MANAGEMENT PLAN FOR FAIRYLAND FOREST, BONSHAW HILLS

Prepared by the Bonshaw Hills Public Lands Sub-Committee

For the Province of Prince Edward Island

November 2016

Old campground road in parcel 227199, near the northern boundary with the TCH (photo by Megan Harris)

Cover: Eastern hemlock on parcel 227199 (photo by Megan Harris)

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Executive Summary

This document describes a plan for management of a natural area in New Haven, PEI. It grew out of a mandated planning exercise for ecologically sensitive lands acquired during the Trans-Canada Highway realignment and involves three properties in New Haven that were most recently part of amusement parks – first Fairyland in the 1970s and then Encounter Creek (see Table 2.1).

The land included in this plan is forested with some stream and riparian components. The bulk of the infrastructure remaining from the commercial parks occurs north of the new highway alignment and this natural area does not extend to those lands. The forest includes hardwood stands at least 80 years old and a riparian margin of older eastern hemlock and red spruce. The existing old campground trails provide easy access to a beautiful example of mixed wood forest. There is potential here to provide recreational users of the popular nearby Bonshaw Hills Provincial Park with an alternative, less busy trail system that can accommodate families on wider than single-track trails.

This plan outlines management goals that work toward a balanced set of values for ecological conservation, outdoor recreation and education. With the broader management principles laid out by the Bonshaw Hills Public Lands Committee (BHPLC) in mind (see section 3), the following are broad management goals for this particular set of three land parcels:

Goal 1 [conservation] – to protect and enhance the upland and riparian zone forest communities as a first priority

Goal 2 [conservation] – to conserve long-lived shade tolerant and intolerant trees of the Acadian (or Mi'kmaq and Maliseet) forest type[1] and foster forest species diversification in areas affected by past tree cutting and amusement park infrastructure

Goal 3 [conservation] – to restore forest and stream habitats to a more natural state by removing any invasive alien species and remaining built structures

[1] so named because the range of this type of forest roughly matches the area occupied by Acadians in the 1600s but also is part of the original territory of these two First Nations, called Wapan'ecatie (land of the dawn)

Goal 4 [recreation] – to maintain the existing network of trails for walking, cycling and snowshoeing and establish a trail linkage to the adjacent area dedicated for parking, without undue impact on ecologically sensitive environments and with particular attention to preventing any associated soil erosion in this steep landscape

Goal 5 [recreation] – to encourage the enjoyment of natural Island forest ecosystems through low-impact activities such as bird-watching and nature photography

Goal 6 [education] – to offer opportunities for people of all ages to experience and learn from nature in a mature forest habitat with varied forest types and historical impacts

Goal 7 [education] – to provide educators and researchers with a venue for gathering conventional and traditional ecological local knowledge[2]

Sections 4 and 5 provide details on the actions recommended to meet these conservation, recreation and education objectives. Section 6 emphasizes the long-term management needs inherent in meeting those objectives along with the necessity of partnerships among government departments and non-government organizations. In concert with this management plan, separate and complementary restrictive covenant plans were developed to ensure that these properties have legislated protection under the Natural Areas Protection Act (NAPA). The following is a summary of management actions with estimated timeframes that are to be achieved through stakeholder partnerships.

Action	Details	Timeline
Protect all lands under the Natural Areas Protection Act legislation	Develop NAPA plans and designation documents through the NAPA Technical Advisory Committee	2016
Manage zone I area to maintain the existing high ecological integrity	Keep impact from recreation to a minimum; monitor trails for erosion and introduction of invasive species	2016 - ongoing
Diversify and restore habitats in zones II and III	Minimize disturbance to existing woods by applying non-intrusive forestry methods like small patch cutting and under-planting as in table 4.1	2017 - 2025

[2] Conventional in this instance refers to science-based information whereas traditional ecological local knowledge encompasses the knowledge of local ecology and natural history passed down orally by First Nations Mi'kmaq and others having a history with the land

Action	Details	Timeline
Maintain existing trail loops for multi-use active living	Maintain loops for walking, cycling and snowshoeing	2016 - ongoing
Create connector trail from existing trails to parking lot	Create a single track trail, taking care to minimize damage through sensitive ravine and wet woodland habitats	2017
Create and maintain trail orientation and nature interpretive signage	Develop signage that is consistent with the nearby Bonshaw Hills Provincial Park in difficulty coding	2017
Establish a multi-stakeholder group to assist in management	Establish a group to oversee use and recommend management needs over the long-term for this natural area	2017 - ongoing

Contents

1. Context for Management Plan

This planning document differs from the norm for land management on Prince Edward Island in that it originated, not wholly to direct resource use of a public forest or conservation of a natural area, but out of the need to meet a condition for approval of an infrastructure project. In 2012, approval was granted to the Department of Transportation and Infrastructure Renewal (now Transportation, Infrastructure and Energy) by the Department of Environment, Labour and Justice (now Communities, Land and Environment) to proceed with the proposed Trans-Canada Highway realignment project between Bonshaw and New Haven, PEI. One of the stipulations of project approval was the development of a management plan for environmentally sensitive land in the area. This document is one in a series of four; it outlines plans for three properties that once formed Fairyland, an amusement park in New Haven.

Because of the unusual context, this series of plans provides broader direction for land management than might be found elsewhere – one that moves beyond traditional forestry management or restoration strategies. They are directed by the recommendations of the Bonshaw Hills Public Lands Committee (BHPLC)[3] to manage the lands not only for conservation, but also for recreation and education. As such, some or all include plans for natural areas protection, forest conservation and restoration, trails development for hiking, cycling, snowshoeing and skiing, and consideration of nature education development. Additional plans for protection under the Natural Areas Protection Act are being developed as separate documents (as per legislative requirements) in tandem with these management plans and will complement and strengthen the conservation goals outlined herein.

[3] Bonshaw Hills Public Lands Committee (BHPLC), 2013. Recommendations for the Conservation of Public Lands, Bonshaw – New Haven. Prepared for the PEI Department of Transportation and Infrastructure Renewal, October 2013. http://www.gov.pe.ca/tir/bonshawhills

2. Property Descriptions

This document describes a plan for the management of what was once Fairyland (then Encounter Creek) in New Haven. It includes portions of three wooded properties to the south of the realigned highway and an adjacent portion of un-worked pastureland where a parking lot is situated for public access (Figure 2.1, Table 2.1). The majority of the built infrastructure associated with the former amusement parks still exists to the north of the highway, and that area is not included in this plan.

Table 2.1 Properties included in this management plan

Property #	Size (acres)	Size (ha)	General Description
1059039	0.5	0.2	Connecting corridor to old TCH (Churchill Rd), wooded
600767	18.0	7.3	Mature mixed woods
227199	25.7	10.4	Mature mixed woods with old growth in stream ravine
1054691	-	-	Parking lot for public access to woodland parcels

Roughly 44 acres (18 ha) in total, this is a surprisingly intact and mature mixed-wood forest considering that for many years the land supported a popular campground and amusement park. The southeastern edge is particularly beautiful, with old hemlock and red spruce creating a lofty canopy over a small un-named brook. The terrain throughout is steep as is typical of the West River watershed.

