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DEPARTMENT OF  
PLANNING & ZONING

# TREE MAINTENANCE PLAN

FOR

## BC COMMUNITY HOUSING, LLC



October 8, 2015

Burlington Community Housing, LLC  
Tree Maintenance Plan  
October 8, 2015



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TABLE OF CONTENTS

I. PROPERTY DATA SUMMARY.....3

II. INTRODUCTION.....3

III. PROPERTY DESCRIPTION.....4-5

IV. ~~LEGAL AND~~ ECOLOGICAL REVIEW.....5

V. PLAN OVERVIEW.....6

VI. AREA DESCRIPTION AND RECOMMENDATIONS.....7-16

VII. SCHEDULE OF ACTIVITIES.....17

APPENDICES.....18

A. Brett Engstrom Comments

B. Tree Management Map

~~C. T.J. Boyle Associates Site Concept Plans~~

~~D. Civil Engineering Associates, Inc. Plans~~

C. Soil Description

D. Invasive Exotic Plants Information Sheet

E. ISA ANSI Pruning standard Practices and Best Management Practices

## Section I. PROPERTY DATA SUMMARY

Property Concern: BC Community Housing, LLC

Address: Farrell Real Estate Company  
875 Roosevelt Highway  
Colchester, VT 05446

Property Location: 311 North Avenue, Burlington, VT

Orthophoto Number: 092220; Series 5000, 2013

## Section II: INTRODUCTION

Taking into consideration the conservation values of the property, this plan is designed to integrate the ownership objectives with the principles of sound forest and plant management, wildlife management, aesthetics, recreational use and other land use planning considerations.

The functions of this plan are designed to:

- Describe the woodland and open areas found on the Burlington Community Housing (BCCH) property which are as follows:
  - 1) ~~Eastern Cottonwood-White Poplar~~-Mixed Hardwood Woodland Restoration Area
  - 2) Black Locust Woodland Restoration Area
  - 3) Open Space to be Maintained for Public Access and Recreation
  - 4) Red Oak-Woodland Restoration Area
  - 5) Mid-Successional Woodland
- Document the various zoning and planning requirements to oversee all tree related issues
- ~~Provide assistance when planning for annual work plans and budgets~~
- ~~This plan is intended to make this parcel of land free of invasive species and to make it a clean walk-able forest with lake views while using sound silvicultural and arboricultural techniques. All activities will be overseen by a qualified consulting forester and/or a certified arborist. This plan is intended to promote the native plants which may have naturally occurred in this area by making this parcel of land free of invasives species~~
- ~~All~~-Silvicultural and arboricultural activities will be overseen by a qualified consulting forester and/or a certified arborist
- Encourage natural forest dynamics by retaining some coarse woody debris, snags and dead limbs where not along major trails

- Take into consideration the ecological characteristics of the site, including its potential former natural communities and any rare, threatened, and endangered species
- Take into consideration the public safety of those who use the land from hazardous trees and individuals seeking illegal shelter in the woods

### Section III. PROPERTY DESCRIPTION

The BCCH property is located in between the New and Old North End neighborhoods in western Burlington. It was formerly the orphanage of the Catholic Diocese and was subsequently purchased by Burlington College. Burlington College sold approximately 28 acres to BCCH of which the College retained approximately 6 acres. The property overlooks the shore and waters of Lake Champlain. The BCCH property shares 900 feet of frontage with the Burlington bike path, which runs parallel to the shoreline. The boundary line extends approximately 45 feet beyond the bike path towards the Lake.

To the south, BCCH neighbors City of Burlington land, a portion of which was the former Texaco parcel. To the west, the land abuts the Burlington Bike Path. BCCH owns approximately 1,000 feet of lake frontage beyond the bike path. This beach is commonly referred to as Texaco Beach. To the east, BCCH meets North Avenue. Lakeview Cemetery borders the property to the north.

In general, the land owned by BCCH is flat to gently sloping. The greatest change in terrain from is in the western portion of the property where the bank which drops to the lake level. This bank affords views towards Lake Champlain and New York State. The slope of the bank is fairly consistent, with two small ravines being the only exception. The surface area from the top of the bank to the bike path varies from 50 feet to 150 feet. The slope from the bike path to the shoreline is fairly consistent in both grade and distance.

