA



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**Long Range Management Plan
Gale Meadows WMA
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I. INTRODUCTION

Overview of Wildlife Management Areas Vermont Agency of Natural Resources

On behalf of the State of Vermont and the Agency of Natural Resources, the Department of Fish and Wildlife manages state-owned Wildlife Management Areas (WMAs) for a variety of purposes, ranging from the protection of important natural resources to public uses of the land in appropriate places.

Management and Administration of Wildlife Management Areas



The Department of Fish and Wildlife administers and manages Wildlife Management Areas throughout Vermont. The administration and management of WMAs is funded predominantly through the Federal Aid in Wildlife Restoration Program. This program was initiated in 1937 as the Federal Aid in Wildlife Restoration Act in which taxes are paid on firearms, ammunition and archery equipment by the public. Today this excise tax generates over a hundred million dollars each year that is dedicated to state wildlife restoration and management projects across the United States. These excise tax dollars, coupled with state hunting license fees have been the predominate sources of funding for the management of state Wildlife Management Areas.

Natural Resources include, but are not limited to: the land, air, and waters of the State of Vermont and those fish, wildlife, plants, other life forms, habitats, natural communities, and ecosystems within biophysical regions of Vermont.

Public Uses on Wildlife Management Areas include wildlife dependent activities, not limited to: hunting, fishing, trapping, hiking, wildlife viewing, research, and education.

Outcome of Long Range Management Plans

The Vermont Agency of Natural Resources through its departments, manages state lands in a sustainable manner by considering all aspects of the ecosystem and all uses of the natural resources. (Agency Strategic Plan 2001-2005)

The Agency has a mandate to serve as the principal land steward for properties owned or managed by its three departments—Environmental Conservation; Fish and Wildlife; and Forests, Parks, and Recreation.

The development of long range management plans (LRMP) for state lands represents a key step in providing responsible stewardship of these valued public assets. Each LRMP identifies areas where different uses are to be allowed and describes how these uses will be managed to ensure protection of natural resources. The following management considerations further both Agency and Department missions and are evaluated during the development of long range management plans for all ANR lands:

Biological Diversity, Abundance, and Distribution: Wildlife Management Area lands are managed to maintain, restore, and control the variety (or diversity), number (or abundance), and distribution of plants, fish and wildlife, and other life forms within natural habitats, communities, ecosystems, and biophysical regions.

WMAs are managed to restore, maintain, and control the abundance of certain species of plants, fish and wildlife, and other life forms within bounds that prevent damage or loss of resource value that can result from: high or “over” abundance; low abundance or extirpation of species or genetic stocks; and frequent and/or large fluctuations in abundance through time.

Ecosystem Health: Management of Agency lands to control diversity, abundance, and distribution of plants, animals, and other life forms considers ecosystem functions, health, and integrity.

Legal Constraints: Agency lands are managed in accordance with the purposes for which they were acquired. Many Agency lands were purchased with federal funds that require management for specific purposes. These legal requirements are followed during planning, management, and public use of Agency lands.

Principles of Natural Resource Management: The procedure for making management decisions on Agency lands includes comprehensive survey and assessment of natural resources, and determination of management objectives, evaluation to determine appropriate actions and determination and implementation of various management practices. This procedure is repeated periodically in response to natural resource conditions and uses through time.

Principles of Wildlife Management: Wildlife management activities are directed toward managing the diversity, abundance, and distribution of plants, animals, and other life forms. These activities are designed either to sustain or alter physical, chemical, and/or biological conditions to create, protect, or enhance specific habitat types. Species, habitats, and ecosystems where there is special conservation or public concern, are targeted for management.

Recreational Uses and Needs: Wildlife Management Area lands are managed to create, maintain, and enhance fish and wildlife dependent activities that are consistent with legal constraints and that do not threaten the overall value and sustainability of the natural resources. Recreational uses that have been conducted on the properties prior to Department ownership may be allowed to continue if they do not degrade the habitat or natural resources.

Wildlife Habitat Management: Management practices are used to ensure that trees, shrubs, and other plants are established, promulgated or controlled to establish and maintain the diversity, abundance, distribution, and seral successional patterns characteristic of a healthy forest ecosystem. Wildlife Management Area lands are managed to provide for various habitat requirements for selected species. To obtain desired wildlife habitat age class and species composition, forested habitat may be managed using commercial timber sales or non-commercial management. Revenues generated from any commercial timber sale go back into the management of Wildlife Management Areas. Wetland habitats may be manipulated through a variety of techniques for selected wetland water regimes or for various moist soil management regimes.

Public Involvement: State lands are a public resource. The public is involved in a variety of decisions on state lands, including acquisition, policy development, management planning, and the implementation of policies, plans, and regulations. In developing long range plans, the Agency considers interests outlined in local, regional, and state plans, including town plans, regional plans, watershed plans, and species recovery and management plans. The Agency works to resolve conflicts between plans as may be appropriate or necessary.

Historical/Cultural and Scenic Values: Agency lands are managed in a manner that is sensitive to historical, cultural, and scenic values. Archaeological and historical sites are protected under State and Federal Law equal in status to other legal constraints.

Best Management Practices: A variety of Best or Acceptable Management Practices are applied to State lands. Agency lands are intended to serve as exemplary stewardship models for the public and private sectors of Vermont. Whenever possible, Best Management Practices are made visible and understandable to educate the public concerning their use and benefits.

Regional Availability of Resources and Activities: Department of Fish and Wildlife Wildlife Management Areas are managed for wildlife habitat values and to provide wildlife dependent activities (e.g. regulated hunting, fishing, trapping, wildlife viewing). The Agency works to ensure that additional uses and activities the public might desire (e.g. additional recreation, historical or cultural activities) are made available on a regional basis.

Mission Statements Which Have Guided the Development of This Plan

Vermont Agency of Natural Resources

The mission of the Agency of Natural Resources is "to protect, sustain, and enhance Vermont's natural resources, for the benefit of this and future generations." (Agency Strategic Plan, 2001-2005)

Four agency goals address the following:

- To promote the sustainable use of Vermont's natural resources;
- To protect and improve the health of Vermont's people and ecosystems;
- To promote sustainable outdoor recreation; and
- To operate efficiently and effectively to fulfill our mission.

Department Mission Statements

Vermont Department of Environmental Conservation Mission Statement — 2001-2005

To preserve, enhance, restore, and conserve Vermont's natural resources, and protect human health, for the benefit of this and future generations.

Vermont Department of Fish and Wildlife Mission Statement — 2001-2005

The mission of the Vermont Fish and Wildlife Department is the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont. To accomplish this mission, the integrity, diversity, and vitality of their natural systems must be protected.

Vermont Department of Forests, Parks and Recreation Mission Statement — 2001-2005

The mission of the Department of Forests, Parks, and Recreation is to practice and encourage high quality stewardship of Vermont's environment by monitoring and maintaining the health, integrity, and diversity of important species, natural communities, and ecological processes; managing forests for sustainable use; providing and promoting opportunities for compatible outdoor recreation; and furnishing related information, education, and services.

II. Parcel Description

A. Location/Size Information with Maps

The 707-acre Gale Meadows Wildlife Management Area (WMA) comprises the 195-acre Gale Meadows Pond and 512 surrounding acres of wetlands and uplands. The WMA is located in two towns within two counties in southern Vermont. Two parcels totaling 701± acres (195 of which are submerged) are located within the town of Winhall in Bennington County. In Londonderry (Windham County) at the end of Gale Meadows Road (off Haven Hill Road), are an additional 6± acres that includes the public access area for Gale Meadows Pond. The Winhall Hollow Road bisects the northwesterly portion of the property (Figure 1).

One of the parcels in the Town of Winhall is the Ford Lot, a separate 32-acre parcel that was conveyed to the State as a gift in 1969. It is incorporated into the management plan for Gale Meadows WMA.

The highest elevation on the Gale Meadows WMA is 1,465 feet above sea level with the lowest being the high water mark of the pond at 1,335 feet. The parcel is entirely within the Southern Green Mountain Biophysical Region (Figure 2) which has an influence on the climate and vegetation of the area. Mill Brook is a permanent stream that flows into Gale Meadows Pond from the western side of the property, and exits at the easterly-most side at the dam (See Appendix A for Topographical, Orthophoto, and Tax Maps).

B. Natural Resource Highlights

Gale Meadows Pond is the dominant feature on the parcel. Its relatively undeveloped shoreline and scenic views provide a remote experience. The pond provides habitat for a warm water fishery. Several important natural community types exist at Gale Meadows WMA. Of these, dwarf shrub bogs and spruce-fir-tamarack swamps are the most ecologically significant of the 15 natural community types identified on the property.

Wildlife considered common on the property are those whose primary habitat requirements consist of the following: upland northern hardwood such as deer and turkey; lowland spruce/fir, such as snowshoe hare and fisher; and aquatic habitats, like beaver and muskrat, amphibians, waterfowl, mink, and otter. A deer wintering area exists on 110 acres on the southern portion of the WMA. Black bear use the property as a seasonal feeding area. Of 13 species of reptiles and amphibians found on the WMA, none are considered rare or threatened (Appendix C).

Bird species found on the WMA are typical of Vermont habitats. Bird surveys have documented 51 different species occurring on the property. Different species of ducks and geese frequent the property, and there has been healthy reproduction of Canada geese on the pond in past years. An occasional bald eagle or common loon is sometimes reported, although nesting has not been documented. Historically both great blue herons and northern goshawks have been reported nesting, although no recent activity has been documented.

The pond's fishery consists primarily of largemouth bass, chain pickerel, and yellow perch due to the shallow depth of the pond. The pond has a maximum depth of about 20 feet and an average depth of approximately eight feet. A natural, self-sustaining population of brook trout exists within Mill Brook.

[Figure 1. Base Map.]

[Figure 2. Biophysical Regions Map.]

The following rare plants and animals have been found on the property: a rare aquatic plant species, low water-milfoil; one uncommon aquatic plant, whorled bladderwort; one rare invertebrate downstream of the pond, eastern pearlshell mussel; and a rare bird, the black-backed woodpecker.

C. **Land Use History/Historic Resources Highlights**

As with most 19th century agricultural lands in the higher elevations of Vermont, Gale Meadows WMA has a historical record that parallels human uses through the past 200 years. These range from clearing cropland and pasture in the early 1800s, to farm abandonment in the late 19th/early 20th centuries, to the diverse forms of land uses practiced today. Much of the Gale Meadows WMA was used for agriculture during this same time period. As a result, most of the property was once cleared of trees. Picture archives of the 1940s depict young forests returning to areas previously pastured or tilled.

During the historic resources inventory process, three cultural/historic districts (40 acres) were identified along with several miles of stonewalls and an assortment of other miscellaneous historic features. One of these districts includes a house and barn which are still intact and in fairly good condition considering the almost 200 years they have stood.

D. **Recreation Resources Highlights**

The state acquisition of the six acres of this property located in Londonderry includes both the dam site and the public access area for public hunting and fishing. Currently there is a ¾-mile hiking trail to the north of the access area that follows the pond perimeter and ends on a peninsula on the other side of the pond.

People use the forested portions of the WMA primarily to hunt, trap, view wildlife, hike, and ski.

Fishing and boating are popular water-based activities on the 195-acre pond.

E. **Timber Resources Highlights**

Forest composition includes white pine, northern hardwood species, hemlock, red spruce, and balsam fir. The majority of the forest stands are ‘mature’ in age. White pine that is currently growing on this property was established when the agricultural fields were abandoned in the early to mid 20th century. There has not been any recent logging on the property, but there is evidence of historic timber harvesting in some areas. There are two remaining old sugarbush areas, totaling roughly 30 acres, adjacent to stone foundations.

F. **Purpose for Ownership**

The primary purposes of ownership of this parcel by the Vermont Fish & Wildlife Department are summarized through the following goals:

- Protect and enhance wildlife habitat through the development of early successional habitat, improvement of deer wintering areas, and protection of unique habitats.

- Provide high quality wildlife-based recreational opportunities (hunting, fishing, trapping, and wildlife viewing).
- Provide sustainable, periodic timber harvesting in appropriate areas to promote wildlife habitat and forest productivity.
- Protect and improve public access and appropriate management and disposition of facilities.

G. Relationship to the Region

The long-range management plan for the Gale Meadows WMA is consistent with the rural lands, natural resources, and community resources policies within the existing Regional Plan developed by the Windham Regional Commission.

The WMA is located within an agricultural/rural residential land use area that has been classified and identified in the Winhall town plan. Appropriate uses include “all types of agriculture, forestry, and other related uses...” The portion of the WMA in Londonderry is located in the low density developed district. Management complies with the goals outlined in the Natural Resource section of the current town plan. The WMA also provides recreational opportunities for Winhall and Londonderry residents and visitors.

Gale Meadows WMA sits to the east of lands owned by the Green Mountain National Forest. A forested wildlife corridor along Mill Brook provides connectivity between the two ownerships. Three conserved properties are adjacent to Gale Meadows: the Castle Property, Woodbridge Farm, and Haven Hill Farm (Figure 3).

Gale Meadows WMA is one of three parcels comprising the Gale Meadows Conservation Project. As a result, 900± contiguous acres in the town of Winhall have been protected from development. The goals of the project encourage good land stewardship and the protection and conservation of wildlife habitats, water quality, cultural/historic sites, and open space.

H. Legal Constraints

Gale Meadows WMA is subject to a variety of legal restrictions that the State acquired when purchasing the land. The Vermont Land Trust holds easements on approximately 60% of the property. These easements and deed restrictions outline many activities and appropriate uses for certain sections of the property. This plan documents all legal constraints and identifies their locations in the legal constraints assessment located in the resource analyses section.

[Figure 3. Conserved Lands Map.]

III. Public Input

The public involvement process for Gale Meadows WMA began in 2004 when the Springfield District Stewardship Team consulted the Winhall and Londonderry town selectboards and the regional planning commission, informing them that the planning process was underway. A special website, with information about the parcel, was also established in this effort.

On June 29, 2004 an advertised public input meeting was held to discuss all aspects of management for Gale Meadows WMA at the Winhall Mountain School in Winhall, Vermont. Using an open house format, the district staff displayed the draft plan with a series of panels. The public was able to discuss parcel resources and management with staff at each panel. A 60-day public comment period followed the public meeting.

The Gale Meadows draft plan was available for public review at the Winhall and Londonderry town clerk's office and library and at the Springfield District Office prior to the public meeting and during the 60-day comment period. People were encouraged to respond by letter, e-mail, or directly to one of the team members responsible for developing the long range management plan (LRMP).

After the 60-day public comment period, the District Stewardship Team compiled the comments and made additions to the LRMP to reflect the comments received. Public comments and stewardship team responses are located in Appendix D.

IV. Resource Analyses

The resource assessments described in this section of the plan make up the information sources that were considered for management decisions for this parcel.

A. Ecological Assessment

The Agency of Natural Resources (ANR) uses the “coarse filter/fine filter” approach to the ecological inventory and assessment of state lands. Recognized as an effective tool for inventorying and managing biological resources, it is an aid to land managers who seek to protect most or all of the species that naturally occur on their lands, but who lack the resources to make exhaustive inventories of all taxonomic groups (for example, fungi and soil invertebrates). Instead, natural communities are treated as a proxy for the biological organisms of which they are composed. It is thought that if examples of all natural communities are conserved at the scale at which they naturally occur, most of the species they include, from the largest trees and mammals to the smallest insects, will also be conserved. Natural communities are thus a coarse filter for “catching” the majority of an area’s native organisms. Because conservation (natural communities) will not protect all species, the ANR also employs a “fine filter” to catch the remaining species that are known to require very specific conditions for their growth, reproduction, wintering, etc. Examples of organisms benefiting from the fine filter inventories described below include breeding birds, deer (wintering areas), and rare plants.

The coarse filter assessment begins by describing landscape and climatic factors that characterize Gale Meadows Wildlife Management Area, such as bedrock geology and water resources. It then details the 15 distinct natural community types and 2 aquatic community types, which were documented and mapped during inventories of the wildlife management area. This is followed by a fine filter assessment describing rare species and specialized habitat types found here.