Provincial aerial photographs taken from 1935 to the present suggest that the land was largely forested throughout most of the last century (Figure 2.2). Excerpts from former Premier Walter Shaw's history of the area describe the heavily forested hilly country between the Dunedin Bridge and Bonshaw as rugged and remote[4]. The Scottish clans that settled the area brought with them many superstitions that found fertile ground in these deep woodlands; tales of ghosts, buried treasure at nearby Blue's Cove and fairies abound.

[4] Shaw, Walter. 1975. *Tell Me The Tales*. Square Deal Publications, Charlottetown, PE.

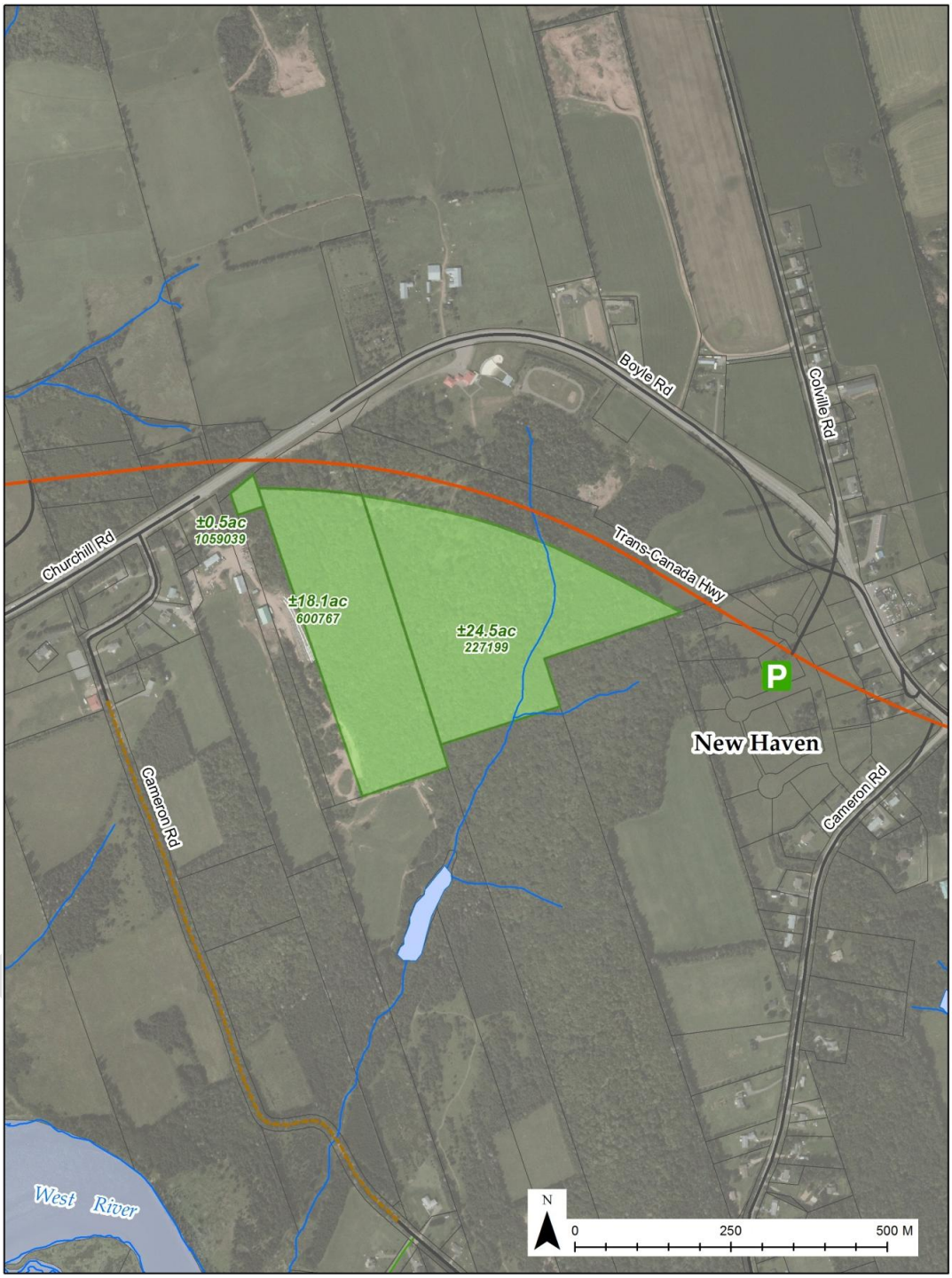

Figure 2.1 Properties shaded in green are public lands included in this management plan, with parcel numbers and acreages.