In general the overall health and vigor of the plants growing at BCCH is considered fair-good in the northwest to poor in the southeast. The soil type is Adams-Windsor loamy sand which has limited growth potential (see Appendix D). Maximum productivity occurs when these soils are occupied with red oak, white pine or other relatively drought resistant plants. Other tree species found occupying the area are considered growing in an offsite condition and therefore don't express optimal growth and vigor. The key to achieving maximum growth and vigor of trees at BCCH is to encourage the growth of the tree species best suited to the site which include, but are not limited to: Northern Red Oak, White Oak & White Pine as well as specimen trees of varying species. When tree removal is required, discriminate against the removal of drought-resistant trees, such as those listed above. This approach will provide BCCH an increasingly more vigorous stand of trees, resulting in less maintenance costs and more overall enjoyment by the community. It has been stated that the open, grassy areas and those portions of map areas 3 and 3A are reclaimed sand pit.

#### *Invasive and Non-Native Plants:*

Invasive plants pose a threat to the natural health of forest lands, open lands, and wetlands in Vermont. Generally speaking, they are often non-native species that have escaped cultivation. After escaping, they tend to proliferate through aggressive propagation methods and colonize large areas. Populations are often very high and colonies can be very dense. Their aggressiveness excludes the

native plants. Ecosystem functions are negatively altered at the infestations sites. These plants generally do not provide the proper nutrients, habitat, or structure the native species provide. Nutrient, hydrologic, and fire regimes are also disrupted. Many of the species are also persistent, in that they can maintain their populations in small numbers until conditions are right for rapid spread.

A number of non-native and invasive plants are found on the BCCH property. Along with proper forest silvicultural practices, and wildlife enhancement projects, invasive species management places a vital role in fulfilling the commitment to natural resource health. The bulk of the invasive species include Common Buckthorn, Bush Honeysuckle and Oriental Bittersweet. These plants will aggressively be managed in the fall of 2015 and then subsequently on an annual basis.

#### Section IV. ~~LEGAL AND~~ ECOLOGICAL REVIEW

~~An in-depth review of state and local statutes and ordinances was conducted to ensure the actions recommended within this plan are in compliance. See Appendix A for a description of all applicable and pertinent legal documents to this project.~~

A review of ecological resources within the project area was conducted. This review analyzed the presence of rare, threatened & endangered species/natural communities, wetlands, riparian zones or any other unique features that would impact management decisions. According to data provided by the State of Vermont, there is one aquatic species and one natural community that are both mapped in close proximity to the project area. The aquatic species, Horned Pondweed, is categorized as critically imperiled in the State. This plant was last observed in 1985 along North Beach. A Lake Sand Beach natural community, which is categorized as imperiled in the State, is mapped along Texaco Beach. Additionally, the Department of Parks & Recreation has reported the presence of state-threatened Harsh Sunflower at the site.

We consulted with Mr. Brett Engstrom, an ecological and botanical consultant specializing in the inventory and mapping of wetland and upland natural communities, and the inventory of rare, threatened and endangered plants, in Vermont and adjacent states. Brett indicated an endangered plant, known as Prairie Red Root, has been previously identified on the City of Burlington lands south of the BCCH property. Although not mapped on the BCCH property, this is a very unique plant that has the propensity to grow in the area and should be monitored for. Mr. Engstrom felt confident that the invasives work could be completed provided the work crews are aware of the possibility of this plant.

In Vermont, Adams-Windsor soils are characteristic of the imperiled Sandplain Pine-Oak-Heath Forest natural community. While this rare natural community may have once occupied this site, it no longer exists, at least functionally, due to the site's extensive land use history.

Mr. Engstrom conducted an ecological inventory of the property to search for rare, threatened, and endangered species, and to assess native understory species, both shrubs and herbaceous species, which would enhance the natural character of the woodlands (See Appendix A). No rare, threatened, or endangered plants were located during his inventory. No significant natural communities are extant on the property due to the extensive land use history of the parcel. Brett's recommendation for restoration of the site is consistent with the management goals of this plan, namely invasive plant control and native species encouragement.

## Section V. PLAN OVERVIEW

~~This plan is designed to integrate the current natural resource base with the development of a 570-unit housing program.~~ This plan provides descriptions of five distinct vegetation zones as indicated on the tree management map (See Appendix B). Management recommendations provided are aimed at maintaining and optimizing the health and vigor in each unit described. Within each vegetation management unit, recommendations will be made to retain specific groups or individual trees. These recommendations include: the protection and maintenance of bank stability, selection criteria for tree removal, wildlife habitat enhancement, invasive plant control, native plant species promotion and, specimen tree retention and enhancement.