1) **Coarse Filter Assessment**

Biophysical Region and Climate – Vermont has been divided into eight regions, each of which share features of climate, topography, geology, human history, and natural communities. Gale Meadows WMA is located in the Southern Green Mountains biophysical region, which includes the mountainous central part of the state from the border with Massachusetts north to the towns of Chittenden, Stockbridge, and Bethel (Figure 2). Like the Northern Green Mountains biophysical region, this region is part of the Appalachian Mountain system that stretches across much of the eastern side of North America. This area is characterized by relatively low temperatures, high levels of precipitation, and a short growing season. The land is generally high and frequently steep, though there are some large high-elevation plateaus. Bedrock is acidic and glacial till abundant. Gale Meadows has some of the characteristics of the warmer adjacent Southern Piedmont biophysical region due to relatively low elevation compared with other areas within the Southern Green Mountain biophysical region.

Bedrock and Surficial Geology and Soils – Bedrock at Gale Meadows is of the Mount Holly complex containing some of the oldest rocks in the state. Originally deposited during the Precambrian era, these rocks were later metamorphosed by intense heat and pressure. Mount Holly bedrock is usually biotitic gneiss. It may also contain mica schist, quartzite, and calc-silicate granulite. These are relatively hard, slow-weathering rocks that contribute minerals to soils and ecological communities very slowly.

As the last glaciers receded some 12,000 years ago, they left behind a blanket of unsorted silt, sand, and rock fragments known as glacial till. More recently, organic and alluvial soils have formed on small floodplains and in swamps. Almost 90% of the soils mapped here are derived from glacial tills (see Figure 11). About half of these are rocky to very rocky glacial tills of the Berkshire, Tunbridge, and Lyman series. Most are 10-60” deep, but a few are less than 40” in depth. The other half is deeper, very stony dense tills, including Peru fine sandy loam and Cabot silt loam. About 30 acres of the parcel are mapped as organic and alluvial soils, including Adrian and Saco soils and Carlisle mucky peat. About 15 acres of loamy-skeletal udifluvents are mapped along Mill Brook where it enters the parcel. It is not known what soil types and natural communities occurred here before the creation of the man-made Gale Meadows Pond, but it seems likely that wetlands and organic soils were present. Early European settlers often used the word “meadow” to describe naturally occurring grassy wetlands such as fens, and wetlands of this sort may have once occurred in the basin that is now a pond.

Hydrology/Streams/Rivers/Ponds – Gale Meadows Pond is the dominant feature of the property. This 195-acre artificial impoundment was created in 1965 by the Vermont Fish and Wildlife Department by damming Mill Brook. It was constructed for habitat improvement for game and non-game species and is the third largest water body in southern Vermont. Gale Meadows Pond is located within the West River watershed. The pond has an estimated drainage area of 6,573 acres, a maximum water depth of about 20 feet, and an average water depth of about 8 feet. Mill Brook is the principal stream flowing into the pond. It originates on lands within the Green Mountain National Forest, and flows from the west through French Hollow before discharging into the south arm of the pond. Mill Brook exits the impoundment at the dam located adjacent to the public access and boat launching area at the end of the eastern arm. From there the stream flows another 1.9 miles before merging with the Winhall River, a tributary of the West River. Other streams flowing into Gale Meadows Pond are intermittent. Two of these enter the pond’s north arm. Several seeps and vernal pools, formed in soil and bedrock depressions, are located on the property. In addition, there are two man-made springs on the WMA. All are dependent on seasonal runoff from snow melt and rains. In wet years they may retain water throughout the year.

Natural Community Types – A natural community is an assemblage of biological organisms, their physical environment (e.g., geology, hydrology, climate, natural disturbance regime, etc.), and the interactions between them. More than a simple collection of species, a natural community is characterized by complex webs of mutualism, competition, predation, and other forms of interaction. The 80 natural community types described in Vermont repeat across the landscape in patches of various sizes. These patches (or groups of patches in close proximity to each other) are referred to as natural community *occurrences*, and are to be distinguished from broad descriptions of community types.

Thompson and Sorenson (2000) described three general size categories for natural communities. Matrix communities occur in broad expanses across the landscape and form the context in which other, smaller communities are found. They are shaped by landscape-level disturbance processes, such as periodic weather events and insect outbreaks. Northern Hardwood Forest and Lowland Spruce-Fir Forest are two examples of matrix communities found at Gale Meadows. Large patch communities typically occur at scales of 10-100 acres, and are structured by local bedrock, geological, and topographic factors. Spruce-Fir-Tamarack Swamps are a characteristic large-patch natural community of the WMA. Small patch communities are usually less than 10 acres in size, and owe their existence to highly localized site and disturbance characteristics. Local

hydrology and microclimate combine to produce Dwarf Shrub Bogs, a small patch community found here.

Methodology – Natural communities were identified through aerial photograph interpretation, systematic FOREX inventory (see timber assessment section), and field surveys. Many plant specimens were collected for identification in the lab. A Geographic Information System (G.I.S.) map of natural communities was produced using Arcview software. Because some natural communities occur at very small scales (e.g., less than 1/2 acre), this mapping effort is probably incomplete. Natural community mapping is an iterative process, and our knowledge improves with each mapping effort. Thus, the map presented here should not be viewed as a final statement on community distribution at Gale Meadows WMA; instead, it should be treated as a first attempt at describing natural communities in this area. Additional examples of small natural communities (e.g., vernal pools and seeps) probably occur at Gale Meadows WMA. As subsequent inventories and site visits are conducted, this map will be improved. Detailed descriptions of Vermont's natural community types are found in the 2000 *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* by Thompson and Sorenson. Identified aquatic communities are described in *A Classification of Aquatic Communities of Vermont* prepared in 1998 by the Aquatic Classification Workgroup for the Vermont Biodiversity Project.

Natural Community Types on the WMA – There are 32 occurrences of 15 natural community types which have been identified and mapped on the 512 acres of wetlands and uplands surrounding the pond (Figure 4). The water resources are represented by two aquatic community types. Sixty-five natural community polygons, one parking area/lawn polygon, three open field polygons, and two open water polygons were mapped.

What follows is a description of all natural community types identified at Gale Meadows WMA. For each community type, the unique identifying numbers of all polygons on the map are given. If more than one polygon constitutes a natural community occurrence, this information is given. A quality rank (A through D) for each natural community occurrence was determined. Quality ranks are objectively assigned on the basis of occurrence size, current condition, and landscape context. An A-ranked occurrence is of high quality in comparison with other occurrences of its natural community in the state, while a D-ranked example is of comparatively low quality. Natural communities differ in the degree to which the three ranking characteristics affect their ecological quality. For example, for Northern Hardwood Forests, size is the most important characteristic. For small isolated wetland communities, landscape context may be the most important. It is important to recognize that assignment of low quality ranks may be due to small size rather than poor condition.

[Figure 4. Natural Communities Map.]

a) Red Spruce-Northern Hardwood Forest

This natural community occurs in nine separate locations on the WMA and totals 184 acres. These locations have moderately well drained, very rocky glacial till soils of the Tunbridge-Berkshire complex and Peru fine sandy loam soils. The majority of this occurrence (82%) is dominated by 100-120' tall white pine (*Pinus strobus*), established when agricultural fields were abandoned. As this forest ages, white pine will decline and become a much less important part of the tree canopy. Other canopy trees present are red spruce (*Picea rubens*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and balsam fir (*Abies balsamea*). Eastern hemlock (*Tsuga canadensis*) may be present in low abundance. Striped maple (*Acer pensylvanicum*) is a common understory shrub, as are regenerating canopy tree species. A low shrub layer comprised of lowbush blueberry (*Vaccinium* sp.) is sometimes present. Many species of understory herbs may be found here; some of the more common include drooping woodreed (*Cinna latifolia*), starflower (*Trientalis borealis*), wild sarsaparilla (*Aralia nudicaulis*), Christmas fern (*Polystichum acrostichoides*), New York fern (*Thelypteris noveboracensis*), Canada mayflower (*Maianthemum canadense*), bunchberry (*Cornus canadensis*), goldthread (*Coptis groenlandica*), Indian pipe (*Monotropa uniflora*), and ground cedar (*Lycopodium* species). This is a C-ranked occurrence of Red Spruce-Northern Hardwood Forest. Refer to Appendix C, Point 3 for bird species found in this community.

b) Northern Hardwood Forest

Two occurrences of Northern Hardwood Forest, composed of four separate areas, cover 55 acres of the WMA. This regionally common forest type occurs on a variety of soils here, including rocky glacial tills and fine sandy loams. The forest canopy is dominated by American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*). Other trees occasionally seen in the canopy include paper birch (*Betula papyrifera*), eastern hemlock (*Tsuga canadensis*), black cherry (*Prunus serotina*), and white ash (*Fraxinus americana*). The tall shrub layer is composed of regenerating trees of these species, plus striped maple (*Acer pensylvanicum*). Ground plants present include Christmas fern (*Polystichum acrostichoides*), hay-scented fern (*Dennstaedtia punctilobula*), shining clubmoss (*Lycopodium lucidulum*), wild sarsaparilla (*Aralia nudicaulis*), blue-stemmed goldenrod (*Solidago caesia*), and sweet cicely (*Osmorhiza claytonii*). Most Northern Hardwood Forest stands on the parcel are in a late-successional stage, and show little sign of harvest in the last century. Consequently, in some places there are higher numbers of large dead snag trees and more large diameter coarse woody debris on the forest floor than one would see in a younger Northern Hardwood Forest. The two areas mapped as this community occurrence are believed to be old sugar bushes and are dominated by sugar maples (*Acer saccharum*) of very large diameter. These trees are in various stages of decay and as a result are dropping out of the stand. Regeneration in these expansive canopy openings consists of typical Northern Hardwood species. Despite the advanced age and good ecological condition of these northern hardwood stands, both occurrences have a low (D) quality rank. This is due to their small size relative to other examples in the state. Refer to Appendix C, Point 6 for bird species found in this community.

c) Hemlock Forest

There is one small three-acre area of Hemlock Forest within the WMA. Soils are moderately well-drained, very stony fine sandy loam. Eastern hemlock (*Tsuga*

canadensis) makes up most of the canopy. Red spruce (*Picea rubens*) and red maple (*Acer rubrum*) are occasionally encountered also. Regenerating trees are infrequent and other shrubs are sparse or absent. A very sparse herb layer includes partridgeberry (*Mitchella repens*), Christmas fern (*Polystichum acrostichoides*), Goldthread (*Coptis trifolia*), and Ground cedar (*Lycopodium digitatum*). This Hemlock Forest is of low quality (D-ranked) due to its small size. Hemlock-Red Spruce Forest, a variant of this natural community, also occurs at the WMA (see section 5 below).

d) Hemlock-Northern Hardwood Forest

This common forest community type covers 80 acres of the WMA. Four separate areas were mapped to the south and west of the pond. Most soils are well drained, rocky sandy loams, like those found in Hemlock-Red Spruce Forests, but this community also occurs on some of the shallower (bedrock present at less than 40 inches) glacial tills. Hemlock (*Tsuga canadensis*) is the most common tree in the canopy. Hardwoods are also prominent, including paper birch (*Betula papyrifera*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), and American beech (*Fagus grandifolia*). A relatively sparse shrub layer includes striped maple (*Acer pensylvanicum*), witch hazel (*Hamamelis virginiana*), maple-leaved viburnum (*Viburnum acerifolium*), American fly honeysuckle (*Lonicera canadensis*), and lowbush blueberry (*Vaccinium* species). The sparse herb layer consists of plants characteristic of wet to dry northern places, including Canada mayflower (*Maianthemum canadense*), intermediate woodfern (*Dryopteris intermedia*), wild oats (*Uvularia sessilifolia*), bluebead lily (*Clintonia borealis*), bunchberry (*Cornus canadensis*), partridgeberry (*Mitchella repens*), pink ladyslipper (*Cypripedium acaule*), poverty grass (*Danthonia spicata*), bracken fern (*Pteridium aquilinum*), and silverrod (*Solidago bicolor*). Due to its relatively small size, this community occurrence is of moderately low quality (C-ranked).

e) Hemlock-Red Spruce Forest

Hemlock-Red Spruce Forest is a variant type of Hemlock Forest (see section 3 above). These forests are common throughout the state, and represent a sort of ecological intersection between several forested natural community types dominated by red spruce and eastern hemlock. A 13-acre occurrence of this community is found on the southern portion of the WMA. Soils are classified as dense glacial tills; these are deep (greater than 60”), very stony, somewhat well-drained fine sandy loams. Hemlock accounts for more than 50% of the shady canopy of this forest, with red spruce (*Picea rubens*) making up at least 30%. Red maple (*Acer rubrum*) and balsam fir (*Abies balsamea*) are often common; American beech (*Fagus grandifolia*), yellow birch (*Betula allegheniensis*), and white pine (*Pinus strobus*) may be present in lower abundance. Widely separated striped maple (*Acer pensylvanicum*) and lowbush blueberry (*Vaccinium* species) make up the sparse shrub layer. The herb layer is also sparse, and includes bracken fern (*Pteridium aquilinum*), wood sorrel (*Oxalis acetosella*), interrupted fern (*Osmunda claytoniana*), Indian cucumber (*Medeola virginiana*), ground cedar (*Lycopodium* species), starflower (*Trientalis borealis*), drooping woodreed (*Cinna latifolia*), and hairy woods grass (*Brachyeletrum erectum*). It is unclear why red spruce is so abundant here, as the site seems well-suited to establishment of Hemlock Forest. It is possible that land use history played a role in the current canopy composition and, that, over time, red spruce will become less abundant here. On the other hand, the two conifers may continue to share dominance of the canopy for a long period of time. This is a D-ranked occurrence of Hemlock-Red Spruce Forest due to its small size. Refer to Appendix C, Point 4 for bird species found in this community.

f) Hemlock Swamp

Two occurrences of this rare natural community type are found on the WMA. Together they account for less than five acres of the land here but are important from a regional perspective, since most known examples of Hemlock Swamp are found in the warmer Connecticut River and Champlain Valleys. Soils are saturated, acidic (pH=5.2-5.4 in one sample) peat ranging from two to four feet in depth. The floor of the swamp is hummocky and features abundant coarse woody debris. Hemlock (*Tsuga canadensis*) is the most common tree in the canopy; in places red spruce (*Picea rubens*) is also quite common. Other tree species present include red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), balsam fir (*Abies balsamea*), and black ash (*Fraxinus nigra*). A moderately well developed shrub layer includes highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), witch hazel (*Hamamelis virginiana*), and serviceberry (*Amelanchier* species). The herb layer is dense and diverse; species present include cinnamon fern (*Osmunda cinnamomea*), lady fern (*Dryopteris filix-femina*), sensitive fern (*Onoclea sensibilis*), crested wood fern (*Dryopteris cristata*), sweet-scented bedstraw (*Galium triflorum*), halberd-leaved tearthumb (*Polygonum arifolium*), swamp saxifrage (*Saxifraga pensylvanica*), golden saxifrage (*Chrysosplenium americanum*), Goldthread (*Coptis trifolia*), water horehound (*Lycopus americanus*), drooping woodreed (*Cinna latifolia*), gynandrous sedge (*Carex gynandra*), lima bean sedge (*Carex leptalea*), spotted touch-me-not (*Impatiens capensis*), asters (*Aster species*), and violets (*Viola species*). Mosses, particularly peat mosses (*Sphagnum* species), form a nearly continuous blanket over the moist hummocks and hollows of the swamp floor. Many species are present; those noted include *Sphagnum squarrosum*, *S. russowii*, *S. magellanicum*, and *Mnium* species. These Hemlock Swamps have well-developed canopies, good diversity, and spatially diverse (i.e., hummocky, debris-strewn) substrates, but their small size warrants only C and C/D quality ranks.