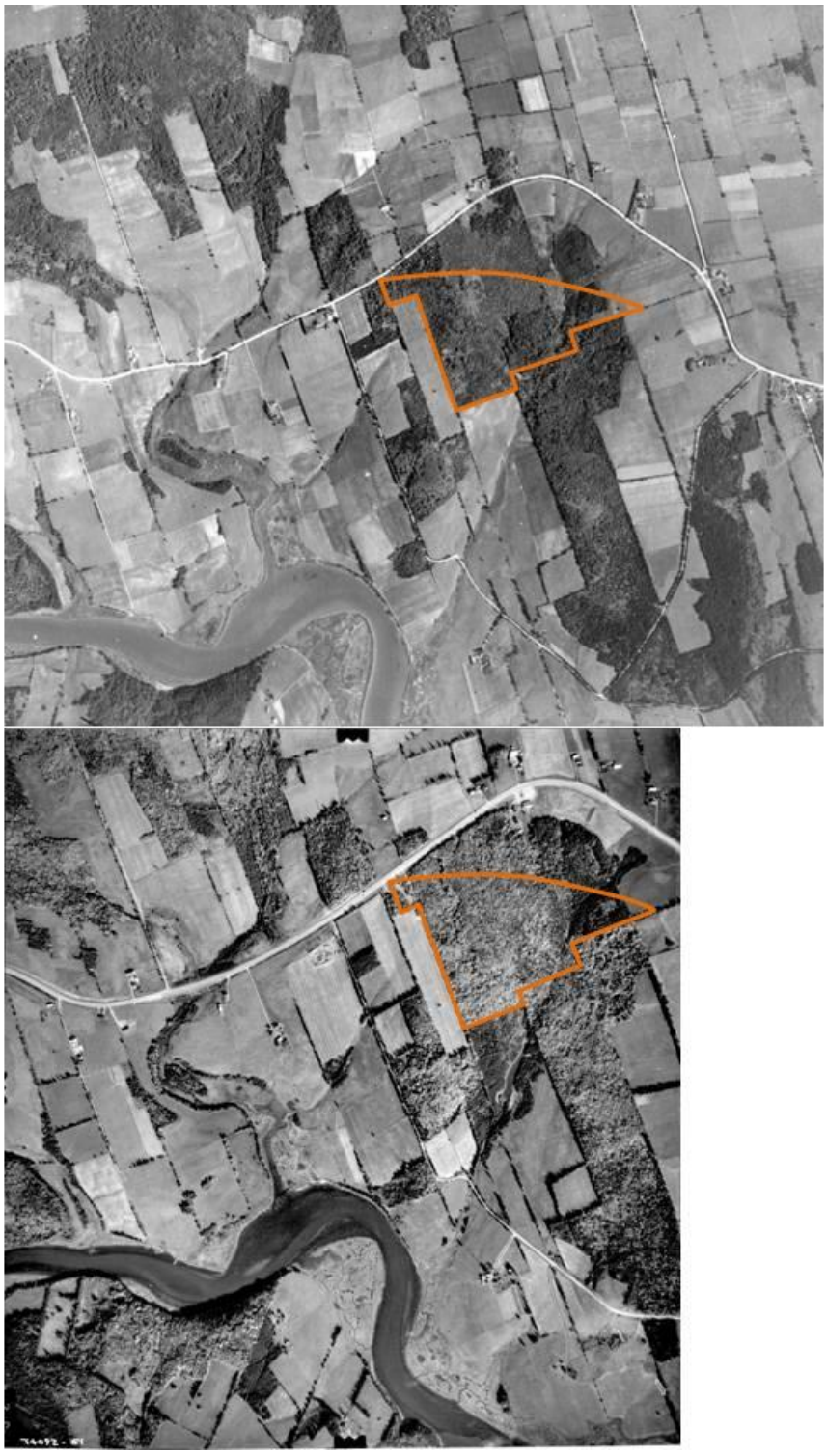

Figure 2.2 Aerial photographs of the area between Churchill and New Haven in 1935 (top) and 1974 (bottom). The land parcels that now make up* Fairyland Forest Natural Area *are roughly outlined in orange. Note the presence of Fairyland park infrastructure in the 1974 image.

Perhaps it is fitting then that the old woodlands of the McFadyen, McNevin and Cameron clans became the home of Fairyland in the 1970s. A Dutch couple [?] created this amusement park complete with the cottage of Snow White and the Seven Dwarves, Red Riding Hood's grandmother's house, Cinderella's pumpkin carriage and many fairytale characters placed throughout the woods near the northern property boundary. The amusement park elements were connected with a network of trails that extended deeper into the woodland to camping areas.

Although these built structures have all since been removed from the property south of the new highway realignment, there remains evidence of this recent human history in the presence of the old trails and the mix of wildflowers on the forest floor. The native pink lady's slipper (*Cypripedium acaule*) and unique mutations of painted trillium (*Trillium undulatum*) in the southern intact woodland merge with an understory containing garden ornamentals like foxglove (*Digitalis* spp.), daylilies (*Hemerocallis fulva*) and rhododendrons (*Rhododendron* spp.). One exotic that lines the paths along the northern boundary, broad-leaved helleborine (*Epipactis helleborine*) is highly toxic if ingested and should be removed from the land.

Despite these human remnants, the majority of the woodland is a diverse, healthy mix of upland hardwoods and lowland (riparian) old softwoods (Figure 2.3). As the land slopes down from the old Fairyland campground south to the stream, the mix of sugar, red, mountain and striped maples, yellow and white birch and smaller balsam fir and American beech grades into a stand of old eastern hemlock. Young hemlock seedlings are well-represented in the understory of this stand, indicating a healthy soil and perhaps optimal amount of light on the forest floor adjacent to the trails. Eastern hemlock has a conservation status rank (S-rank) of S3S4, indicating a vulnerable to secure population in the Province[5]. Other uncommon tree species present at the site include a small number of American elm (S3 – vulnerable) and Allegheny or smooth serviceberry (S3). To the east of the small brook lies an area of forest that is wetter and

[5] Conservation status ranks are provided for 9,400 plants and animals in the Atlantic Provinces by the Atlantic Canada Conservation Data Centre (ACCDC). ACCDC develops ranks with input from experts for each province based on known distribution, population size, abundance trends and threats. Further information and rankings are available at http://accdc.com/

was selectively cut many years ago. It contains large, old red spruce on the steepest slopes and younger large-toothed aspen elsewhere.

Dense understory growth of ground hemlock, ferns and blue-bead lily dominates throughout, providing excellent conditions for ground-nesting birds. Bird surveys in the summer of 2014 noted a number of forest songbirds, including the eastern wood pewee, hermit and Swainson's thrushes, ovenbird and mourning, magnolia, blackburnian, black-and-white, black-throated green and yellow-rumped warblers. Appendix A is a list of all plants and birds noted during 2014 biological inventory visits, reprinted from the larger inventory document of all lands acquired during the highway realignment[6].

The small brook that starts as a spring immediately above the new highway realignment travels close to the eastern boundary of the property through a deeply incised landscape. The steep ravine seems disproportionate to the size of the brook but may indicate there was a greater volume of groundwater there at one time. Near the south-eastern boundary there is evidence that the brook was once dammed to create a small pond, possibly for trout fishing. Electrofishing surveys before the highway construction found small brook trout here; a diverse aquatic invertebrate community is also quite possible (but not known) given the undeveloped riparian margins and long history of minimal disturbance.

One of several cottages in the woods built as part of Fairyland in the 1970s and since dismantled

[66] Island Nature Trust, 2014. Flora and Fauna of the Bonshaw Hills: An Inventory of Flora and Fauna in Thirteen Sites in the Trans-Canada Highway Realignment Area New Haven to Bonshaw, PEI. A report prepared for the Bonshaw Hills Public Lands Sub-committee, October 2014 draft report.