At all times tree and shrub work completed will be overseen by a qualified forester and/or arborist. The chosen professional will be consistent with maintaining erosion hazards along the fragile bluff soils. ~~Consideration of views to the shore from the housing program area will be commensurate with views from the shore.~~

## Section VI: AREA DESCRIPTIONS AND RECOMMENDATION

For management purposes, the property has been divided into five units or stands, which are defined as areas of relative similarity (such as age, species, topography, etc.) which can be treated uniformly. The land use areas are identified on the Tree Management Map, located in Appendix B. Each land use area included in this section contains a description, management objectives and recommendations section. ~~(see Appendix A).~~

## MAP AREA I & IA: 3 Acres

### ~~EASTERN COTTONWOOD~~-WHITE POPLAR-MIXED HARDWOOD WOODLAND RESTORATION AREA

#### DESCRIPTION:

This area is located in the southern portion of the property. The majority of this area is located north of the main recreation trail which enters into the property from North Avenue by the Community Garden. The vegetation consists of mixed hardwood tree and shrub species. A full species list is located at the end of this map area section. The overstory consists of small sawtimber (11.5"-17.5" diameter at breast height-DBH) trees. Structural defects and abnormalities are common throughout the overstory. The less desirable species, which include the Boxelder, aspen and poplar are less vigorous in the long term. The understory-midstory shrub layer is dense in this area. A multitude of invasive plants have established and are impeding the establishment and vigor of native species. The shrub/herbaceous layer consists primarily of buckthorn, honeysuckle and jewelweed as well as stinging nettles.

A small portion of this map area, occupying 0.08 acre, is located within the 250' setback from the 100' mean water table within which area special parameters must be met. More discussion of these parameters will be forthcoming in subsequent map area discussions.

A number of specimen trees have been identified in this area. A specimen tree is one that draws attention because of uniqueness or special beauty. Specimen trees in this area include a rather large White Oak, ~~Hackberry~~, American Elm and a Boxelder (Note: The Boxelder is on the boundary line with the City of Burlington Lands). The Boxelder has dozens of hypertrophies surrounding the stem and is located immediately adjacent to the main recreation trail.

Wildlife relies on a number of food sources to survive. One of the most important food sources is tree nuts and seeds, also known as mast. Oak is an important mast producer in Vermont. Other mast producers found in this area are black cherry, ~~hackberry~~, elm and butternut. Many den trees, or those with open holds or cavities in the main stem of the tree, were identified in this area. Standing dead trees, or snags, are found in this area. Snags are important as they provide both a shelter for nesting and food sources such as insects which live within the dead wood. A variety of bird species utilize snags including as chickadees, woodpeckers, and flickers among others.

#### MANAGEMENT OBJECTIVES AND RECOMMENDATIONS:

Restoration of the area is a primary objective. Invasive plant removal is necessary to encourage native understory vegetation. Specimen trees will be retained and their crowns should be maintained and released from competition with other trees. Mast-producers should be retained wherever possible and where they don't pose a safety threat to recreational path users.

An additional objective is to ~~maintain a generally neat appearance and~~ provide a safe environment for users of the recreational path. Trees that are located adjacent to the recreational path in high traffic areas must be treated as a valuable aesthetic resource and be maintained to provide a safe environment. Trees that are dead, dying or damaged should be removed for user safety. This includes trees with grape intertwined in their crowns, which can become a safety hazard in the event of a wind

storm. Review the woodlot on an annual basis, after leaf drop and add the clean-up work to the spring clean-up list. ~~From an aesthetic perspective, a broken limb or wind thrown tree is eye catching. Trees showing these conditions should be pruned or removed to provide a continuously safe environment, which also provides a visually pleasing woodlot.~~ Obviously dangerous trees should be pruned or dropped immediately. Coarse & fine woody debris should be retained according to commonly accepted guidelines, which are to maintain at least 3-5 stems at least 18" DBH and 10 stems at least 14" DBH per acre. Retain as many dead/dying trees as possible where they do not pose a public safety risk. During any management activities, protect the herbaceous/native shrubs as much as possible.