g) Lowland Spruce-Fir Forest

Lowland Spruce-Fir Forest is one of the widely occurring “matrix” communities within which others are found on the WMA. A single 97-acre occurrence consists of nine separate areas scattered across the property. Soils are moderately well-drained to excessively drained and consist of sands and gravels. Most of this area is dominated by a tall canopy of white pine (*Pinus strobus*) that is slowly being replaced by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*). Shrubs species include striped maple (*Acer pensylvanicum*), hobblebush (*Viburnum alnifolium*), and Canada honeysuckle (*Lonicera canadensis*). The moderately dense herb layer includes common wood sorrel (*Oxalis acetosella*), bunchberry (*Cornus canadensis*), Canada mayflower (*Maianthemum canadense*), goldthread (*Coptis trifolia*), starflower (*Trientalis borealis*), pinesap (*Monotropa hypopithys*), swollen sedge (*Carex intumescens*), poverty grass (*Danthonia spicata*), intermediate woodfern (*Dryopteris intermedia*), and bracken fern (*Pteridium aquilinum*). Helleborine (*Epipactis helleborine*), a non-native plant, is common in this community. Mosses were abundant in places. The Lowland Spruce-Fir Forest occurrence on the WMA has a moderate (C) quality rank. Refer to Appendix C, Point 2 for bird species found in this community.

h) Seep

Three seeps covering about two acres were mapped on the property; two of these are very close together and are treated as a single community occurrence. They are found on moderately steep (5%-10%) slopes. They have a largely closed canopy of trees typical of

the Northern Hardwood Forest in which they are most often found. Soils are about 20" of peaty muck on top of stony mineral soils. Plants typical of wetlands and seepage areas are common here. Where a shrub understory exists, speckled alder (*Alnus incana*) is usually the dominant species. Herbs are dense and relatively diverse; examples include three-seeded sedge (*Carex trisperma*), slender mannagrass (*Glyceria melicaria*), Canada mannagrass (*Glyceria canadensis*), jewelweed (*Impatiens* species), joe-pye weed (*Eupatorium maculatum*), sensitive fern (*Onoclea sensibilis*), pennywort (*Hydrocotyle americana*), golden saxifrage (*Chrysosplenium americanum*), water horehound (*Lycopus americana*) and marsh bedstraw (*Galium palustre*). Seeps are among the first areas of a forest to green up in spring and, as such, may be important feeding sites for wildlife. They are also important habitats for a diverse array of amphibians and invertebrates who pass part or all of their life cycles in the seep's saturated soils. The three Seep occurrences at Gale Meadows have C and D quality ranks. Other seeps may exist here, and should be noted if they are found. See Appendix C for amphibian species found.

i) Vernal Pool

Eight Vernal Pools were found on the property. Vernal Pools are seasonally-flooded depressions in the forest floor. During spring (and sometimes fall) inundations, pools are critical habitat for a variety of amphibians, insects, clams, and other invertebrates. The eight documented pools at Gale Meadows comprise five ecological occurrences. Two of these were created for agricultural purposes. Non-natural pools tend to be deeper and hold water longer than the naturally occurring pools. The largest natural pool is about a half acre in size and is determined to be the most significant (C quality rank; all others are D ranked due to small size and evidence of disturbance) of the vernal pools on the property. It features a 75-85% canopy cover of trees native to the surrounding Red Spruce-Northern Hardwood Forest (see above). The upper soil layer (4" deep) is composed of organic material, under which is more than 12" of extremely compact gray, silty clay. There is much woody debris, but only moderate amounts of large diameter ("coarse") woody material. Wetland vegetation surrounds the pool, but many areas of unvegetated muck are present in the middle. Shrubs present are winterberry (*Ilex verticillata*) and meadowsweet (*Spiraea latifolia*). Herbs include marsh fern (*Thelypteris palustris*), cinnamon fern (*Osmunda cinnamomea*), mild waterpepper (*Polygonum hydropiper*), inflated sedge (*Carex intumescens*), three-seeded sedge (*Carex trisperma*), two seeded sedge (*Carex disperma*), bulrush (*Scirpus* species), colt's foot (*Tussilago farfara*), and dwarf raspberry (*Rubus pubescens*). Mosses, including peat moss (*Sphagnum* species), were noted. These pools host a variety of amphibians during their breeding seasons (See Appendix C for amphibian species found). Other Vernal Pools may occur at Gale Meadows WMA and will be documented as they are found.

j) Dwarf Shrub Bog

Dwarf Shrub Bogs are rare in Vermont, and a good (B-ranked) example occurs on islands at the north end of Gale Meadows pond. The five separate islands are composed of peat and decomposing plant matter. These islands collectively are approximately three acres in size. They appear to be at least partly anchored to the pond bottom. However, much of each island consists of a floating mat of vegetation, and it is possible they may move over time. The ground in this community is hummocky and saturated with water at or near the surface at all times. Stunted trees in the bog range from 12-20' in height and provide only about 10% cover. Black spruce (*Picea mariana*) and tamarack (*Larix laricina*) were the only species noted. Shrubs are densely aggregated and include leatherleaf (*Chamaedaphne calyculata*), sheep laurel (*Kalmia angustifolia*), black huckleberry

(*Gaylussacia baccata*), bog rosemary (*Andromeda glaucophylla*), speckled alder (*Alnus incana*), and meadowsweet (*Spiraea latifolia*). Herbs are also abundant, and include cranberry (*Vaccinium oxycoccus*), marsh skullcap (*Scutellaria galericulata*), pitcher plant (*Sarracenia purpurea*), round-leaved sundew (*Drosera rotundifolia*), marsh marigold (*Caltha palustris*), blue flag iris (*Iris versicolor*), swamp candles (*Lysimachia terrestris*), three-way sedge (*Dulichium arundinaceum*), three-seeded sedge (*Carex trisperma*), garish sedge (*Carex lurida*), rush (*Juncus* species), and cattail (*Typha latifolia*). Bryophytes form a near-complete cover over the ground, and include at least three species of peat moss (*Sphagnum*). (See Appendix C for amphibian species found)

k) Spruce-Fir-Tamarack Swamp

Five occurrences of this forested wetland community cover 26 acres of the WMA. The ground in these swamps is moss covered and moderately hummocky. Soils have been mapped as Adrian and Saco, a type associated with various wetland natural communities. Field study showed them to be deep (greater than 3.5') peat, with abundant woody debris throughout, and water present at 6-8" depth. The 35-40' tree canopy has greater than 90% crown closure and is dominated by black spruce (*Picea mariana*), tamarack (*Larix laricina*), and red spruce (*Picea rubens*). Red maple (*Acer rubrum*), white pine (*Pinus strobus*), and yellow birch (*Betula allegheniensis*) were sometimes present in lower abundance. A moderately sparse tall shrub layer features winterberry (*Ilex verticillata*), mountain holly (*Nemopanthus mucronata*), and American mountain ash (*Sorbus americana*). Short shrubs such as lowbush blueberry (*Vaccinium* species) and common pinkster flower (*Rhododendron prionophyllum*) are sparsely distributed in the understory. Herb density varies with gaps in the canopy. Species of herbs include cinnamon fern (*Osmunda cinnamomea*), starflower (*Trientalis borealis*), bunchberry (*Cornus canadensis*), wood sorrel (*Oxalis acetosella*), whorled aster (*Aster acuminatus*), goldthread (*Coptis groenlandica*), dewdrop (*Dalibarda repens*), and three-seeded sedge (*Carex trisperma*). Mosses cover nearly 100% of the substrate. Species of moss noted include stairstep moss (*Hylocomnium splendens*), bazzania (*Bazzania trilobata*), and knight's plume (*Ptilium crista-castrensis*). The large swamp in the southeast corner of the parcel is of good (B-ranked) quality; others are all of low (D) overall quality due to small size. (See Appendix C for amphibian species found).

l) Beaver Wetlands

There are three beaver-maintained wetlands on the parcel covering approximately 13 acres. Beaver wetlands are variable natural communities, and there is no one community type that can accurately describe all of them. Perhaps the most appropriate term would be a beaver "wetland complex" because there can be many different types of habitats within one area. Some beaver complexes resemble an Alder swamp, some a Cattail Marsh, and some a Shallow Emergent Marsh. Commonly encountered plants include ostrich fern (*Matteuccia struthiopteris*), speckled alder (*Alnus incana*), joe-pye weed (*Eupatorium maculatum*), rush (*Juncus* species), bulrush (*Scirpus* species), and cattail (*Typha latifolia*). Some of the beaver wetlands at Gale Meadows feature ponds studded with dead conifers, a sign that, before being flooded, the sites supported communities such as Lowland Spruce-Fir Forest or Spruce-Fir-Tamarack Swamp. Beaver complexes have significant effects on species diversity and landscape ecology. They increase overall biological diversity and provide habitats for a variety of birds, mammals, amphibians, fish, invertebrates, and other animals. (See Appendix C for amphibian species found).

m) Cattail Marsh

A single two-acre cattail marsh is found at the southern end of the pond. It is a small example relative to others in the state and therefore is rated as low (D) quality. The most common herb species is of course the cattail (*Typha latifolia*). Other plant species present here were not recorded, but Cattail Marshes may be expected to harbor shrubs such as speckled alder (*Alnus incana*) and a variety of wetland herbs including marsh fern (*Thelypteris palustris*), sensitive fern (*Onoclea sensibilis*), blue flag iris (*Iris versicolor*), rushes (*Juncus* species), and sedges (*Carex* species). Cattail Marshes serve multiple functions in wet areas, from water quality maintenance to critical wildlife habitat for a variety of species. (See Appendix C for amphibian species found and for bird species found.)

n) Red Maple – Black Ash Swamp

Red Maple-Black Ash swamps are common throughout Vermont, although typically not found with high frequency within the Southern Green Mountain biophysical region. They are replaced by conifer-dominated swamps in this biophysical region. Gale Meadows WMA has some characteristics tending toward the warmer Southern Vermont Piedmont region due to relatively low elevation compared with other areas within its own biophysical region. The one occurrence of less than one acre is on a hill just south of the pond in a surface depression. It is fed by a pool a little higher up slope and therefore receives water beyond spring run off. The soils are saturated through much of the year, mucky, and typically deep. The ground does not have pronounced hummocks, as is typical for well-developed examples of this community. Shallow rooted trees such as red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), and black ash (*Fraxinus nigra*) comprise the majority of the 65% closed, 45' tall canopy; red spruce (*Picea rubens*) and eastern hemlock (*Tsuga canadensis*) are also present. The tall shrub layer is quite dense, and includes arrowwood (*Viburnum dentatum*), winterberry (*Ilex verticillata*), and speckled alder (*Alnus incana*). Herbs are dense and diverse. Common species include cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), crested wood fern (*Dryopteris cristata*), marsh fern (*Thelypteris palustris*), Canada mayflower (*Maianthemum canadense*), wild sarsaparilla (*Aralia nudicaulis*), marsh bedstraw (*Galium palustris*), and narrow-leaved gentian (*Gentiana linearis*). Mosses are common on the ground but do not have the complete coverage sometimes seen in swamps of this type. It is D-ranked.

o) Shallow Emergent Marsh

This is a common community throughout Vermont, and being a broad classification for partially submerged aquatic plant communities, it could be broken into many more community types. Shallow Emergent Marshes are characterized by flooded or saturated soils usually with water above ground level for most of the year. The best ranked (C) example at Gale Meadows extends around the perimeter of the pond. This area encompasses all of the alcoves and wetlands associated with and adjacent to the pond itself and is slightly over 40 acres total. There are two other occurrences of this community type on the property. One is located on the easterly edge of the property adjacent to the access area. This was probably created when the parking lot was built but also is influenced by a beaver colony. The other example is on the westerly side of the pond in a small drainage.

Shallow Emergent Marshes on the parcel usually have a low percent cover of shrubs such as speckled alder (*Alnus incana*), meadowsweet (*Spiraea latifolia*), and wild raisin (*Viburnum cassinoides*). Herbs are diverse and become very abundant by midsummer. Common species are sensitive fern (*Onoclea sensibilis*), marsh marigold (*Caltha palustris*), dwarf raspberry (*Rubus pubescens*), spotted touch-me-not (*Impatiens capensis*), bugleweed (*Lycopus uniflora*), St. John's wort (*Hypericum* species), Canada mannagrass (*Glyceria canadensis*), bluejoint grass (*Calamagrostis canadensis*), three-way sedge (*Dulichium arundinaceum*), bulrushes (*Scirpus* species), cattail (*Typha latifolia*), asters (*Aster* species), goldenrods (*Solidago* species), and bur-reed (*Sparganium* species). A variety of mosses can be found in this community. The occurrence that extends around the ponds perimeter has many seepy interfaces with adjacent uplands. Plants common to seeps and swampy wetlands prevail along the shoreline. These include bunchberry (*Cornus canadensis*), wood sorrel (*Oxalis acetosella*), golden saxifrage (*Chrysosplenium americanum*), water purslane (*Ludwigia palustris*), and peat mosses (*Sphagnum russowii* and others). Deep emergent species anchor at the watery margin of this community, including yellow water lily (*Nuphar variegata*), white water lily (*Nymphaea odorata*), water shield (*Brasenia schreberi*), and whorled bladderwort (*Utricularia purpurea*), an uncommon (S3) species in the state. A number of non-native weeds and invasive species were seen in this community at the mouth of Mill Brook: purple loosestrife (*Lythrum salicaria*), common nightshade (*Solanum dulcamara*), burdock (*Xanthium strumarium*), ox-eye daisy (*Chrysanthemum leucanthemum*), purple vetch (*Vicia sativa*), black mustard (*Brassica* cf. *Nigra*), and thistles (two *Cirsium* species).

Water Resources

Pond

Gale Meadows Pond is an artificial impoundment of 195 acres. It may not conform to the definition of an aquatic community in a strictly academic sense. It nonetheless functions as a natural system with an identifiable assemblage of species and physio-chemical features that are characteristic of the mesotrophic-eutrophic lake community type. That being said, the pond at 195 acres represents the single largest community type on the WMA. The water is soft on minerals (low hardness) and slightly acidic. Temperature and dissolved oxygen profiles, based on Summer 1969 measurements, demonstrate that the pond stratifies. Unacceptable dissolved oxygen levels occur at depths greater than eight feet by early August. This condition makes the pond marginal habitat for the long-term survival of cold water fishes, such as trout, and better suited for the warm water fish community that is now present.

Streams

The few intermittent streams, which flow into Gale Meadows Pond probably have limited, if any, direct value as fish habitat but serve as important amphibian habitat. Mill Brook along its entire length represents at least three aquatic community types or pre-established fish assemblage categories based on such variables as elevation, channel size and substrate composition, water temperature and chemistry. Beginning at its headwaters and progressing downstream the following fish communities (stream types) are identified: (1) brook trout-slimy sculpin assemblage (small, high elevation, cold headwater stream), (2) brook trout-blacknose dace assemblage (moderate size, high elevation, cold water stream), and (3) blacknose dace-common shiner assemblage (moderate size, mid-elevation, mixed cold-warm water stream). The latter assemblage is also characteristic of the stream below Gale Meadows Pond dam. Of the approximate 1,500 feet of Mill Brook located on the WMA upstream of the pond, the fish

community is also characteristic of the blacknose dace-common shiner assemblage but with transitional influences of the cold water stream type and the lake fish community.

2) **Fine Filter Assessment**

This section identifies species whose habitat needs are not fully met at the natural community level. Such species include:

- rare, threatened, and endangered species that often have very specific habitat needs;
- species depending on particular critical habitats for survival or reproduction (deer wintering areas, bear-scarred beech stands, early successional habitats, etc.);
- wide-ranging species such as black bears, fisher, and bobcat;
- species sensitive to habitat fragmentation; and
- species requiring habitat conditions that are not adequately provided for by natural community-based land management.