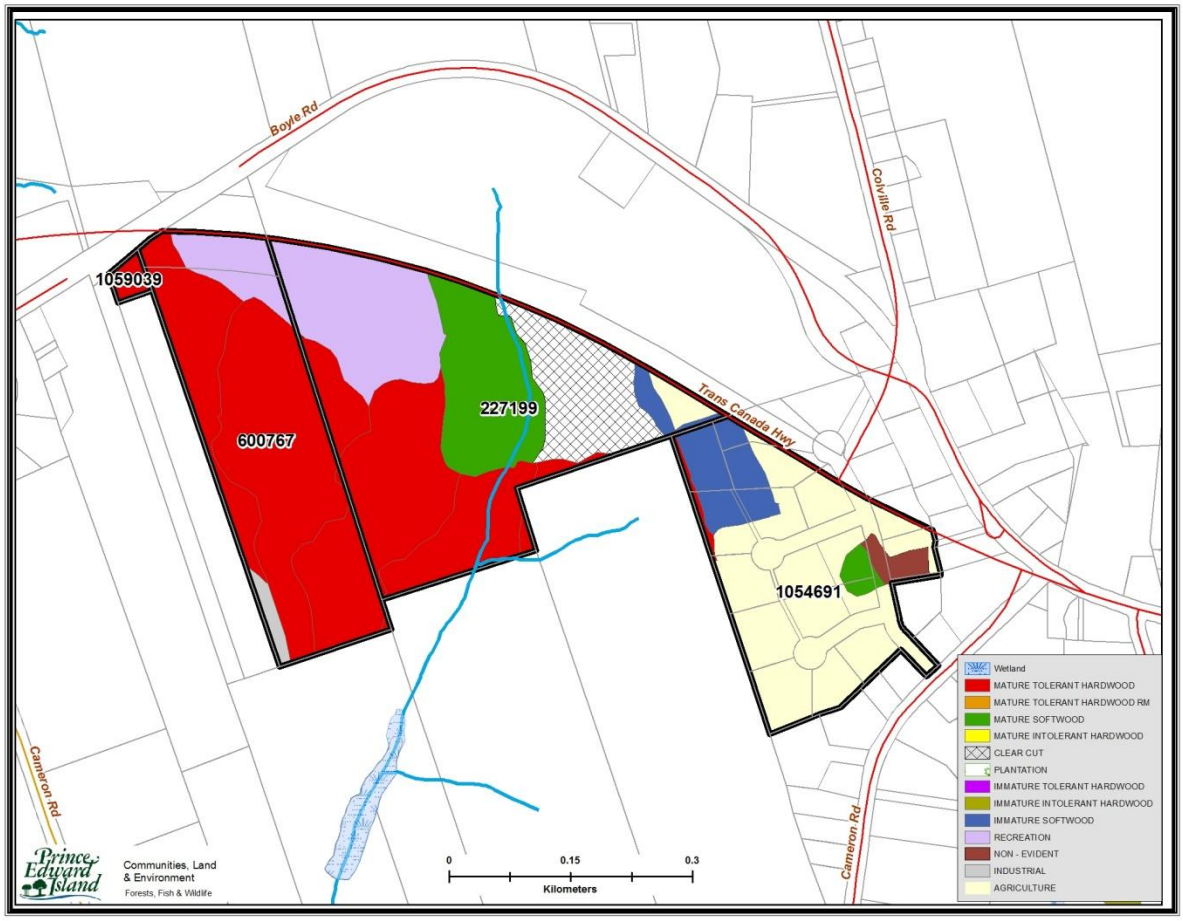

Figure 2.3 Forest cover in 2010 according to aerial land use census data from the Province.

3. Principles and Goals for Management

The Fairyland Forest has existing trails and is well-suited to balanced management for conservation, recreation and education use platforms. The Bonshaw Hills Public Lands Committee established a basic set of principles for land management that would direct decision-making at the smaller scale such as is covered by this plan for three of the land parcels. The following land management principles were derived through Committee consensus (taken verbatim from recommendations document)[7]:

1) Land management should consider relevant broader, existing strategies and policies such as the Provincial Climate Change Strategy and the West River Watershed Management Plan.
2) Conservation of existing areas with high geological, ecological or heritage values is of primary importance.
3) Strategic acquisition (through purchase or trade) or restoration of other areas is important where there is a positive impact on habitat connectivity or other broad management goals such as erosion control, active living or protection of view-scapes.
4) Preservation of lands should be considered for the most special / most sensitive areas.
5) Allowable resource uses should be based first on minimizing ecological risks and second on promoting active, outdoor, sustainable living.
6) Given the topography of the Bonshaw Hills region and the propensity of Island soils for erosion, long-term management plans should reflect a commitment to minimizing our chronic land use problems associated with soil erosion and excessive nutrient enrichment of groundwater.
7) Active management (*e.g.*, tree cutting, pruning, planting) may be allowed to enhance natural features or public access. Any funds generated (from tree cutting for example) will be reinvested in the properties.
8) Education and nature interpretation values should be built into the initial framework, to promote wise use of natural resources.
9) Land management should consider broader strategies for provincial parklands and other public lands in the vicinity, to maximize the public benefit and natural capital values.
10) Public access will be allowed unless there is a conservation or safety reason not to.
11) Within the context of principle #10:
    a. Management should accommodate multiple uses such as hiking, cycling, skiing, snowshoeing, low-impact camping, education, training and

[7] Bonshaw Hills Public Lands Committee (BHPLC), 2013. Recommendations for the Conservation of Public Lands, Bonshaw – New Haven. Prepared for the PEI Department of Transportation and Infrastructure Renewal, October 2013. http://www.gov.pe.ca/tir/bonshawhills

research. No motorized vehicle access will be allowed (with the exception of wheelchairs), unless it is for management purposes.

b. Traditional consumptive uses (hunting, angling, trapping, berry-picking) will be allowed unless there is a legal restriction.

Working within these principles, the following are broad management goals for this particular set of three land parcels:

Goal 1 [conservation] – to protect and enhance the upland and riparian zone forest communities as a first priority

Goal 2 [conservation] – to conserve long-lived shade tolerant and intolerant trees of the Acadian (or Mi'kmaq and Maliseet) forest type[8] and foster forest species diversification in areas affected by past tree cutting and amusement park infrastructure

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Goal 7 [education] – to provide educators and researchers with a venue for gathering conventional and traditional ecological local knowledge[9]

[8] so named because the range of this type of forest roughly matches the area occupied by Acadians in the 1600s but also is part of the original territory of these two First Nations

[9] Conventional in this instance refers to science-based information whereas traditional ecological local knowledge encompasses the knowledge of local ecology and natural history passed down orally by First Nations Mi'kmaq and others having a history with the land

4. Protection of Conservation Values

This section addresses the first three land management goals. It relies heavily on the bio-inventories completed during the summer of 2014 (Appendix I) as well as 2010 land use census data on general forest cover and on 2012 – 2015 ground-truthing of terrain and ecological structure.

Most of the land in these parcels is steep, with thin ribbons of flat plateau to the northwest (by the highway) and lowland by the stream to the south. The retention of a more-or-less intact forest cover has protected this ecologically sensitive land from soil erosion; however, the existing trails which are remnants of old woods roads still present an erosion risk if not properly managed. The areas to the north and east that were selectively or clear-cut (likely close to 100 years ago) would benefit from under-planting to diversify the forest species mix, but the management needs in general are relatively small. Figure 4.1 divides the forest lands into zones that roughly follow forest cover types; Table 4.1 describes those zones in terms of their management needs.

Table 4.1 Land management for conservation values according to the zones shown in Figure 4.1

Zone	Basic Descriptor	Management Actions
I	Core, mature forest	Minimize disturbance as much as possible. Where trails exist, maintain to prevent erosion. Monitor at least annually for invasive species and remove systematically wherever they're found
II	Mature balsam fir & red spruce, steeply sloping	Minimize disturbance in steep riparian ravine. Further up-slope, create small (20 m square) patch cuts in balsam fir thickets and replant with a diverse mix of native Acadian forest species
III	Disturbed upland & wet (from spring seeps) partly cut forest	Under-plant with missing shade-tolerant native forest tree species that are appropriate for the two soil moisture profiles present.
IV	Property boundary intrusion of neighbouring shale pit	Reclaim this small area of disturbed soil by replanting with pioneer native conifers

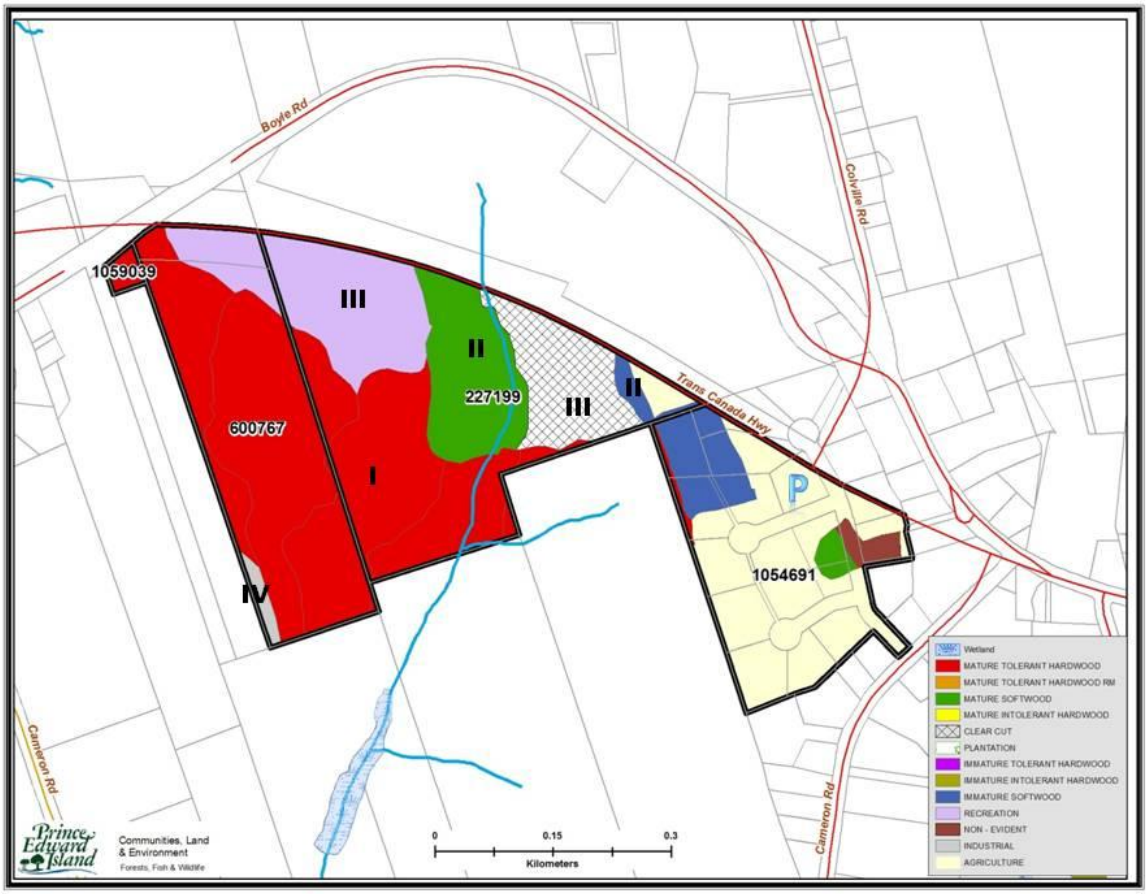

Figure 4.1 Zones for land management of properties included in the Fairyland Forest. Table 4.1 provides broad descriptions for each zone I – IV

The majority of the existing woodland trails are in the zone I management area. They begin on the flat northwestern plateau above the realigned highway and wind down to the stream in three main loops through some of the steepest parts of the property. To maintain the integrity of the upland mature hardwoods and lowland hemlock forests, it is important that new trail development is limited in this area. The understory is dense in places and provides a good mix of cover and forage habitats for wildlife. There are also sections with mature, collapsing balsam fir that provide excellent standing deadwood wildlife snags. Any further fragmentation of this habitat by trails and human traffic is undesirable.

A code of care for recreational users should be posted at trail heads that advises of the risks of invasive seeds carried in on shoes or equipment and promotes responsible trail use. Wandering off-trail, taking short-cuts, widening the trail by avoiding sections or otherwise damaging the understory growth along trails increases the overall impact of the trail network on the surrounding natural environment. It is also important to ensure that off-road vehicles do not gain access and use this area. Resources should be made available for monitoring of invasive species and trail deterioration or erosion. Given the maturity and healthy state of the eastern hemlock, it would be wise to establish a monitoring routine for invasive insects such as the hemlock woolly adelgid, hemlock looper and others. While these non-native pests are not yet present on the Island, their ranges are expected to expand northward with climate change and their impacts could be devastating should they become established.

The forest cover in zones II and III is younger on average than in zone I, but the canopy is still quite full. Where there are balsam fir thickets, it would be of benefit to make small patch cuts (20 m square or less) and replant with a more diverse selection of native tree species. Openings that are half to double the height of surrounding trees should maintain sufficient shade to discourage pioneer species while providing wind and temperature shelter for other native tree seedlings[10]. Any hardwoods planted must be wrapped to protect them from herbivores. The fir coveys are excellent predator cover for snowshoe hare and the population on these properties is likely high.

[10] Simpson J, 2008. *Restoring the Acadian Forest: A Guide to Forest Stewardship for Woodlot Owners in the Maritimes*. Four East Publications, Tantallon, NS.

The stand of large-toothed aspen and red maple in the far-east section of the property is wet due to groundwater seeps along the extent of this slope. Diversification with other wet-tolerant species such as white ash, black ash, eastern larch, eastern white cedar, and winterberry would add value for wildlife and accelerate the succession back to diverse mixed-wood forest. In the dryer, upland hardwoods section to the northwest (impacted by previous campground development), understory planting with small trees and shrubs may provide the best buffer from highway noise. Potential species include chokeberry, staghorn sumac, ironwood, beaked hazelnut, hobblebush, witch hazel, serviceberry and elderberries. Some red spruce or white pine planted along the periphery should also create an effective sound and sight barrier over time. Very dense planting will impact negatively on the diversity of wildflowers in the understory and should be avoided, particularly where there are uncommon mutations of painted trillium.

A small pocket of highly disturbed land exists, intruding across the property boundary from the adjacent shale pit in the southwest corner. This should be reclaimed and replanted with tree species tolerant of full edge light, possibly white pine, sugar maple or yellow birch.

In all areas, care should be taken to limit disturbance of the understory. Standing and fallen dead-wood are important wildlife habitat. Their clean-up should be limited to areas adjacent to trails where they present a safety hazard or they block the trail. If the density of partially downed deadwood becomes too great and is deemed a high fire risk, some may be brought down to the forest floor but not removed.

5. Accommodating Resource Use

This section addresses the last four land management goals, pertaining to recreation and education. Although this land parcel is small compared to the nearby expanded Bonshaw Hills Provincial Park land, it provides advantages for some recreational trail users because of its size. The existing trail loops are short, making it easier for those who are less mobile to access and view examples of old growth forest (Figure 5.1) compared to the park where the oldest forest is kilometers in by single-track trail. All of these trails are also old woods roads and therefore wider than single track, allowing groups of walkers or families with small children to walk two or more abreast.