Rare, Threatened, and Endangered Species – Gale Meadows WMA provides habitat for several rare species of animals and plants. According to one observer, two pairs of black-backed woodpecker (*Picoides arcticus*) nested on the property in the 1960s following the creation of the pond. This bird is rare in Vermont and is listed as a species of special concern. A resident of boreal conifer forests and swamps, it is more common to our north and is near the southern edge of its range in southern Vermont. A high density of flood-killed spruce trees is thought to have been the catalyst for habitat for this bird. A bird survey in 2003 failed to relocate the bird. The birds depend on standing, dead trees for foraging (their main food source is wood-boring beetles) and nesting. Although not currently thought to nest or breed on the WMA, Gale Meadows may offer suitable and adequate habitat for this species to reproduce should a large-scale tree decline occur.

Low water-milfoil was found in the pond in 1991. It is a rare plant and is ranked S2 by the Nongame and Natural Heritage Program.

Whorled bladderwort (*Utricularia purpurea*), an uncommon aquatic plant, was identified in a cove on the south side of the east arm of Gale Meadows Pond. It is ranked S3 by the Nongame and Natural Heritage Program, meaning that there are an estimated 20-100 populations statewide. The plant is probably secure here but could be adversely affected by changing water levels or a high degree of boat traffic.

A population of the eastern pearlshell (*Margaritifera margaritifera*) mussel occurs in Mill Brook below the natural falls, approximately 1.8 miles downstream of the Gale Meadows Pond dam. It is a state listed threatened species. Although the population is not located on the WMA property, habitat of this species could be affected by activities occurring on the WMA. Salmonids, such as brook and brown trout, are known host fishes for the eastern pearlshell.

[Figure 5. Wildlife Resources Map.]

Critical Wildlife Habitats – One hundred-ten acres of mapped deer wintering area exist on the property. All wetlands, including seeps, vernal pools, and Gale Meadows Pond, are considered critical wildlife habitat and comprise a total of 270 acres. A small heron rookery used to exist on the pond, but no nesting has been documented in recent years. A northern goshawk nest has historically been reported on the property, but no recent reports have been made.

Wildlife – A wide variety of wildlife habitats are found on this property and includes all species typically found in the Southern Green Mountain biophysical region. Figure 5 illustrates areas, references, and points of interest.

- a. **Bear** – In Vermont, black bear are distributed along the length of the Green Mountain spine. Although Gale Meadows WMA is periodically used by black bears, it is not considered to be production habitat for reproducing females due to the high levels of development that surround the property (Figure 6). Productive beech stands are rare, and red oak is non-existent in this WMA. Wetlands appear to be the best habitat feature on the property for bears. They provide an early spring food source for bears such as sedges. Evidence of spring feeding in wetlands by black bears has been documented on the WMA and the adjacent Castle property.

The CVPS transmission line (150 feet wide) crosses 2500 feet of Gale Meadows WMA and provides considerable edge, grasses, raspberries, etc. It generally adds diversity to the habitat.

Bears access the WMA from the west across Winhall Hollow Road via the Mill Brook drainage. Maintaining this connection is critical to bear use of the property over the long term.

- b. **Deer** – White-tailed deer are found in all Vermont towns but are most abundant in lower elevations. All of the seasonal habitat requirements for white-tailed deer are provided on the Gale Meadows WMA. The Vermont Fish & Wildlife Department has divided the state into deer management units based on elevation and biophysical regions. This parcel is located on the southern edge of Management Unit ‘L’, characterized by upper elevations of hardwood forest and lower elevations of mixed forest with few agricultural areas. One-hundred ten acres on the southern third of the property were mapped as critical deer wintering area. There is no evidence of deer over-browsing plants on the WMA.
- c. **Turkey** – Gale Meadows WMA does not provide optimum habitat for turkeys due to the high elevation and poor mast component; therefore, turkeys will not be a focus of management. However, efforts will be made to enhance the mast component for other wildlife species, which could benefit small, local populations of turkeys
- d. **Grouse (Partridge)** – There is potential to manage for grouse on portions of the WMA to improve habitat to increase grouse populations. There is a small amount of aspen on this parcel, and red maple makes up 26.4% of the main crown canopy. In addition, there are several old apple trees that still persist scattered around the property.

[Figure 6. Bear Habitat Map.]

- e. **Snowshoe Hare** – Snowshoe hare are present on Gale Meadows WMA in moderate to low numbers based on the lack of sign in winter visits to the property. This species is heavily dependent on early successional spruce/fir and mixed forests, the former being uncommon on Gale Meadows WMA. Snowshoe hare habitat could be improved on the property by encouraging patches of softwood regeneration.
- f. **Amphibians and Reptiles** – Systematic surveys of known amphibian and reptile habitats were conducted in the field season of 2001 to determine presence and absence of amphibian and reptile species. Various habitat and natural community types were surveyed with a direct physical search and audio surveys. Turtles were trapped in nine (9) locations within the pond. A list of species can be found in Appendix C of this plan, Table 1. The following is a breakdown of the results:

A total of five painted turtles (*Chrysemys picta*) and 11 snapping turtles (*Chelydra serpentina*) were captured. All were found in a variety of aquatic habitats in Gale Meadows Pond. See Figure 5 for trap locations.

Four species of salamanders were found on the study site. Eastern red-backed salamander (*Plethodon cinereus*) was the most frequently-observed species, eight individuals total, were found in all terrestrial habitats. Eastern newts (*Notophthalmus viridescens*) were the next most abundant salamander species within the parcel with six individuals found – two in the aquatic stage, the others in the Red Eft stage. Two-lined salamanders (*Eurycea bislineata*) were locally abundant around streams and areas of saturated soil (three individuals found). The most uncommon salamander species on the WMA is the northern dusky salamander (*Desmognathus fuscus*). Only one individual was found and as expected in a habitat that contained at least some water deposition.

Many frogs and toads were observed on the property. Dozens of Green frog (*Rana clamitans*) and American bullfrog (*Rana catesbeina*) were observed. They were present in all aquatic habitats, and some individuals were found in riparian terrestrial habitats. Captures of wood frog (*Rana sylvatica*) and American toad (*Bufo americanus*) were limited to approximately 12 individuals for each species. These were found not only in terrestrial habitats but also in riparian zones and sedge meadows (Figure 4 wetlands). Another common species observed was spring peeper (*Pseudacris crucifer*). One gray tree frog (*Hyla versicolor*) was found in an abandoned beaver impoundment.

Several vernal pool breeding areas were located in the Winhall Hollow road corridor. This road causes mortality when salamanders and amphibians are traveling to breeding pools.

Two common gartersnakes (*Thamnophis sirtalis*) were found within 10 meters of each other in an abandoned field with lots of surface rock present. No other snake species were observed.

Appendix C Table 1 lists the 13 species observed according to relative abundance (based on these survey results) and in relation to individual habitat types and state rank/status. Twelve of the 15 state ranked S5 species were observed in these habitat surveys. Survey results do not indicate any need to do a higher level survey for S1, S2, or S3 species.

- g. **Birds** – Surveys were conducted in the spring season of 2003 to determine presence and absence of forest interior bird species. A list of species is found in Appendix C of this plan. Point counts were conducted in six different natural community types (Figure 5). A total of 51 species were documented with the warblers being the most diverse and abundant group. Waterfowl and raptors were not surveyed. Wood duck boxes were built and hung at various locations around the pond in the mid 1980s. These are utilized annually by wood ducks. An osprey platform was erected in the pond in 2001 but thus far has not been used.
 - h. **Pond** - Fish population surveys conducted by the Vermont Fish and Wildlife Department have found the following species to in Gale Meadows Pond: golden shiner (*Notemigonus crysoleucas*), white sucker (*Catostomus commersoni*), brown bullhead (*Ameiurus nebulosus*), chain pickerel (*Esox niger*), rock bass (*Ambloplites rupestris*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), and yellow perch (*Perca flavescens*). With exception of rock bass, bluegill, and largemouth bass, all other species occurring in the pond are native to the West River watershed and upper Connecticut River basin. For a number of years (1966-1997) the pond was stocked annually with yearling brown trout (*Salmo trutta*) for recreational fishing. However, in 1970 largemouth bass, better suited to the habitat, were introduced into the pond and a naturally sustaining population quickly became established. Brown trout, a less viable fish in these waters, were last stocked in 1997.
 - i. **Streams** - A 2001 fish population inventory of Mill Brook on the WMA found the following species to be present and are listed in descending order of abundance: brook trout (*Salvelinus fontinalis*), blacknose dace (*Rhynichthys atratulus*), common shiner (*Luxilus cornutus*), creek chub (*Semotilus atromaculatus*), white sucker, yellow perch, slimy sculpin (*Cottus cognatus*), chain pickerel, pumpkinseed, and longnose dace (*Rhinichthys cataractae*). Fish population surveys conducted prior to this most recent one also found brown trout to be present but in low abundance. Downstream of the dam many of the same species also occur; albeit, brown trout are somewhat more abundant in this section of Mill Brook. Further downstream below the falls near Route 100 Atlantic salmon (*Salmo salar*) fry are stocked annually in the spring as part of the anadromous salmon restoration program in the Connecticut River basin. While stream habitat in this portion of Mill Brook is utilized by juvenile salmon and these up to the smolt stage, no salmon reproduction has yet to be documented in this stream. Adult salmon can reach Mill Brook from the West River.
 - j. **Lands adjacent to Wetlands and Water** – Areas surrounding wetlands, pond, streams, and rivers are crucial for a variety of reasons. They act as wildlife movement corridors, breeding and wintering habitat for amphibians, edge habitat for upland species, and help cast shade onto water surfaces to prevent wide temperature fluctuations. They also are important in decreasing sediment outputs.
- 3) **Other Quality of Habitat Concerns**
- a. **Non-Native Species** – Some exotic species can adversely decrease the diversity and productivity of communities. Gale Meadows WMA harbors the following ten species of non-native plants. Three (purple loosestrife, Japanese knotweed, and honeysuckle) are considered invasive and harmful:

- A number of the exotic species occur in the Shallow Emergent Marsh at the mouth of Mill River: purple loosestrife (*Lythrum salicaria*), common nightshade (*Solanum dulcamara*), burdock (*Xanthium strumarium*), ox-eye daisy (*Chrysanthemum leucanthemum*), purple vetch (*Vicia sativa*), black mustard (*Brassica cf. Nigra*), and thistles (two *Cirsium* species).
- Japanese Knotweed (*Polygonum cuspidatum*) growing around the old house and barn.
- Honeysuckle (*Lonicera morrowii*) growing scattered throughout the property.
- Helleborine (*Epipactis helleborine*), a non-native orchid present in most forested communities here.

Loosestrife, knotweed, and honeysuckle are troublesome invaders that can diminish the quality of the natural communities they colonize. If loosestrife could be eradicated from the mouth of Mill Brook, it may not invade the rest of the pond's wetlands. If knotweed could be pulled from the grounds of the old house, the pond may be spared a widespread infestation. Letting mowed riparian areas naturally revegetate may help to keep this species from further infestation as well. Helleborine is a ubiquitous forest weed but does not seem to pose a threat to native species or community health. The other exotic plants found at the mouth of Mill River are widespread but not, usually, troublesome weeds. Ideally, we could seek to eradicate them from the marsh, but this difficult task should be considered a low priority.

- b. **Core Forest** – Fragmentation is the breakup of contiguous forest into smaller isolated tracts. These tracts may be partially or completely surrounded by non-forested areas. When this circumstance occurs, there may be a significant long-term disruption or alteration of biological functions and values. The negative effects of fragmentation within a parcel depend partly on the severity of the fragmentation of the surrounding landscape. The Southern Green Mountain biophysical region is the most heavily-forested biophysical region in Vermont at 92% forested. However, this same region is so fragmented by roads, houses, powerlines, etc. that only 64% of the area is considered core forest. Adequate forest blocks are available within the biophysical region (Green Mountain National Forest to the West, Figure 6) to support forested wildlife species. Development adjacent to Gale Meadows degrades core forest attributes within the WMA (Figure 7 and Tax Map Appendix A). Connectivity with the core forest habitat on the Green Mountain National Forest is critical to maintaining species such as black bear and fisher for the long term.

- c. **Wildlife Movement Corridors** –

Black bear

No record of black bear crossings or motor vehicle collisions exists for any of the roads directly adjacent to or surrounding Gale Meadows WMA; however, there are road crossings documented in close proximity. The property is juxtaposed on the eastern edge of the black bear core habitat (See Bear Habitat Map, Figure 6). Bear core habitat extends to the south and west of the WMA, and efforts should be made to maintain connectivity to core habitats. The wetlands are likely spring feeding areas for bears in the area, and the maintenance of travel corridors would ensure access to these critical spring and fall food resources. No permanent roads or developed recreational facilities should be constructed

in areas where they would restrict movements by bears from the core habitat into these feeding areas on Gale Meadows WMA. Conservation of lands in the corridors, through easement or acquisition, should be a high priority.

Amphibians

Amphibian breeding sites on Gale Meadows WMA are designated for protective management. Smaller species such as amphibians also need conserved areas that function as travel zones between breeding habitats (i.e. vernal pools). Safe road crossing assistance on the Winhall Hollow road would also be desirable.

- d. **Cavity Trees, Snags, and Coarse Woody Debris** –Dead and down woody materials provide important habitat for a variety of wildlife from insects to fishers to flying squirrels.

Through the forestry divisions forest exam inventory system(FOREX), cavity trees, snags and coarse woody debris were tallied at each inventory plot.

Cavity trees are standing trees that may or may not be dead but do have a hollow center. These trees are vital for cavity-nesting birds such as woodducks and as den sites for raccoons and fisher. There are an average of six cavity trees per acre on this WMA, exceeding typical recommendations.

Snags are dead or severely unhealthy trees that are still standing. Usually there are no tops or canopy on these trees. Rotten wood is evident either in the main stem of the tree or in the branches. Many bird species, such as the pileated woodpecker, use these trees to forage for insects. There is an average of 13 snag trees per acre on the property, also exceeding typical recommendations.

When cavity or snag trees fall to the forest floor, they then turn into coarse woody debris (CWD). These structures provide habitat for small mammals and amphibians. Frequently bears will tear large dead logs apart looking for insects to eat. There are approximately seven trees per acre on the ground at Gale Meadows WMA. There are currently no standard recommendations for CWD in Vermont.

[Figure 7. Vermont Core Forest Areas Map.]

- e. **Forest Age-Class Diversity** – Many of the wildlife species found on Gale Meadows WMA require a variety of habitat conditions. Open fields, shrubland, and beaver flowages provide the more open habitat conditions favored by woodcock, moose, geese, many songbirds, deer, and bear. Young (sapling and early poletimber) forests offer abundant food and cover for species such as deer, moose, ruffed grouse, and chestnut-sided warblers. As poletimber grows into sawtimber and the older age classes, habitat is provided for such species as ovenbirds, blackburnian warblers, wintering deer, goshawks, and black bear (beech stands).

Statewide forest inventory data provide an assessment of the quality and distribution of the level of early successional habitat that is currently found within the Southern Green Mountains Biophysical Region. The 1997 survey data indicate that only 32,214 acres (3.7% of the forestland in the biophysical region) were in seedling/sapling stages; 226,974 acres (26.2%) were in poletimber stage; and 605,510 acres (70%) were in sawtimber stage. These figures indicate that the forests within this biophysical region are growing older. As a result, an increasing proportion of the forestland is meeting the habitat needs of species dependent on forests in the mid stage of development, while species requiring shrubland/earlier successional stages and older stages may be limited by the amount of available habitat.

Within Gale Meadows WMA, existing seedling/sapling stands and open fields total 15 acres (3% of Gale Meadows WMA's approximately 500 acres of forestland). A few wildlife species dependent upon early successional habitat conditions are documented as being in decline.

B. Land Use History Of The Local Landscape

In order to receive funds from the U.S. Fish and Wildlife Service, the Vermont Fish & Wildlife Department is obligated by Federal law to conduct an archaeological evaluation of its land holdings before management can be implemented. Two historic studies have been conducted on the property of Gale Meadows WMA. One was a pre-contact modeling analysis conducted by the University of Vermont Consulting Archaeology Program (CAP) and the other a historic assessment conducted by the Research Center at University of Maine at Farmington (UMaine). The full text of each report is available at the Agency of Natural Resources district office. The following is a summary of study results and of deed research by ANR staff.

Pre-contact Sites

Although human occupation of the region along the lower Connecticut River and its tributaries predates Euro-American settlement by several thousand years, there are no known Native American sites located within Gale Meadows WMA. CAP recently implemented a GIS-based Precontact Site Sensitivity Model which is based on current geological features in a landscape and proximity to other known sites. This analysis was performed for the Gale Meadows WMA. It indicates that the land on either side of Mill Brook would be of highest likelihood of precontact sites and, therefore, most sensitive. Because Mill Brook was dammed to create the pond, most of this area is now underwater and, therefore, protected from future disturbance. It is unknown how much disturbance took place during the pond construction process. The area around the dam was highly disturbed, possibly damaging sites.

Historic Period Contexts

There are five periods addressed in the report from UMaine. These are:

- Native American context
- Pre-settlement Period 1600-1780
- Early Settlement Pre-Industrial Period 1780-1850
- Industrial and Agricultural Intensification Period 1850-1900
- Industrialization – Post Industrial Period post 1900

Native American Context

This part of Vermont's history has received very little archaeological attention to date. There has only been one reconnaissance survey conducted by the U.S. Forest Service in the immediate area of Gale Meadows. Native American sites have been documented in the larger area associated with West River tributaries. The West River area is considered to have a relatively high sensitivity for Native American sites. Known sites have been dated between 4000 BC and 1600 AD.

Pre-settlement Period

Dominated by the fur trade industry, this period marked the transition between Native American and Euro-American cultural landscapes. Located at the headwaters of three major drainages – the West River, Otter Creek, and Batten Kill River – the area around Gale Meadows WMA is characterized by the transportation of people and goods over the Green Mountains. Highlighted is a report that documents a raiding party lead by Captain Melvin in 1748 that was caught by a pursuing war party at Salmon Hole in Jamaica. In addition, there are multiple references to a “mountain passage” that served as the transportation route between the Connecticut River and Lake Champlain in the vicinity of Gale Meadows WMA.

Early Settlement Pre-Industrial Period 1780-1850

This period is exemplified by subsistence farming and small-scale craft industries. The WMA lands were cleared for agricultural purposes in the late 1700s and early 1800s when land in Winhall was divided into family and business tracts. Roads and industry soon followed. The Winhall Hollow Road, for example, appears on the 1796 Whitlaw Map. The first mill was set up in Rawsonville in 1810. The population of Winhall during this period quickly grew with the development of new industries. In 1791 there were 155 people. By the 1840s, there were 576. The Peru Turnpike, now part of Route 11 and connecting Manchester and Londonderry, was completed in 1816. By 1840 Winhall had one tannery, one grist mill, seven sawmills, one store, and three taverns. Livelihoods for residents focused on livestock and the production of small grains, sugar, and wool. The iron industry and export of charcoal also contributed to the local economy.

Industrial and Agricultural Intensification Period 1850-1900

During this period, many land transactions took place within the WMA which subdivided farmsteads. As a result, many fields reverted to woodland. Farm abandonment can be attributed to the following developments: the introduction of the railroad and access to better lands; a shift from draft to steam and gas power; the use of machines better suited to gentler terrain in the south and mid-west; and economic opportunities in a growing factory economy in cities. Due to these and other influences, the population of Winhall began to decline after 1870, dropping from its peak of 842 to 202 by 1940.

Overall Summary of Historic Resources at Gale Meadows WMA

Through deed and map research, more details are available about historic events at Gale Meadows WMA. The current boundary of Gale Meadows WMA is the result of many complicated land transactions that have been traced back to the very early 19th century on portions of the property. The three historic districts identified are farmsteads from that era (Figure 8). All are connected by a road that follows the Tralee driveway to the house, goes into the pond, comes back onto land around the Thompson district, goes back into the pond, then comes back onto land by the landing/access area where it follows the current road to Haven Hill Road. The 1856 Rice and Harwood map does not show the road going past the Tralee District. However, the Beers 1869 map does show this road running all the way through suggesting that this road was built between this timeframe. The 1899 USGS also illustrates this road but the 1957 USGS feature this road as a trail (see Appendix C). In 1964, construction of the dam and excavation for the future pond site was started. However, prior to this project, the Greens put a considerable amount of time and money into acquiring adjacent land and obtaining permission and permits. When the first piece of the WMA was acquired in 1965, it consisted of the 195-acre pond and the 100-acre severed portion of the Thompson Lot.

The name of Gale has been associated with this property since the early 1800s. The Gale brothers, Levi and Horace, acquired the 175-acre ‘meadow’, which is now part of the pond and adjacent forested areas, for agricultural purposes from Asa Porter, who acquired it from the ‘Collector of Taxes’ in 1814. However Jacob Gale, presumably related, was also a collector of taxes as early as 1805, so part of the property may have been in the Gale family prior to 1814. At the time, there were two other homesteads in the neighborhood, called the Thompson and Prouty districts, of which only stone remains are found on the parcel. Of interest is a verbally-related story of Levi and Clarissa Gale, as told by George Adzima and Peter Castle. Clarissa, wife of Levi, died in 1845 at 33 years of age. Levi died in 1867 at the age of 62 years. Both were buried where the bridge crossed Mill River which is now under the pond. The headstones were removed and are currently in storage. Ownership by the Gale family was retained until the late 1920s. In the following 20 years, the property changed hands several times and for a period was leased out as a boy scout camp called *Hexonia*.

Gale Meadows WMA was conserved through the vision, dedication, and hard work of Henry and Alice Green who enabled the Vermont Fish & Wildlife Department to acquire the properties in and around Gale Meadows Pond. The Greens purchased the house and barn along with some acreage from a Boston physician in 1945 and affectionately named the old farmhouse and barn *Tralee*. They lived at Tralee seasonally and vacationed there from their New York residence for the next 51 years. The Greens increased the size of their property over the next 20 years by acquiring adjacent lands in 1947, 1957, and 1962 totaling approximately 485 acres. Motivated by a strong conservation ethic, they approached the Vermont Department of Fish and Game in the early 1960s with a proposal to design and build a pond for the purpose of wildlife habitat. To accomplish this, the Greens were willing to donate property and assist in procuring additional lands 50 feet above the proposed water level from adjacent landowners. A total of nine additional landowners participated in this endeavor, and the Gale Meadows Conservation Project started with construction of the pond in 1964. Finished in 1965, the new Mill Brook dam replaced an old bridge that had once created a small “ice pond”. This turned the pond into a 195-acre lake with an irregular 5.8 mile shoreline, of which the Greens owned 75% and the State owned 10%. In 1993, the Greens, with the intention of permanently conserving their land for the benefit of both people and wildlife, placed a Vermont Land Trust conservation easement on 194 acres of land while deeding over to the Fish & Wildlife Department an additional 191 acres. With the assistance of the Vermont Housing and Conservation Board and the Vermont Land Trust, further

acquisitions were made around the perimeter of the pond to secure a natural and undisturbed riparian zone along the shoreline. As a result of the untimely deaths of Henry and Alice Green in 1996, the remainder of their land holdings and the house and barn were given unexpectedly to the Vermont Fish & Wildlife Department in 1997 through the Last Will And Testament of Henry and Alice Green. Both buildings inherited, by the Fish & Wildlife Department, were built in the early 1800s by the Gale family and served many generations of Gales who farmed the adjacent property. Their legacy conserved 707 acres, the third largest water body in southern Vermont, and placed 95% of the shoreline in public ownership.

The basic construction of the house and barn consist of stone slab foundation walls with slate roof shingles. The house is a large two-story residence with wood clapboards on the exterior and “balloon” type framing. In 1997, engineers inspected and reported on the current conditions of the house and barn. Some maintenance activities have occurred since that time and will continue until a definite plan has been approved and implemented for the structures.

Each of the three historic districts has an old sugarbush, rock foundations, stonewalls, and many other associated features (Figure 8). Near the Thompson district, the old sugarbush contains the remains of a sugarhouse with an old style sugar arch. Near the foundations within the Thompson district are apple trees, stone cellar holes, stone foundation piers, stonewalls, and a stone-lined dug well. The Prouty district is similar but lacking the well. Instead, two small retaining ponds were found just to the west of the old homestead foundations. Near this district there are a high concentration of stonewalls that could be interpreted as corrals or pens for livestock, or to keep livestock out. This area was bought by the Greens in 1962. Shortly after acquisition, the Greens decided to renovate the Prouty farmstead which burned to the ground before completion. The Tralee district is very similar to the others with the exception that the house and barn are still intact after the almost 200 years. A stone-dug well is found south of the barn as well. Of interest is a garbage dump area to the south of the house which, by visual inspection, seems to have served the inhabitants of the house throughout the years. In this area lies a piece of farm machinery with Bellows Falls Machine Company printed on it. A quick query as to the date of the manufacturing company suggests that it was founded in 1886, but no records were found as to its termination. There are over four miles of stonewalls on dry land within the property. Several stonewalls continue into the pond.

The following is an acquisition history of Gale Meadows WMA. There is a plaque at the dam and access area commemorating the participants of the original 1965 purchase for their efforts put forth in the creation of the pond (Figure 9).

Date	Lot # on Map	Grantor	Estimated Acres
1965	38	Henry and Alice Green	225
1965	27	Nina Norse	9
1965	1	Johnson Lee	6
1965	44	Vermont Ventures	2
1965	2	Henry B. Mosley	1
1965	31	H. O. Smith and N. M. Smith	2
1965	26	Myron and Kathleen S. Wright	35
1969	4	Ford	32
1984	28	Stratton Corp.	10
1994	39, 45	Henry and Alice Green	194
1997	35, 37, 58	Henry and Alice Green	191

Henry and Alice Green Residence

In 1997 the Vermont Fish & Wildlife Department unexpectedly inherited a homestead and surrounding 191 acres from Henry and Alice Green. The homestead consists of a home, a barn, and several small outbuildings and was named Tralee. Situated on a knoll overlooking Gale Meadows Pond, the 4500 sq. ft. clapboard-sided house consists of three stories and twelve rooms, one and a half baths, a large loft, an attached carriage shed, and a kitchen/pantry. There is a partial stone foundation beneath the building, and a full attic and slate roof above. The configuration of the house could lend itself to a variety of uses such as living quarters, office space, and conference and seminar space. In close proximity to the house is sited a 19th century, post-and-beam barn. Like the house, the barn is resting upon a stone foundation and is topped with a slate roof. At present, this 60' x 50', two-story structure is unpartitioned inside and, therefore, offers the largest enclosed space within the homestead area.

Since 1997 the Fish and Wildlife Department has attempted to secure funding for upgrades while performing minimal maintenance activities on the house and barn to minimize deterioration including:

- a thorough cleaning of the house and attic
- the repair of slates on the house roof
- contracted with private engineering firm to inspect buildings and report on current condition and provide estimate for maintenance and improvement
- the boarding of windows
- the painting of several exterior walls of the house
- the repairing of downed electrical wires
- the removal of hazardous trees from around the buildings and the access road to the homestead
- the annual mowing of fields around buildings and adjacent to Winhall Hollow Road
- the application for funding via Vermont capital budget (not approved)
- the development of a "Request for Proposals" (This was not sent due to other potential funding opportunities which ultimately fell through.)

In 1997, Fish and Wildlife had the house inspected by an engineering firm and again in 2002 by State Facilities engineers to determine both the short- and long-term maintenance and construction needs of the house and barn. The following is a brief summary of their findings:

- Plumbing system does not meet the National Plumbing Code or Vermont Labor and Industry Standards. Plumbing needs to be replaced and hooked to the drilled well. The condition or type of septic disposal field or system is not known but likely does not meet requirements.
- Interior wastewater plumbing does not meet the National Plumbing Code or Vermont Labor and Industry standards. Waste lines need replacement.
- Electrical panel in main entrance needs to be upgraded from 70 amp to 100 amp service.
- No central heating in house. Two unlined chimneys in poor to fair condition. They need to be repaired, repointed, and have a liner installed. House needs to be insulated and meet the requirements of the Vermont Standard for Energy Conservation.
- Foundation and building itself appears to be in fairly good condition.
- Interior paint is most likely lead based.
- Barn is in fair condition.

The 1997 estimate to improve house to current living standards was \$60,000 not including septic system, powerline, access road, or costs associated with lead paint removal. The barn would require an additional \$25,000 for structural improvements and maintenance.

Unfortunately these buildings are currently not restricted from public access and are visited frequently. Significant damage has been done to these structures by some individuals. The property will need a high level of maintenance and oversight to last into the future.

Unfortunately, the Department of Fish & Wildlife has not had funds or staff to adequately upgrade the buildings for public use. As a result, the department presented the following options for the house and barn to the public at the public involvement meeting in 2004:

1. Long-range, year-round use as an educational center, a retreat or a similar activity or use. This would involve hiring an architect to initially develop options and preliminary cost estimates. Funding has been the limiting factor. A significant level of state dollars would be necessary to upgrade the house for public use which, to date, have been unavailable.
2. Lease the house and barn to a conservation organization with a clear agreement regarding responsibility and liability to maintain property as a public resource (see below).
3. Sell or donate the house and barn to another environmental organization or a land trust.
4. Sell the house and barn to be removed and relocated. This work would need to be done in cooperation with the Vermont Division of Historic Preservation and includes filling, grading, seeding, and mulching all disturbed areas after the structures are removed and in accordance with the easement and the deed.
5. Have the house and barn deconstructed for salvage per guidelines in 4 above.
6. Do nothing and continue to incur the liability, including unsafe conditions for public use.

The department believes this property could be maintained in a way that implements the Green's wishes and conforms to the mission of the Fish & Wildlife Department. This could be done most effectively by leasing the buildings to another conservation organization with the following parameters imposed:

- The surrounding property would be managed for wildlife and forest resources; therefore, proposed uses of Tralee must be compatible with those management objectives.
- The house and grounds would be used for low density/low impact public use and education. Uses would specifically avoid impacts to wildlife particularly nesting birds and waterfowl on Gale Meadows Pond in compliance with the deed and with the goals and objectives of the Fish & Wildlife Department.
- Developed private access to the pond from the Green property (ramp/docks/beach) would not be allowed. Disturbance along the shoreline would be minimal and a buffer of at least 50 feet of natural shrubs will be restored along the water's edge.
- In keeping with the Green's land ethic, the property should be used in a manner that promotes a land stewardship ethic and the conservation and appropriate use of Vermont's terrestrial and aquatic communities.

- Year-round public access (vehicular) would be restricted to the access road and areas away from Gale Meadows Pond to minimize human disturbance around the pond in critical areas.
- Modifications to structures and grounds (including proposed trails, etc.) would require written consent from the Department of Fish & Wildlife and Vermont Land Trust.
- Opportunities would be provided for collaboration with state and private natural resource organizations both through educational opportunities and options for meeting space.

The department collected input and suggestions from the public regarding the six management options presented at the meeting. The public seemed in favor of any action other than the current situation of “mothballing” the buildings and doing repairs when vandalized. No one option was favored by the public. The “take-down” was seen as a last resort. There was only mild interest in leasing the structures to a private party

On November 16, 2005, District staff met with the Agency of Natural Resources Lands Stewardship Team to discuss options for the Tralee complex. The decision was made to first attempt to lease the buildings in a “conservatorship” fashion to a conservation organization that would be complementary to ANR management of the area and allow ANR to maintain public access. The consensus was that if this effort failed, the buildings should be removed, in consultation with the Division of Historic Preservation, and the grounds restored as a safe public area.

[Figure 8. Historic Resources Map.]

[Figure 9. Acquisitions Map.]

C. Recreational Assessment

Recreation Overview – Gale Meadows Wildlife Management Area features the man-made 195-acre Gale Meadows Pond which is the third largest body of water in southern Vermont. This WMA is located on the eastern side of Bennington County within 15 miles of Manchester Village. The area is a very popular and busy year-round tourist destination. Gale Meadows is also located close to Stratton and Bromley ski areas which attract skiers during the winter and tourists during the fall and summer. Gale Meadows is surrounded by several vacation home developments with numerous houses located directly adjacent to the WMA boundary. The accessibility of this property to many people and the scarcity of lakes or ponds in this region of Vermont result in a high level of water-based recreational use on portions of this property (Figure 10).