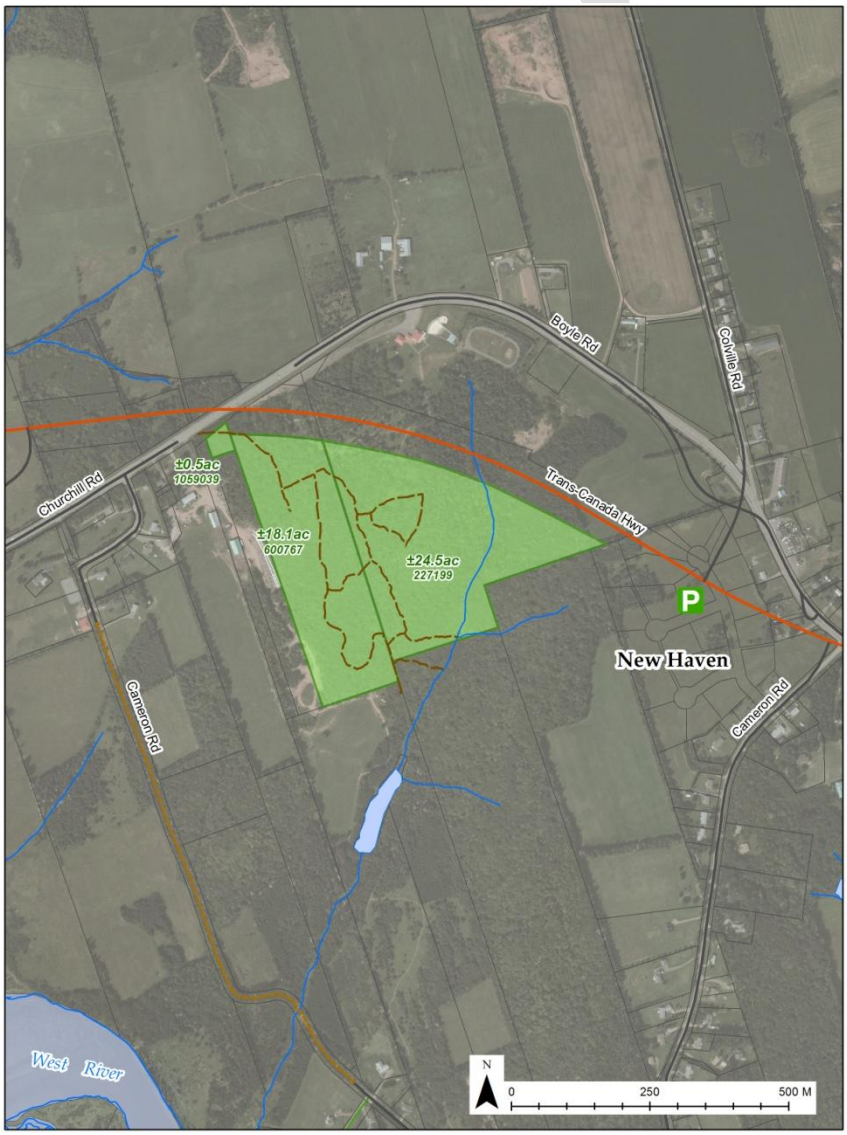

Figure 5.1 Location of existing trails in the Fairyland Forest (shown as brown dashed lines)

The main obstacle to trail use currently is the absence of a connector trail from the parking lot to the existing network. The stream and ravine lie between the parking lot and the trail network and there are a number of groundwater seeps along the intervening slope; hence a single-track connecting trail must be carefully planned and constructed to minimize environmental damage in this sensitive area. It may be necessary to construct some boardwalk where wet sections cannot be avoided. Other options for drainage of water away from the trail may be incorporated, with the use of natural materials like stone or downed woody debris.

The overall concept for recreational use of these lands is low-impact and low-maintenance with built environments being kept to a minimum. It would be useful but not essential to have a composting toilet and garbage bins. These would require a commitment for maintenance from the department responsible for management or from a partner group such as the Municipality of New Haven – Riverdale. Other than structures like these required for safety and environmental protection, infrastructure should be limited to signage for orientation and interpretation.

The short loop design of existing trails lends itself well to nature immersion education of school groups. There are a number of families of schools within easy bussing distance from this natural area, including those in Charlottetown, Kensington and Summerside. Several primary schools now have Green or Outdoor Clubs that meet after school and could access this land for forest ecosystem education. The expanding promotion and recognition of the values of nature education for children and youth is just beginning to take root in Island school curricula after an absence of many years. Having venues such as this that allow easy nature immersion is an important component to growing that interest.

6. Partnerships Required for Long-Term Management

The lands covered by this management plan are not intended to form part of the larger neighbouring expanded provincial park, but they nonetheless will require some lesser level of dedicated resources to manage effectively. Since this land acquisition originated with the TCH highway realignment, the managing department is Transportation, Infrastructure & Energy. Nevertheless, the designation of the land under the *Natural Areas Protection Act* along with its high ecological sensitivity suggest a benefit to having management input from other government departments (Communities, Land & Environment) and non-government organizations (Island Nature Trust, Central Queens Wildlife Federation, etc.). The presence of trails would also suggest some benefit to walking and cycling groups such as Island Trails and Cycling PEI and its proximity to New Haven may spark the interest of that municipal council. To achieve the goals outlined in this management plan, stakeholders must work together toward a shared vision. The development of a multi-stakeholder group to oversee use and management of this forest natural area would be of great benefit over the long-term and should be a priority for TIE.

7. Summary of Land Management Actions

Action	Details	Timeline
Protect all lands under the Natural Areas Protection Act legislation	Develop NAPA plans and designation documents through the NAPA Technical Advisory Committee	2016
Manage zone I area to maintain the existing high ecological integrity	Keep impact from recreation to a minimum; monitor trails for erosion and introduction of invasive species	2016 - ongoing
Diversify and restore habitats in zones II and III	Minimize disturbance to existing woods by applying non-intrusive forestry methods like small patch cutting and under-planting as in table 4.1	2017 - 2025
Maintain existing trail loops for multi-use active living	Maintain loops for walking, cycling and snowshoeing	2016 - ongoing
Create connector trail from existing trails to parking lot	Create a single track trail, taking care to minimize damage through sensitive ravine and wet woodland habitats	2017
Create and maintain trail orientation and nature interpretive signage	Develop signage that is consistent with the nearby Bonshaw Hills Provincial Park in difficulty coding	2017
Establish a multi-stakeholder group to assist in management	Establish a group to oversee use and recommend management needs over the long-term for this natural area	2017 - ongoing

Appendix I: Biological Inventory for Fairyland Natural Area

This is an excerpt from the full bioinventory completed on all lands associated with the work of the Bonshaw Hills Public Lands Committee[11].