Deed restrictions prohibit all motorized recreational activities, including snowmobiling, over the 512 acres of WMA wetlands and uplands. Most commercial activities are prohibited on wildlife management areas.

Two very different categories of recreational experiences are available at Gale Meadows WMA. The fishing access area is characterized by substantial modifications to the property including a parking lot, boat launch, dam, bulletin board, and informational signs. This area is heavily used by people especially on weekends and holidays during the summer. Sights and sounds of people recreating are readily evident at the access area and on portions of the pond including activities such as motor boating. The otherwise undeveloped shoreline, dead tree snags, floating bogs, and views of surrounding mountains give this pond a remote feel and appearance. The irregular shape of the pond allows boaters the opportunity to get away from other recreational users.

The forested portion of the property surrounding the pond provides visitors with a more remote recreational experience away from crowds in a natural appearing environment. Contact with other users is low; however, evidence of other users is prevalent. Woods roads and trails are found in this area. Timber harvesting and wildlife management practices are allowed. Motorized recreation is not permitted in this area. The bulk of this area is located within ½ mile of a town road.

Access Area – This area was constructed by the Vermont Fish & Wildlife Department in 1965 as part of the Gale Meadows impoundment project with funds derived from taxes on fishing equipment and motor boats. The access area is primarily used for the launching of boats for fishing and for the parking of vehicles and boat trailers used by people engaged in fishing. The area can also be used for the launching of any petroleum-powered inboard and outboard boats and for hunting, fishing, and trapping activities. Maintenance of this area is conducted by the Vermont Fish & Wildlife Department. The Gale Meadows access area has been identified by the Fish & Wildlife Department as a Watchable Wildlife site where good birding opportunities are available. Boat storage is prohibited at the access and dam area. Swimming is also prohibited at the access and dam area. Conflicts between users at the access area occur and have been a source of public complaints. Anglers use the facility less frequently than in the past due to high numbers of recreational kayaks and canoes on the waters and being loaded and unloaded from the access area. At one time, storage of dozens of boats had congested the parking area. People swimming and picnicking at the access area also conflict with anglers. Users also complain of dogs roaming freely at the access area and a lack of public facilities.

[Figure 10. Recreational Opportunities Map.]

Gale Meadows Pond – This scenic 195-acre pond is the focal point for recreational activity on the property. Canoeing, kayaking, fishing, and wildlife viewing are very popular activities here. The relatively undeveloped shoreline, numerous dead snag trees, floating bogs, and views of the surrounding mountains give this pond a remote back-country feel and appearance. Gale Meadows Pond is large enough to make it an enjoyable location for boaters to spend several hours paddling and exploring. Swimming can occur anywhere except the access area and dam. The dam was built by the Fish & Wildlife Department in 1965. The dam spillway required maintenance in the mid 1980s.

Under Vermont Water Resource Board rules, motorboats are allowed on the pond but boat speed is not to exceed 5 miles per hour. Personal watercraft (jet skis) are prohibited. Float planes are allowed to use the pond under Water Resources Board rules.

Winter recreation centers on fishing and skiing. Snowmobiling is a popular activity as well. ATVs are allowed on the ice for fishing purposes only. Snowmobiling and ATV use are not allowed on any shoreline or other portion of the property with the exception of the boat launch and access road, where snowmobiles are allowed winter use. Dog sledding is a new addition to the winter recreation spectrum in recent years. No conflicts or complaints have been documented between other users and dogsledders. There is concern about these uses occurring on the south finger of the pond due to deer wintering nearby.

Fishing, Hunting, and Trapping – Gale Meadows Pond features largemouth bass, yellow perch, chain pickerel, and brown bullhead fishing opportunities. Some anglers expressed concern about the increasing numbers of kayakers, canoeists, and swimmers using the boat launch and have stopped going to the pond to fish. The woodlands around the pond are popular for deer, ruffed grouse, and snowshoe hare hunting. Ducks and geese are also hunted on the pond and surrounding marshlands. Trapping for muskrat, beaver, and other furbearers also occurs on the property. Posted property and subdivisions in the immediate area around Gale Meadows WMA make this property more valuable as a place where traditional uses can still be enjoyed by the public.

Hiking Trail – Currently there are no officially designated or maintained hiking trails on the property. A trail approximately $\frac{3}{4}$ mile in length has been created by people through continued use along a section of the shoreline. This trail starts at the public access area, goes past the plaque in honor of the Greens, and follows the pond perimeter to the peninsula across from the Tralee buildings. This trail is not signed or blazed but receives a large amount of foot traffic and is considered compatible with the purposes of the property.

Snowmobiling – Deed restrictions prohibit snowmobiling on the 512 acres of forestland and wetlands comprising Gale Meadows WMA. However, snowmobiling is allowed on the pond and access area for fishing purposes only.

Several snowmobile trails were observed on the property during a site visit in March of 2003. What appeared to be a local use snowmobile trail was observed crossing state land to provide access to the northeast side of the Gale Meadows Pond. Another very low use, unimproved trail crossed the dam area, continued through the Thompson Lot, and connected to the previously mentioned trail. Not an official VAST trail, it was closed in the winter of 2004 due to legal constraints. Although there are no officially-designated VAST snowmobile trails on the property, the road to the public access area and the pond receive a large amount of snowmobile use.

Mountain Biking – There are no officially designated mountain bike trails on the property. However, what appears to be a short section of a mountain bike trail crosses through the southern most portion of the Gale Meadows property. It appears that the public access area is used as a starting point for this trail. Neither the bike trail nor the parking of vehicles at the access area for the purpose of mountain biking are allowed uses. It is not known how long the trail has been in use or if a local organized club is involved. There is extensive damage to natural resources, including soil erosion and tree cutting resulting from activities related to this illegal trail.

Ford Lot – The 32-acre Ford Lot limits certain uses via deed restrictions. Hunting or trapping of birds or animals, and the transporting or use of firearms are not permitted on the property. The donors of this land wanted it kept in its natural state as a wildlife refuge.

D. Timber Resource Assessment

History of Timber Management – The forest stands at Gale Meadows WMA began like most forests in this area – as abandoned fields from the late 1800s and early 1900s on more moderate slopes and as cut-over forests on the steeper slopes or rougher ground. There is little evidence of timber management or tree cutting being conducted in the last 60 years. The scattered older trees and stands of older trees at Gale Meadows WMA are either maples left in areas used as sugarbush years ago or are scattered residual un-merchantable trees from commercial harvests in the early 1900s. It is only in the last 30 years that trees have reached a size and density where timber management would be beneficial. Because little thinning has been done, many coniferous stands are overstocked, while hardwood stands have a great number of dead and dying trees.

Current Status of Timber Resources – Gale Meadows WMA has a mixed forest composition typical of this area as influenced by soil types, slope direction, soil moisture, and past land use. The terrain of Gale Meadows WMA is variable but in many areas is favorable to conventional systems of timber harvest.

White pine stands are most common on former pasture or open land. Sugar maples are typically found on better quality soils with chunks of limey stone mixed in the soil or in areas previously cultivated for sugarbush years ago. In areas that are more marginal in their site quality, hemlock, red maple, spruce, and balsam fir are found.

The forest composition features four principal forest cover types as discussed below:

Northern Hardwood – Makes up 38% of the forested acreage. These stands typically contain a high percentage of sugar maple. However, where soils are poorer, red maple becomes dominant. Other common tree species are white ash, beech, black cherry, hemlock, and yellow birch. Occasional groups of aspen and white birch are found. Stems in hardwood areas generally range from 10 to 20 inches in diameter. The quality of the trees is medium although some areas of exceptional trees can be found. Due to a lack of management and past insect and disease problems, some areas have more dead standing or fallen trees than is typical for hardwood stands in Vermont. Where healthy beech and cherry can be found, there is evidence of use for feeding by black bears. Soils and tree quality can support a number of management approaches and should yield good results in overstory trees. Dominance of poor quality established regeneration of beech and red maple and hayscented fern colonies will offer a challenge to creating a diverse mix of seedlings in the understory as these few species are already well established.

Eastern White Pine – Makes up 35% of the forested acreage. White pine stands are some of the most striking on the parcel with respect to potential for timber harvest. White pine is growing in association with red maple, red spruce, balsam fir, and other species. This species is typically the highest timber quality species in the stand and should be a featured tree in the composition after thinnings. These stands are typically very dense with trees to the point growth has stopped in many and the process of trees dying and falling out of the stand has begun. South of the pond poor quality red maple is the most dominant associate due to wetter ground. On the north side where soils are better, white pine is more dominant and of better quality. Reproduction in the southern stand is typically beech and red maple, while in the northern stand established balsam fir and spruce seedlings are most common.

Eastern Hemlock – Makes up 16% of the forested acreage. Eastern hemlock occurs throughout the property in varying amounts. There are two areas where hemlock is dominant in the northwest section. As is typical, it is found in areas where soils are wetter and stonier and temperatures cooler. The quality of the trees in these areas tends to be poor with evidence of poor growth, ring shake in the wood, and decay. The ground is more difficult to operate there than in other parts of the WMA. One section is difficult to access due to a large stream. Given the lower quality site and poor quality of the dominant trees, timber potential is low. Where timber management is appropriate, it should focus on encouraging new growth of eastern hemlock seedlings.

Red Spruce – Balsam Fir – The spruce-fir type occupies 10% of the forestland in a low, wet area with soils that are shallow to a hard pan. Trees here are of reasonably good quality, but decay in balsam fir and decline in red spruce crowns are concerns. The shallow soil can result in blowdowns with or without harvest.

Economic Benefits – Although economic return does not take precedence over wildlife habitat management, conservation, and protection of natural communities on ANR lands, timber harvests that result from wildlife management recommendations yield economic benefits. For example, a controlled harvest to improve wildlife habitat for 200 acres in the first 10-year period would yield an anticipated harvest volume of 500 MBF of softwood and hardwood timber and 400 cords of pulp and firewood. The economic benefit of these harvests comes in two forms. First, in the employment created for the crews harvesting the timber and secondly from the mills processing the timber into lumber. An estimate of *value added* to Vermont's economy due to harvests that could be done on this WMA, based on 2004 prices, over 10 years is between \$300,000 and \$500,000.

Forest Inventory Summary

Management Unit: Gale Meadows WMA Forex Inventory Summary, 2002

Compartment	Stand	Acres	MSD	BA/A* Total	Acc. BA/A	Unacc. / BA/A	Cull BA/A	Site	Timber Type	Species % BA	Estimated Volume/Acre	Access Via
1	1	87	10.2	143.5/ 115.5	84.5	22.5	36.5	1	Northern Hardwood Hemlock	Red Maple 38 Hemlock 20 S. Maple 10	3.8 MBF 10 Cords	Lake Road
1	2	42	7.6	141.3/ 112.5	106. 3	15	20	1-3	Red Spruce- Balsam Fir	Red Spruce 30 Balsam Fir 27	2.3 MBF 5 Cords	Haven Hill Road
2	1	86	14	150/ 135	81.4	22.9	45.7	1	White Pine	White Pine 38 Red Maple 39	9.8 MBF 5 Cords	Haven Hill Road
2	2	7	14.5	125/ 112.5	52.5	35	37.5	1-2	Northern Hardwood	S. Maple 64 Red Maple 14	4.6 MBF 11 Cords	Haven Hill Road
2	3	8	7.3	140/ 140	0	80	60	1	Pioneer	Bl. Cherry 57 Red Maple 28	22 Cords	Haven Hill Road
3	1	60	12.7	166/ 130	140	23	3	1	White Pine	White Pine 47 Red Maple 23 Red Spruce 11	13.4 MBF 13 Cords	Green Road
3	2	66	12.3	136/ 104	104	22	10	2-3	Hemlock	Hemlock 30 Red Maple 26 Y. Birch 26	6.2 MBF 13 Cords	Green Road
3	3	22	14.7	135/ 115	75	16.7	43	1	Northern Hardwood	S. Maple 36 White Ash 27 Beech 21	4.6 MBF 7 Cords	Green Road
3	4	45	12.2	134/ 112	87	30	17	1 & 2	Northern Hardwood	Red Maple 37 Bl. Cherry 14 Beech 9	4.6 MBF 12 Cords	Green Road

* total basal area
dominant-codominant

Soil Productivity Guidelines

Forest site classes are used in this plan to express potential for forest productivity and for vegetative management (Figure 11). Forest site classes were developed through research to reflect the relative degree to which trees grow on a particular soil type. Site classification for Gale Meadows is based on the USDA's Windham County Soil Survey. This soil information considers soil potential, soil limitations, slope, surface features, and soil depths. The following map locates these various site classes as they occur in this management area. Soils, site class, and slopes are all important information when considering which tree species to favor for growth and how intensive the management effort should be.

Forest site classes can be used for broad planning purposes. However, on-site investigations are recommended to assess variations in site conditions including slope variations, especially those in the E slope which range from 35% to 60%. A thru E subscripts represent percent slope and are defined as:

A	less than 3%
B	3 to 8%
C	8 to 15%
D	15 to 35%
E	35 to 60%

As a general rule, commercial harvesting operations, as known in the Northeast, can easily be accomplished on slopes up to 35%. Additional care and planning are required on slopes up between 35% and 50%. Slopes of 60% and over are often considered inoperable.

Broad Forest Type Entry Level Interval Table

Each site class is associated with a recommended level of management. For example, land of site class 1 grows trees more rapidly than class 3 and, therefore, can be more intensively managed. The table offers guidelines for entry intervals on the WMA.

Forest Site Class	BROAD FOREST TYPE ENTRY* INTERVAL IN YEARS	
	Northern Hardwood	White Pine
1	15	10
2	15 - 25	10 - 15
3	25 - 35	15 - 25
4	35 - 50	25 - 30

*Entry is defined as the minimum interval in years before a particular stand of trees will need to be thinned again in order to maintain a constant growth rate and vigorous trees.

[Figure 11. Soils and Productivity Map.]

E. Legal Constraints Assessment

There are a number of legal constraints that affect the stewardship of Gale Meadows Wildlife Management Area (Figure 12). They include: deed restrictions, land use restrictions and conditions, and conservation and utility easements. In order to assess the effects that these legal constraints have on implementation of a long range management plan, it is important to understand the specific details of the different types of legal constraints that apply to the WMA.

Gale Meadows WMA is comprised of a number of individual land parcels that have been acquired by the State of Vermont since 1965. These parcels were acquired by the Vermont Fish and Wildlife Department using a variety of funding sources or through individual donations and land exchanges. The initial acquisition of the pond and Thompson Lot were through donation from Henry and Alice Green. This original parcel of land was given to the state with several restrictions already in place (i.e., spring rights, rights-of-way, etc.). Upon transaction, new deed restrictions were added such as additional rights-of-way for access purposes.

Since 1987, the Agency of Natural Resources has received most of its funding to acquire additional properties within the Gale Meadows WMA from the Vermont Housing and Conservation Board (VHCB). VHCB, a quasi-governmental board charged with overseeing the Vermont Housing and Conservation Trust Fund, was created by the Vermont legislature in 1987 for the dual goals of providing affordable housing and conserving lands with important resource values in Vermont. The VHCB requires that all conservation projects they fund are protected in perpetuity by legal instruments (conservation easements) recorded in the land records. The easements on Gale Meadows WMA are held by the Vermont Land Trust which is an active partner in the conservation of this property.

All of the conservation easements on the individual properties that make up the Gale Meadows WMA require that the state develop a long range management plan for the parcel. The conservation easements for this parcel do not regulate the types of forest management activities that occur; however, they do address the types of development, signage, and recreational activities that can occur such as non-motorized versus motorized recreation, commercial activities, etc. They also address the public's right of access and when such access should be restricted.