The area is mainly Balsam Fir and Eastern Hemlock dominated woodland with weedy species growing near intersecting trails throughout the lot. This area exhibited unique finds such as several mutated Painted Trilliums and the highly toxic Broad-leaved Helleborine. The Broad-leaved Helleborine is located on the edges of a path. The open areas of this site contain several ornamental species among former park structures that were torn down in August 2014. The area was surveyed on June 3 and July 28 and 30, with additional samples collected on July 30. A total of 122 vascular plant species was recorded.

Frequency Notes: C=Common, O=Occasional, I=Infrequent

S-rank: The status was recorded for rarity of occurrence in Prince Edward Island for those plants assigned an S-rank from 1 to 3 by the Atlantic Canada Conservation Data Centre (ACCDC). The definitions assigned to S-ranks are: S1 = critically imperiled; S2 = imperiled; S3 = vulnerable; S4 = apparently secure; S5 = secure

TABLE I1: VASCULAR PLANTS IN WOODLAND AREAS

Name	Common Name	S-rank	Notes
Abies balsamea	Balsam Fir	S5	C
Acer pensylvanicum	Striped Maple	S5	C
Acer rubrum	Red Maple	S5	O
Acer saccharum	Sugar Maple	S5	C
Acer spicatum	Mountain Maple	S5	I
Agrostis hyemalis	Ticklegrass (Winter Bentgrass)	?	O, wetland
Amelanchier laevis	Allegheny Serviceberry (Smooth Serviceberry)	**S3**	I, woodland edge
Aralia nudicaulis	Wild Sarsaparilla	S5	C
Betula allegheniensis	Yellow Birch	S5	C
Betula papyrifera	White Birch	S5	C
Calamagrostis canadensis	Bluejoint Reedgrass	S5	C, wetland
Callitriche palustris	Vernal Water-starwort	S4S5	O, wetland
Carex brunnescens	Brownish Sedge	S5	C
Carex crawfordi	Crawford's Sedge	S4	C, wetland

[11] Island Nature Trust, 2014. Flora and Fauna of the Bonshaw Hills: An Inventory of Flora and Fauna in Thirteen Sites in the Trans-Canada Highway Realignment Area New Haven to Bonshaw, PEI. A report prepared for the Bonshaw Hills Public Lands Sub-committee, October 2014 draft report.

Name	Common Name	S-rank	Notes
Carex gracillima	Graceful Sedge	S4	O
Carex pseudocyperus	Cyperus-like Sedge	S5	O, wetland
Carex scabrata	Rough Sedge	S4	C, wetland
Carex trisperma	Three-seeded Sedge	S5	O
Chamerion angustifolium	Fireweed	S5	C
Clintonia borealis	Blue-bead Lily (Clinton Lily)	S5	C
Cornus canadensis	Dwarf Dogwood (Bunchberry)	S5	I
Cypripedium acaule	Pink Lady's-slipper	S5	O
Dennstaedtia punctilobula	Eastern Hay-scented Fern	S5	C
Doellingeria umbellata	Flat-top White Aster	S5	O
Epilobium ciliatum ssp.	Hairy Willowherb	S5	O, wetland
Equisetum arvense	Field Horsetail	S5	O
Eurybia radula	Rough Aster (Low Rough Aster)	**S3**	O, wetland
Fagus grandifolia	American Beech	S5	O
Galium palustra	Marsh Bedstraw	S5	C, wetland
Juncus effusus	Soft Rush	S5	O, wetland
Kalmia angustifolia	Sheep Laurel	S5	O
Lonicera canadensis	Fly Honeysuckle	S5	O
Lycopodium annotinum	Stiff Clubmoss	S5	O
Lycopodium obscurum	Tree Clubmoss	**S1S2**	O
Maianthemum canadense	Wild Lily-of-the-valley (Mayflower)	S5	C
Maianthemum racemosum	Solomon's-plume	S5	C
Medeola virginiana	Indian Cucumber Root	S5	O
Mimulus ringens var. ringens	Square-stemmed Monkey Flower	**S2**	I, wetland
Monotropa uniflora	Indian-pipe	S5	O
Oclemena acuminatus (syn. Aster acuminatus)	Whorled Wood Aster	S5	C
Omalotheca sylvatica	Woodland Cudweed	S4	I, near highway
Onoclea sensibilis	Sensitive Fern	S5	C, wetland
Orthilia secunda (var. Pyrola s.)	One-side Wintergreen	S5	O
Osmunda cinnamomea	Cinnamon Fern	S5	C
Osmunda claytoniana	Interrupted Fern	S5	I
Oxalis acetosella	Common Woodsorrel	S4	C
Phegopteris connectilis	Northern Beech Fern	S5	O
Picea glauca	White Spruce	S5	O
Picea rubens	Red Spruce	S5	O
Populous grandidentata	Large-toothed Aspen	S5	O
Populus tremuloides	Trembling Aspen	S5	C
Prenanthes trifoliolata	Threeleaf Rattlesnake-root (Lion's Paw)	S5	I
Prunus pensylvanica	Pin Cherry	S5	C
Prunus virginiana	Choke Cherry	S5	C
Pteridium aquilinum	Bracken Fern	S5	C
Pyrola americana	American Wintergreen	S4	C

Name	Common Name	S-rank	Notes
(rotundifolia)			
Pyrola elliptica	Shinleaf	S5	O
Rosa virginiana	Virginia Rose	S5	C
Rubus allegheniensis	Allegheny Blackberry (Common Blackberry)	S5	C
Rubus idaeus	Common Red Raspberry	S5	C
Rumex orbiculatus	Greater Water Dock	S5	O, wetland
Salix discolor	Pussy Willow	S5	O
Salix pedicellaris	Bog Willow	SNA	O, wetland
Sambucus racemosa	Red Elderberry	S5	C
Scirpus atrovirens	Woolgrass Bulrush	SNA	O, wetland
Solidago nemoralis	Field Goldenrod	S4	I
Sorbus americana	American Mountain-ash	S5	O
Sorbus decora	Northern (Showy) Mountain-ash	SNA	C
Streptopus lanceolatus	Rosy Twisted-stalk	S5	I
Symphotrichum lateriflorum	Starved Aster (Calico Aster)	S5	O
Taxus canadensis	Canada Yew (Ground Hemlock)	S5	C
Thelypteris noveboracensis	New York Fern	S5	O
Trientalis borealis	Northern Starflower	S5	C
Trillium undulatum	Painted Trillium	S5	C
Tsuga canadensis	Eastern Hemlock	**S3S4**	C, large trees
Ulmus americana	American Elm	**S3**	I
Viburnum nudum	Wild Raisin	S5	O
Viola macloskeyi	Small White Violet	S5	O
Atriplex patula	Halberd-leaf Orache	Exotic	I, wetland
Galeopsis tetrahit	Brittle-stem Hempnettle	Exotic	O
Malus pumila	Apple	Exotic	I
Phalaris arundinacea	Reed Canarygrass	Exotic	O, wetland
Ranunculus repens	Creeping Buttercup	Exotic	C
Solanum dulcamara	Bittersweet Nightshade	Exotic	C, wetland
Veronica officinialis	Gypsy-weed (Common Speedwell)	Exotic	C