Summary of Major Legal Constraints

- 1) **Thompson Lot and Pond Site Parcel** – This area was the original 225-acre parcel donated to the Department of Fish & Wildlife in 1965 for the creation of the pond. Acquired from Henry and Alice Green with some deed restrictions on use, these include a 5-mile per hour speed limit on the pond, access rights to the pond, and a restriction that the Thompson Lot remain in a natural state forever.
- 2) **Johnson Lee Parcel** – The Department of Fish & Wildlife acquired this 6-acre tract of land in Londonderry for the purpose of constructing a dam impoundment. That tract now functions as the public access area. There is a three rod right-of-way associated with the parcel that connects this area to Haven Hill Road for public access. Deed restrictions include water rights and a right-of-way across the impoundment for the Grantor. Included is the right-of-way for the Fish & Wildlife Department to access the Thompson Lot across the impoundment for management purposes.

[Figure 12. Legal Constraints Map.]

- 3) **Vermont Ventures Pond Parcel** – The Vermont Department of Fish & Wildlife purchased a subdivided 2-acre lot from the Vermont Ventures Development Company in 1965 that was going to be partially flooded by the creation of the pond. The grantor reserved the right to access the pond for swimming purposes only.
- 4) **Wright Parcel** – This 34.6-acre parcel was acquired by the Vermont Department of Fish & Wildlife in 1965 for the development of the pond. The deed conveys a right-of-way to the Fish & Wildlife Department for access to the proposed dam impoundment. The Grantor reserves the right to access the pond for swimming and boating purposes and allows no building or maintenance or structures and no water skiing on the waters of Gale Meadows Pond.
- 5) **Smith Lot and Boundary Agreement** – The Vermont Department of Fish & Wildlife acquired this 2.2-acre parcel in 1964 that was going to be partially flooded by the proposed pond. The grantor reserved crossing rights. In addition, there is a conveyance by Smith to the Greens in 1979 establishing a common boundary.
- 6) **Vermont Ventures South Lot** – The 3.1-acre parcel at the southeasterly section of the property was bought by the Greens in 1969 for access purposes and is subject to a list of restrictions that are associated with the local development by Vermont Ventures, Inc.
- 7) **Ford Natural Area** – In 1969, Mr. and Mrs. Ford donated a 32-acre parcel to the Vermont Department of Fish & Wildlife to be designated as a wildlife refuge to remain in a natural state forever. This management plan for Gale Meadows WMA has incorporated this parcel into this management plan and will reflect the interests of the Fords in the management of these 32 acres.
- 8) **Smith Meadows Development** – The Stratton Corporation deeded this five lot 10-acre subdivision to the Vermont Department of Fish & Wildlife in 1984 as mitigation for development. These lots are subject to easements for viewshed purposes, pedestrian access, and a construction easement.
- 9) **Conservation Restrictions** – In 1994, the Greens sold 194 acres on the east and south sides of the pond to the State of Vermont. Associated with that exchange is an easement that was developed by the Greens, VHCB and the Vermont Land Trust, for the purpose of conserving the natural integrity, environmental and ecological values, and public recreational opportunities on the property. Restrictions on what can and cannot be done within the boundaries of the protected property are clearly outlined. Please refer to Appendix B for details.
- 10) **Conservation Restrictions** - In 1997, the Greens distributed an additional 191 acres on the west and north sides of the pond to the State of Vermont upon their deaths. Associated with that exchange is an easement that was developed by the Greens, VHCB, and the Vermont Land Trust for the purpose of conserving the natural integrity, environmental and ecological values, and public recreational opportunities offered on the property. Restrictions on what can and cannot be done within the boundaries of the protected property are clearly outlined. Please refer to Appendix B for details.

Additional Property Rights and Restrictions

- 1) **Utility Easements** – There are five deeded utility line easements held by Central Vermont Public Service and New England Telephone and Telegraph Company. These are located along the Winhall Hollow Road and on the northern most section of the Ford parcel. These easements date back to the 1940s.
- 2) **Access Right-of-way** – The state acquired a three rod right-of-way for public access to, and construction purposes of, the dam in 1969 on the Johnson Lee parcel.
- 3) **Spring Rights** – There was an agreement in 1986 between the Greens and an adjacent landowner to access the Green's property to utilize and maintain a water spring and water line to supply water to the premises of the adjacent landowner. It is not known whether the spring is still in use.
- 4) **Water Rights** – The VLT easement references the water rights of upper and lower riparian owners along Mill Brook and the right of use of the water within the brook and natural flow.
- 5) **Fence Obligation** – This is an obligation that was agreed upon in the late 1800s between David Gale and Gilman Thompson that was designed as a maintenance obligation for a fence that divided the two properties. It is believed that these two properties are now combined and part of Gale Meadows WMA and, therefore, the obligation is not applicable.

V. Management Strategies and Actions

Four categories of management have been identified for the lands administered by the Vermont Agency of Natural Resources (ANR). These categories indicate where different levels of use or types of management will be emphasized on the land. In this section of the plan, the recommended levels of use or types of management will be shown for all the land area in this parcel. This section also describes generally how the land will be managed so that the activities occurring on the land are compatible with the category assigned. The four categories are: (1) Highly Sensitive Management; (2) Special Management; (3) General Management; and (4) Intensive Management.

As part of the planning process, the lands, resources, and facilities held by the ANR are evaluated and assigned to the appropriate land management category. Assignment of management categories for Gale Meadows WMA is based on a thorough understanding of the resources identified and the application of the overarching lands management standards presented in the introduction section of the plan. The resources include natural communities, plants, and wildlife as well as recreation, historic, timber, and water resources. The 11 lands management standards or principles (found in the introduction of this plan) include maintaining biodiversity and involving the public, as well as implementing legal constraints, such as easements, wherever they are applicable.

A. Definitions of Land Management Categories (Classification)

- 1) **Highly Sensitive Management** – An area with uncommon or outstanding biological (including wildlife habitat), ecological, geological, scenic, cultural, or historic significance where protection of these resources is the primary consideration for management. Human activities and uses should not compromise the exceptional feature(s) identified.
- 2) **Special Management** – An area with unique or special resources where protection and/or enhancement of those resources is an important consideration for management. These areas do not require the same level of protection given to highly sensitive areas and may be intensively managed for specific purposes. However, vegetative management for timber and wildlife habitat, roads, and recreational activities should not compromise the unique or special resource(s) identified.
- 3) **General Management** – An area where the dominant uses are vegetative management for timber and wildlife habitat, concentrated trail networks, dispersed recreation, or other general land uses. In these areas, a primary management consideration is minimizing conflict between the activities, as well as with lands categorized as more sensitive where they are adjacent to a general management area. In addition, more sensitive resources that occur within these areas may require special attention.
- 4) **Intensive Management** – An area that is easily accessible and characterized by a high level of human activity and high intensity development on or adjacent to state land. Aesthetics and safety are the primary management considerations in these areas. However, more sensitive resources that occur within these areas may require special attention.

[Figure 13. Land Use Classification Map.]

B. Management Strategies

Readers are encouraged to refer to the resource assessments section for details on each of the various resources being managed in this section.

1) **Highly Sensitive (8 acres)**

1.1A) **Dwarf Shrub Bog Islands** (*map reference 1.1a*). There are five islands on the north end of the pond that comprise approximately three acres. These islands provide examples of some rare plants in southern Vermont and are considered important habitat for a variety of mammals, birds, amphibians, and fish. Wood duck boxes located on the islands have been successful in past years.

Extensive recreational activities such as boating, hunting, and fishing occur around these islands. Negative impacts to the islands themselves seem to be minimal suggesting that few people, if anyone, walk on the islands which are wet and spongy.

Implementation:

- a) The health of rare plant species on the islands will be monitored.
- b) Educational signs may be placed if there are any impacts from increases in recreational uses.
- c) Wood duck nesting boxes will be maintained as needed.

1.1b) **Hemlock Swamp** (*map reference 1.1b*). There are two examples of this natural community type on the westerly side of the property that comprise approximately 5 acres. Hemlock swamps are rare in southern Vermont. Stonewalls are found adjacent to the larger swamp. The smaller swamp has stonewalls and fenceline encircling the perimeter suggesting it was left as a woodland in the initial clearing for settlement.

Implementation:

- a) No timber harvesting will occur in these rare communities.
- b) There will be no disturbance to stonewalls.
- c) Non-motorized pedestrian recreational activities such as hunting, hiking, snowshoeing, and cross-country skiing are allowed. Recreational uses will be monitored. No trails will be constructed in this area. Motorized vehicles, mountain biking, and camping are prohibited.
- d) Buffer hemlock swamp and associated riparian areas according to District buffer considerations.

2) **Special Management (463 acres)**

2.1a) **Historic/Cultural Forests** (*map reference 2.1A*). Areas found to have old foundations, stonewalls, and signs of previous homesteads. Three historic districts were identified and comprise a total of 40 acres.

In the northwestern portion of the property is the Prouty District. This area is adjacent to the Winhall Hollow Road which is also an historically-important road in the area. In the center of the property on a peninsula of the pond is the Tralee

Historic District where the Greens lived seasonally in the old Gale family homestead. The house and barn have been there for about 200 years. On the eastern side of the property, near the access area, is the Thompson District.

Implementation:

- a) Develop a conservatorship agreement with a conservation organization to use and maintain the Tralee buildings and grounds (the Green property). Due to conflicts with public uses, they will not be leased or sold to private individuals for use on site.
- b) If Tralee conservatorship is not successful, work with Historic Preservation Division to move the buildings to another location, public or private, or destroy the buildings.
- c) Staff will follow Historic Resource protocols for vegetative management.
- d) Any town road activities that might impact the area will be minimized through coordination with the Town of Winhall.
- e) The use of metal detectors and removal of stone or artifacts is prohibited.
- f) Features within these sites that pose a risk to the general public will be evaluated with assistance from the Vermont Division of Historic Preservation and remedied. This will occur on an “as needed” basis.
- g) Dispersed, non-motorized pedestrian recreational activities such as hunting, trapping, wildlife viewing, hiking, snowshoeing, and cross-country skiing are allowed.
- h) Recreational uses will be monitored to identify any negative impacts to these areas.
- i) No new roads will be constructed in these areas and motorized vehicles, mountain biking, and camping are prohibited.
- j) Tree removal will be used to remove hazard trees, maintain the Tralee complex, release old apple trees, and improve wildlife habitat.
- k) Mowing fields will continue. However, a 50-foot strip will be left to revegetate along the pond shoreline within the Tralee District. This strip will be monitored for exotic plants. Should they develop, their removal or renewed mowing may be needed. Geese feeding on grasses here should still be able to access the area.
- l) Continue to inventory and map historic artifacts through the use of volunteers and/or as funding allows.
- m) Develop partners who can provide information for the public re: the agricultural heritage of the property.

- 2.1b) **Water Resources (*map reference 2.1B*)**. Gale Meadows Pond comprises 195 acres of the WMA within the water resources category. Use of the pond is managed by the Vermont Water Resources Board (see recreation section of this plan). District staff have responsibility for protecting water quality and wildlife habitat and managing recreational uses and impacts. Stonewalls are present under the pond’s surface.

Implementation:

- a) Fishing, hunting, and trapping are allowed here.
- b) Stumps just below surface level of the pond provide wildlife habitat and will not be removed. People should be cautious in these areas.
- c) Maintain current water level in the pond.

- d) Investigate methods for control of Japanese knotweed and purple loosestrife and implement controls.
- e) Notify Water Resources Board of complaints re: float planes.
- f) Swimming is allowed except from access area where it is not allowed.

2.1c) Wetland Natural Communities

Seven natural community types are represented: *beaver wetland, shallow emergent marsh, cattail marsh, spruce-fir/tamarack swamp, vernal pools, seeps, and red maple-black ash swamp.* (These do not include the hemlock swamps already mentioned in 1.1b). Wetland communities contribute to ecological integrity by protecting water quality and providing wildlife habitat. Management activities will incorporate appropriate buffers to minimize negative ecological impacts. This classification includes the 100 foot riparian buffer along the pond edge.

Implementation:

- a) There will be no timber harvest or new trail construction within 100 feet of the pond's edge.
- b) There will be no disturbance to cultural features in or around the pond or wetlands.
- c) Riparian areas owned by the state along the pond that are not currently forested will be left to reforest starting in 2004 including two illegal timber trespasses.
- d) Timber harvesting and wildlife management activities implemented near vernal pools and wetland areas will be conducted to protect and maintain the structure and integrity of the habitat.
- e) Coarse woody debris – maintain a minimum of two large (>12 inches in diameter) downed trees per acre.
- f) Forestland conversion to roads, grassy areas – none to be constructed/ developed between breeding, foraging, and over-wintering habitat. On Gale Meadows WMA, the hardwoods, mixed wood, and hemlock stands provide the higher quality foraging and over-wintering habitat.
- g) Recolonization corridors are to be established between amphibian breeding sites to assure connectivity among the various populations. These corridors will be located along riparian areas when possible. If not, corridors can be located within the hardwood and/or mixed woods where at least a 70-year rotation is in place. These terrestrial corridors can be “moving windows” that are replaced by other sites meeting the 70-year rotation requirement.

2.2) Critical Deer Wintering Area (*map reference 2.2*). The 110 acres of critical deer wintering represent an important habitat element on Gale Meadows WMA. These areas are located in mostly softwood (spruce/fir) and some of the mixed northern hardwood community types which are common in Vermont.

Implementation:

- a) Maintain and improve wintering areas through commercial and noncommercial harvesting.
- b) Skid roads and log landing areas for commercial timber harvesting may be constructed.
- c) Regulated hunting, fishing, and trapping are allowed except on the Ford Lot.

- d) In areas adjacent to winter cover, forest regeneration and high quality browse for deer should be created. One sale is planned (see Figure 14 and Implementation Schedule) for this area.
- e) Dispersed non-motorized recreational activities such as hunting, fishing, trapping, hiking, snowshoeing, and cross-country skiing are allowed within these areas.
- f) Motorized recreation, camping, and mountain bikes are not allowed.

2.5) **Conservation Easement Lands** (*map reference 2.5*).

- 2.5a) **Thompson Lot** (*map reference 2.5A*). In this 45-acre section of the property, forest cover is comprised of a mature hardwood stand on one half and a mature pine stand on the other. There is a ¾ mile hiking trail along the perimeter of the pond. According to deed, this section will remain in a “natural state forever”. There is a plaque dedicated to the Greens on the north shore of the pond.

Implementation:

- a) Existing stonewalls and other cultural features will not be disturbed.
- b) The Green’s dedication plaque on the north shore of the pond will be maintained.
- c) Dispersed non-motorized recreational activities such as hunting, fishing, trapping, hiking, snowshoeing, and cross-country skiing are allowed.
- d) Motorized recreation, camping, and mountain biking will not be allowed.
- e) The trail on the perimeter of the pond will be maintained for pedestrian traffic.
- f) No additional trails or recreational structures are planned for this area.
- g) Recreational uses will be monitored to determine any negative impacts.
- h) No timber harvesting, commercial or non-commercial will be allowed although vegetation at certain features may be managed to preserve the resources.

- 2.5b) **Ford Natural Area** (*map reference 2.5B*). This 32-acre section of the property was a gift to the state in 1969 by Carroll and Emily Ford. This area will be preserved to allow natural processes and ecological functions to continue. However, its small size and landscape fragmentation, due to development, degrades its ecological value considerably. There have been two timber trespasses (unauthorized tree cutting) on the property and several other encroachments such as trash dumping and fencing. The majority of the area is mapped deer wintering area.

Implementation: Non-“Pittman-Robertson” funds will be sought to implement the following tasks:

- a) Residential encroachments such as tree cutting and the extension of people’s residential uses onto the edge of the parcel will be monitored and rectified on an as-needed basis.
- b) Existing stonewalls and other cultural features will not be disturbed.
- c) Non-motorized recreational activities that are dispersed activities such as hiking, snowshoeing, and cross-country skiing are allowed.
- d) Motorized recreation, camping, mountain biking, hunting, trapping, fishing, and firearms are not allowed on this section of the WMA due to deed restrictions.

- e) No additional trails or recreational structures are planned for this area.
- f) Recreational uses will be monitored to determine any negative impacts.
- g) No timber harvesting activities will occur within this area.