TABLE I2: VASCULAR PLANTS IN OPEN AREA AROUND OLD CAMPGROUND

Name	Common Name	S-rank	Notes
Achillea millefolium	Common Yarrow	S5	C
Agrostis perennans	Perennial Bentgrass	S3	C
Anaphalis margaritacea	Pearly Everlasting	S5	O
Capnoides sempervirens	Pale/Pink Corydalis (Rock Harlequin)	**S2**	O, ornamental
Danthonia spicata	Poverty Oat Grass	S5	O
Erechtites hieraciifolia	Eastern Burnweed	S4	I, edge of Hwy R.O.W

Name	Common Name	S-rank	Notes
Euthamia graminifolia var. graminifolia	Flat-top Fragrant Goldenrod (Narrow Leaf Goldenrod)	S5	C
Fragaria virginiana	Virginia Strawberry	S5	C
Hypericum boreale	Northern St. John's Wort	S4S5	C
Juncus tenuis	Path Rush	S5	O
Oenothera biennis	Common Evening-primrose	S5	I
Oenothera perennis	Small Sundrops	S4	I
Omalotheca sylvaticum	Woodland Cudweed	S4	I
Oxalis stricta	Common Yellow Woodsorrel	S5	C
Poa palustris	Fowl Bluegrass	S5	O
Potentilla norvegica	Norwegian Cinquefoil	S5	O
Prunella vulgaris	Self-heal	S5	O
Solidago canadense	Smooth Goldenrod (Canada Goldenrod)	S5	C
Solidago rugosa	Roughleaf Goldenrod	S5	O
Symphyotrichum cordifolium	Heartleaf Aster	S4	O
Symphyotrichum novi-belgii	New York Aster	S5	O
Cirsium arvense	Canada Thistle	Exotic	I, **invasive**
Dianthus sp.	Dianthus	Exotic	I, ornamental
Digitalis sp.	Foxglove	Exotic	I, ornamental
Elymus repens	Couch Grass	Exotic	C
Epipactis helleborine	Broad-leaved Helleborine	Exotic	O, along path, **poisonous**
Erigeron annuus	Annual Fleabane	Exotic	C
Galeopsis tetrahit	Brittle-stem Hempnettle	Exotic	I
Galium mollugo	Hedge Bedstraw (False Baby's Breath)	Exotic	O
Gnaphalium uliginosum	Marsh Cudweed (Low Cudweed)	Exotic	O
Hemerocallis fulva	Orange Day-lily	Exotic	O, ornamental
Hieracium aurantiacum	Orange Hawkweed (Devil's Paintbrush)	Exotic	O
Hieracium caespitosum	Meadow Hawkweed	Exotic	O
Hieracium floribundum	Pale Hawkweed (King Devil Hawkweed)	Exotic	C
Hieracium pilosella	Mouse-ear Hawkweed	Exotic	O
Leontodon autumnalis	Fall Dandelion	Exotic	C
Melilotus officinalis	Sweetclover	Exotic	C, edge of Hwy R.O.W.
Plantago major	Common Plantain	Exotic	C
Rhododendron sp	Rhododendron	Exotic	O, ornamental
Rorippa microphylla	One-row Watercress	Exotic	C, Hwy R.O.W. culvert exit
Senecio jacobaea	Tansy Ragwort	Exotic	O
Taraxacum officinale	Common Dandelion	Exotic	C
Trifolium campestre	Low Hop Clover	Exotic	C
Trifolium hybridum	Alsike Clover	Exotic	O

Name	Common Name	S-rank	Notes
Tussilago farfara	Colts-foot	Exotic	I
Vicea cracca	Tufted Vetch	Exotic	C

TABLE I3: FUNGUS AND LICHENS

Name	Common Name	S-rank	Notes
Hylocomium splendens	Stairstep Moss (Glittering Wood Moss)	S4S5	C
Lobaria pulmonaria	Lung Lichen	S4S5	O
Parmelia sp.	Shield Lichen	S4S5	C
Russula emetica	Emetic Russula		I
Usnea sp.	Old Man's Beard Lichen	S4S5	I

Non-vascular species were identified as observed but were not the target of this study. This list is incomplete and does not represent the full diversity of of fungi, lichens and non-vascular plants in this area.

TABLE I4: BIRDS

Name	Common Name	S-rank & Notes
Anas rubripes	American Black Duck	S5B, S4N
Archilochus colubris	Ruby-throated Hummingbird	S5B
Bombycilla cedrorum	Cedar Waxwing	S5B
Bonasa umbellus	Ruffed Grouse	S5
Catharus guttatus	Hermit Thrush	S5B
Catharus ustulatus	Swainson's Thrush	S5B
Certhia americana	Brown Creeper	S5
Colaptes auratus	Northern Flicker	S5B
Contopus virens	Eastern Wood-pewee	S4B
Corvus brachythynchos	American Crow	S5
Corvus corax	Common Raven	S5
Cyanocitta cristata	Blue Jay	S5
Empidonax minimus	Least Flycatcher	S4B
Geothlypis philadelphia	Mourning Warbler	S4B
Haemorhous purpureus	Purple Finch	S5B
Junco hyemalis	Dark-eyed Junco	S5
Megaceryle alcyon	Belted Kingfisher	S5B
Melospiza melodia	Song Sparrow	S5B

Name	Common Name	S-rank & Notes
Mniotilta varia	Black-and-white Warbler	S5B
Picoides villosus	Hairy Woodpecker	S5
Poecile atricapillus	Black-capped Chickadee	S5
Quiscalus quiscula	Common Grackle	S5B
Regulus satrapa	Golden-crowned Kinglet	S5
Riparia riparia	Bank Swallow	**S3B** male and female flying over area, nesting in barn near boundary to area O
Seivrus aurocapillus	Ovenbird	S5B
Setophaga americana	Northern Parula	S5B
Setophaga coronata	Yellow-rumped Warbler	S5B
Setophaga fusca	Blackburnian Warbler	S5B
Setophaga magnolia	Magnolia Warbler	S5B
Setophaga ruticilla	American Redstart	S5B
Setophaga virens	Black-throated Green Warbler	S5B
Sitta canadensis	Red-breasted Nuthatch	S5
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B
Spinus tristis	American Goldfinch	S5
Sturnus vulgaris	European Starling	Exotic
Troglodytes hiemalis	Winter Wren	S5B
Turdus migratorius	American Robin	S5B
Vireo olivaceus	Red-eyed Vireo	S5B
Vireo solitarius	Blue-headed Vireo	S5B
Zonotrichia albicollis	White-throated Sparrow	S5B

TABLE I5: ADDITIONAL INCIDENTAL OBSERVATIONS

Name	Common Name	Notes
Lepus americanus	Snowshoe Hare	Scat, browse
Procyon lotor	Raccoon	
Vulpes vulpes	Red Fox	

A number of invertebrate species such as cicadas, moths, butterflies, spiders and biting insects were noted but not identified.