3) **General Management (232 acres) (Map Reference 3.0)** – This 232-acre area is comprised of two large forested areas – one on the northwest and one on the southeast portion of the property. Both areas are gently rolling terrain with a variable forest cover including natural community and forest cover types common in Vermont such as White Pine, Northern hardwood, Red Spruce-Northern Hardwood, and Lowland Spruce-Fir. White pine trees dominate the composition in many areas. Common wildlife are white-tailed deer, snowshoe hare, red squirrels, barred owls, and songbirds. There is one historic record of two pairs of black-backed woodpeckers nesting in spruce stands here in the 1960s. There are traces of old roads but no official trails. Recreational use is generally light use for hunting. One illegal trail, used by mountain bikes, is located adjacent to the access area. The primary emphasis will be on the maintenance and creation of wildlife habitat, vigorous forest stands, and dispersed recreation. The area is subject to easements held by the Vermont Land Trust.

Implementation:

- a) Timber harvesting practices will be implemented to maintain existing community types, promote wildlife habitat by encouraging the development of mast-producing trees, coniferous regeneration, woody browse, snag trees and aspen stands and to develop vigorous high quality trees according to established guidelines (see Appendix F). Management decisions will be based on wildlife habitat objectives, health and vigor of stands, crown closure, evidence of heavy browsing, and basal area.
- b) All-aged vegetation management will be applied. Even-aged practices may be used to establish early successional habitat. Even-aged practices may also be necessary to grow advanced regeneration beyond heavy deer browse.
- c) Three timber sales will be implemented in the plan period. Descriptions are located in the implementation schedule.
- d) Two 2 ½ acre patch cuts will be incorporated into each timber sale to provide early successional habitat.
- e) Roads will be constructed when they are necessary to meet vegetation management objectives. They will be as narrow as possible, temporary in nature, and only in areas least sensitive to human disturbance. No additional access roads are planned.
- f) Stonewalls, cellar holes, and other cultural artifacts will be protected according to ANR guidelines for protection of historic and cultural sites.
- g) Non-motorized recreational activities such as trapping, hunting, fishing, hiking, snow shoeing, and cross-country skiing are allowed within these areas.
- h) Gale Meadows WMA is not a designated primitive camping area. Motorized recreation, camping, campfires, and mountain biking are not allowed.
- i) Two new public access areas with small two car pull-offs will be developed and are planned for construction in conjunction with timber harvest operations (See Figure 9 and Implementation Schedule).
- j) The current illegal trail south of the access area will be closed and barricaded to prevent negative impacts to wildlife.
- k) No new trails will be constructed but closed log roads will be available for pedestrian traffic.

- l) Control of honeysuckle will be investigated and implemented as needed.
- m) If fires or insect outbreaks occur in spruce-fir stands on the property, potential salvage harvests may be modified, as these events create ideal black-backed woodpecker habitat.
- n) Strategies for management of forest stands damaged by insects and/or disease will be ecologically sound and based on appropriate silvicultural practices.

4) **Intensive Use (4 acres)**

4.4) **Public Access Area (map reference 4.4).** This serves as the main access for boat launch and foot traffic on the property. It is three acres in size and includes the boat ramp, parking area, and dam/spillway. It features a commemorative plaque for the original landowners of the pond, an informational kiosk, sign, and a paved boat ramp. Gale Meadows Road is a F&W road, not plowed in the winter, connecting the access area to Haven Hill Road. The access area and right-of-way are maintained by the ANR's Facilities Engineering Division of the Department of Environmental Conservation. Many different types of public recreation are common here. The parking area is often crowded. Unleashed dogs are a problem. Vandalism and garbage have been problems during the summer months. The primary purpose for the access area boat launch is for use by anglers, hunters, and motorboats. In recent years, the general non-sporting community has used this area increasingly and is now the most common user.

Implementation:

- a) If conflicts arise between traditional and non-traditional recreation groups, enforcement may be necessary to ensure that the traditional users, specifically hunters, anglers, and motorboaters can pursue recreation without conflict.
- b) Monitoring for invasive exotic plants and environmental contaminants will be ongoing.
- c) This area will continue to serve as the main access point for the public.
- d) Camping and campfires are prohibited at the access area and throughout the WMA.
- e) Parking of any boat trailer or vehicle on the boat ramp is not permitted.
- f) Boat storage in the parking area or the shoreline is not allowed.
- g) Mountain bikes are permitted on the gravel access road.
- h) If the Town of Londonderry so designates, snowmobiles and ATVs can ride on the town road to the boat ramp.
- i) Motorized recreation is not permitted in the access area.
- j) Vegetative management will be directed toward aesthetic and safety considerations.
- k) Hazardous trees will be inventoried on a periodic basis and removed according to department procedures for detection, assessment, and correction of hazardous trees in recreational areas.
- l) The parking area may be used as a winter log landing.
- m) Enforcement of littering and vandalism will continue along with kiosk signage placed to educate public on the rules and regulations governing this property.
- n) Continue trash collection at the access. Citizens and DEC will continue to monitor water quality in the pond.
- o) Swimming is not allowed from the access area or dam and appropriate notice will be posted.

- p) Eliminate commercial activities at the boat launch to alleviate overcrowding. Vendors will be notified that commercial activities are not allowed on the WMA.
 - q) Request that the access road be posted for 15 mph to reduce noise and unsafe driving.
 - r) Users will be requested to keep dogs under control at all times and notice will be posted.
- 4.8) **Power line ROW (map reference 4.8).** This two-acre area is under a powerline that is managed by Central Vermont Public Service (CVPS). Efforts will be made to assist and cooperate with CVPS to better manage this area for wildlife and recreation. This area will remain in an early successional habitat type as long as CVPS maintains it that way. This area provides some early successional habitat but also fragments a portion of the WMA.

Implementation:

- a) Work with CVPS to maximize wildlife benefits and minimize the disturbance of cultural features within the ROW.
- b) Non-motorized pedestrian recreation is allowed.
- c) Motorized recreation, camping, and mountain bikes are not allowed.
- d) Vegetative management is performed by CVPS and is considered early successional habitat and included in the target goal for maintaining this type of habitat on the property.

C. Future Acquisition of Lands

Through its October 1999 *Vermont Agency of Natural Resources Lands Conservation Plan*, the agency outlined priorities for acquiring new lands as well as for acquiring additions to existing ANR lands. Four priorities for adding to existing lands are as follows:

1. Lands necessary for maintaining or enhancing the integrity of existing state holdings;
2. Inholdings and other parcels that serve to consolidate or connect existing state holdings and contain important public values;
3. Parcels that facilitate public access to agency lands; and
4. Parcels that serve an identified facility, infrastructure, or program need.

Conservation of the forested wildlife corridor along Mill Brook, through acquisition or easements, is important to maintaining habitat connectivity between Gale Meadows WMA and the Green Mountain National Forest.

All ANR land acquisitions must have a willing seller, as the agency does not have the authority to exercise eminent domain. Any future acquisition opportunities near Gale Meadows WMA will require consultation with both the appropriate towns and regional planning commissions.

D. Vegetation Management Objectives

The primary timber management goal for this parcel is wildlife habitat. Listed below are some secondary vegetative management objectives:

- Maintain tree health and vigor.
- Improve timber quality where possible.
- Retain beech and cherry component for mast production.
- Release desirable regeneration.
- Provide an abundant mixture of different tree species.
- Favor those species most suited to the existing soils.
- Strive to maintain a distribution of tree age classes.
- Maintain the aesthetic nature of this property within the pond viewshed.
- Produce a sustainable supply of wood products.

Recognized U.S. Forest Service silvicultural guides will be used when developing stand prescription for timber harvests. All-aged and even-aged silvicultural techniques will be utilized to achieve previously outlined goals and objectives.

Stand treatment decisions will be based on wildlife habitat requirements, health and vigor of stands, the rate of individual tree crown closure, evidence of heavy deer browsing, and stand basal area. New information, changes in state lands policy, and recommendations from other departments or agencies may change specific recommendations.

E. Water Resources

The management of Gale Meadows Wildlife Management Area by the Departments of Fish and Wildlife and Forests, Parks, and Recreation will, at minimum, maintain the quality of all the surface waters associated with the land. It is understood that agricultural and silvicultural activities which follow accepted Agricultural Practices and Acceptable Management Practices are presumed to conform with Vermont's Water Quality Standards.

Managers of ANR land holdings will cooperate with the ANR's Department of Environmental Conservation, Water Quality Division with their watershed planning initiatives for the West-Williams-Saxtons River Basin and others as they are undertaken.

The watershed basin planning effort includes the determination of the water management type of all waters located with the basin. Through this process, the water classification and water management type for all waters will take into consideration the existing water quality, the desired water quality, and whether or not the desired quality is attainable.

The goal for the water management type of waters below 2,500 feet that flow through ANR lands is of a high level (potentially B1). B1 waters are managed to maintain an almost natural condition showing minimal changes from reference conditions for aquatic macroinvertebrates and fish assemblages. Possible exceptions to B1 typing include the following:

- where water level fluctuates due to dam bypass areas; and
- situations where B1 water quality is otherwise unattainable.

F. Implementation Schedule

Year	Actions/Purpose	Comments	Responsible Parties	Outcomes
As Needed	Access Area and Dam Maintenance	Kiosk information and commemorative plaques maintained and updated	District Fisheries and Wildlife Biologist	Maintenance
As Needed	House and Barn Repairs			Maintenance
As Needed	Maintenance of North Trail		Forester I, State Lands	Trail Improvement
Annual	Mowing of Fields. Modify mowing at Tralee to incorporate 50' buffer	3 Acres	State Lands Forester, District Wildlife Biologist	Field Maintenance
As Needed	Road Repairs		State Lands Forester, District Wildlife Biologist	Maintenance
2005	Illegal Trail Closure		Forester I, State Lands	Erosion prevention, compliance with legal mandates
2005	Replanting	Tralee Pond Buffer	State Lands Forester, District Wildlife Biologist	Understory release (snowshoe hare habitat), crop/mast tree release
2005	Seek conservatorship of Tralee complex from conservation organizations		District Wildlife Biologist/District Forestry Manager	Preserve buildings through use
2006	Remove Tralee structures if conservatorship fails	In consultation with Historic Preservation Division	District Wildlife Biologist	Public safety
2006	Purple loosestrife control	Apply for controlled release of beetles to feed on purple loosestrife.	District Wildlife Biologist	Reduction of invasive exotic plant success.
2007	Apple Tree Release	Ten-year Intervals	Forester I, State Lands	Maintain historic orchards and wildlife habitat
2007	Timber Sale #1	Pine and Hardwood Sale	State Lands Forester, District Wildlife Biologist	Understory release (snowshoe hare habitat), crop/mast tree release
2007	Timber Sale Patches	Two Hardwood 2.5-acre Patches	State Lands Forester, District Wildlife Biologist	Early successional habitat, forest regeneration
2007	Two car pull-off #1 w/informational kiosk and signage	Winhall Hollow Road, NW side of property.	State Lands Forester, District Wildlife Biologist	Public Access
2012	Timber Sale #2	Pine and Hardwood Sale	State Lands Forester, District Wildlife Biologist	Understory release (snowshoe hare habitat), crop/mast tree release
2012	Timber Sale patches	Two Hardwood 2.5- acre Patches	State Lands Forester, District Wildlife Biologist	Early successional habitat, forest regeneration
2017	Timber Sale #3	Softwood Hardwood Sale (Commercial/Non-Commercial)	State Lands Forester, District Wildlife Biologist	Wildlife habitat improvement objectives, deer wintering area enhancement
2013	Two car pull-off #2 w/informational kiosk and signage	Spruce Low Road 3.1-acre lot	State Lands Forester, District Wildlife Biologist	Public access log landing

Draft Timber Sale Prescriptions*

<p>Timber Sale 1</p> <p>Sale # 1 will be up to 100 acres on the northwest portion of the property. Two 2½ acre patch cuts will be conducted to create early successional habitat for grouse, woodcock, deer and moose. The remainder of the sale area will be treated with group and single tree selection for mast production, hazard tree reduction along the roadway, snag and cavity tree and coarse woody debris recruitment, and understory release of desirable species such as red spruce and balsam fir for snowshoe hare cover and black cherry for future food production for black bears and songbirds.</p>	<p>Land Use Classification 3.0 comp.3, stands 1 & 4</p>	<p>2007</p>
<p>Timber Sale 2</p> <p>Sale # 2 will be up to 100 acres on the southeast portion of the property. Two 2½ acres patch cuts will be conducted as in Sale # 1. The remainder of the sale within compartment 2 will be conducted as in sale #1. A small portion of deer wintering area in Compartment 1 will be treated with hardwood cull removal to improve the success of hemlock, spruce, and pine crop trees and reproduction.</p>	<p>Land Use Classification 3.0/2.2 comp. 2 stands 1 & 2, comp. 1 stand 1</p>	<p>2012</p>
<p>Timber Sale 3</p> <p>Sale area 3 will be up to 30 acres and treat portions of the deer wintering area on the south side of the wetlands in Compartment 1. The prescription will include cull hardwood removal to improve growing conditions for softwood crop trees and reproduction.</p>	<p>Land Use Classification 2.2 comp. 1 stand 1</p>	<p>2017</p>

**Sale prescriptions are fine-tuned by the district stewardship team prior to harvest.*

[Figure 14. Vegetative Management Map.]

VI. Monitoring and Evaluation

During the life of the Long-Range Management Plan for Gale Meadows WMA, periodic monitoring will be conducted to insure that the resources are protected from fire, insect and disease, other natural disturbances, encroachments, or unforeseen problems that may occur within the wildlife management area. Management activities will be evaluated to determine how closely the results matched those projected within the plan. Minor adjustments in management may be made to reflect changed conditions or unanticipated results.

Long-range plans for the management of ANR lands provide guidance for long-term management and development of those lands. However, the future may not be fully determined at the time a plan is developed. A long-range plan may be amended when significant changes to a plan are proposed, including the following:

- Major change in use or species management direction;
- Major land acquisition to be added to an existing parcel;
- New recreation corridors not identified in a current plan;
- Major capital expenditures for new projects;
- Facility closures;
- Transfers in fee ownership;
- Designation of non-developed camping sites (via statute regarding camping on state lands);
- Leasing of new acreage (e.g., ski resort); and
- Renaming natural features (prior to recommendation to Department of Libraries) or lands.

When an amendment to a plan is proposed, the public is involved. The type and level of public involvement are determined at that time and depend on the extent of the amendment. If applicable, easement holders are notified to discuss the proposed amendment.

Occasionally public input may be sought by a district stewardship team regarding changes to a plan that are less significant than an amendment. These circumstances are left to the discretion of the district team involved.

A. Forest Health

The health of the forest stands within Gale Meadows WMA will be monitored yearly by department personnel through a system of aerial observation and ground checking. Significant changes in forest stand conditions will be recorded and investigated by the Forest Resource Protection specialist. The specialist will provide information regarding problems so that better informed management decisions can be made.

B. Vegetative Management

Timber harvests and wildlife management practices completed within Gale Meadows WMA will be periodically reviewed by the stewardship forester and the district stewardship team to determine how well management objectives are being met. If monitoring results indicate that there is a significant difference between the outcomes predicted by the plan and the actual conditions, changes to the plan may be recommended.

C. **Natural Communities**

Any exemplary, unique, and special natural communities and rare, threatened, and endangered (RT&E) species of plants and animals that are identified on this parcel will be periodically evaluated by the stewardship forester and the district stewardship team to determine conservation status (threats from recreational or other land uses) and successional trends.

D. **Recreational Activities**

Public recreation will be periodically monitored across the property by the district stewardship team to identify where recreational uses are in conflict or may be damaging natural resources. Changes in recreational uses may be implemented including new management strategies designed to minimize or eliminate conflicts. Game wardens will be asked to assist with maintaining compliance with state laws.

E. **Historic Resources**

The three historic districts on the property will be periodically evaluated by the district stewardship team to ensure that these sites remain protected and unharmed.