For the most part current stocking levels of mature and immature trees will ensure a continuous density of stems that provide the visual buffer desired. Single tree selection thinning is suggested to maintain good growth and sustainability of this stand. Recommended light thinnings will not affect the stand as a screen from the lake and bike path. ~~Tree crowns will be lifted and thinned to reduce wind "sail", thus minimizing the potential for wind damage.~~

#### Tree Species List:

Red Maple  
Red Oak  
Paper Birch  
Butternut  
American Elm  
Norway Maple (Class B Noxious Weed)  
Black Cherry  
White Poplar  
American Elm  
~~Hackberry~~  
~~Eastern Cottonwood~~  
Striped Maple  
White Oak  
Black Locust  
Boxelder

#### Shrub List:

Dogwoods (various species)  
Grape  
Canada Yew  
Bush Honeysuckle (Class B Noxious Weed)  
Common Buckthorn (Class B Noxious Weed)  
Multi-Flora Rose (Invasive Species)  
Bittersweet (Class B Noxious Weed)  
Japanese Barberry (Class B Noxious Weed)

## MAP AREA 2: 0.65 ACRE

### BLACK LOCUST WOODLAND RESTORATION AREA

#### DESCRIPTION:

This area is located in the southernmost tip of the property, south of the recreational path and west of Map Area 1. The primary vegetation is black locust which established approximately sixty years ago. This species has a beautiful fragrant spring flower, and nutritious seed source for a variety of wildlife species that may frequent these wooded corridors. Black locust has nitrogen-fixing bacteria on its root system, allowing it to establish on nutrient-poor soils. Although this species is a prolific root sprouting plant, there isn't a dense under/midstory cohort of black locust regeneration. In fact, the shrub-small tree layer in this stand is fairly open. Associated species include honeysuckle and dogwoods. Black Locust is not native to Vermont, although it is not listed as a noxious weed. One specimen tree, a healthy butternut, has been identified in this area. The shrub/herbaceous layers are absent in this stand.

Oak, butternut and locust are three important mast producers found in this area. Several den trees, or those with open holds or cavities in the main stem of the tree, were identified in this area. Some standing dead trees, or snags, are found in this area. Snags are important as they provide both a shelter for nesting and food sources such as insects which live within the dead wood. A variety of bird species utilize snags including as chickadees, woodpeckers, and flickers.

#### MANAGEMENT OBJECTIVES AND RECOMMENDATIONS:

Restoration of the area is a primary objective. Invasive plant removal is necessary to encourage native understory vegetation. The single butternut tree will be retained and their crowns should be maintained and released from competition with other trees. Mast-producers should be retained wherever possible and where they don't pose a safety threat to recreational path users. Retain as many dead/hazard trees as possible where they do not pose a public safety risk.

An additional objective is to ~~maintain a generally neat appearance and~~ provide a safe environment for users of the recreational path. Trees that are dead, dying or damaged should be removed for user safety. This includes trees with grape intertwined in their crowns, which can become a safety hazard in the event of a wind storm. Review the woodlot on an annual basis, after leaf drop and add the clean-up work to the spring clean-up list. ~~From an aesthetic perspective, a broken limb or wind-thrown tree is eye-catching. Trees showing these conditions should be pruned or removed to provide a continuously safe environment, which also provides a visually pleasing woodlot.~~ Obviously dangerous trees should be pruned or dropped immediately. Coarse & fine woody debris should be retained according to commonly accepted guidelines, which are to maintain at least 3-5 stems at least 18" DBH and 10 stems at least 14" DBH per acre. Retain as many dead/dying trees as possible where they do not pose a public safety risk. During any management activities, protect the herbaceous/native shrubs as much as possible. ~~Tree crowns will be lifted and thinned to reduce wind "sail", thus minimizing the potential for wind damage.~~

**Tree Species List:**

Black Locust  
Boxelder  
Red Maple  
Butternut  
Red Oak

**Shrub List:**

Dogwoods (various species)  
Grape  
Virginia Creeper  
Bush Honeysuckle (Class B Noxious Weed)  
Common Buckthorn (Class B Noxious Weed)

## MAP AREA 3 & 3A: 0.76 ACRE

### OPEN SPACE TO BE MAINTAINED FOR PUBLIC ACCESS AND RECREATION

#### DESCRIPTION:

This area includes five groupings of trees and a small (6/10ths of an acre) peninsula of trees. The five groupings of trees are situated in a field which is annually mowed. The groupings consist of cherry, aspen, gray birch and speckled alder. The peninsula is comprised of mixed hardwoods, primarily black locust.

Of the five groupings, one is located within the 250' setback from the 100' mean water table within which area special parameters must be met. A sliver of the peninsula also falls within the setback. The grouping and portion of the peninsula which fall within the setback will be passively managed (i.e. left alone).

The existing vegetation in the groupings and the peninsula is fairly young (<30 years) and is not desirable for retention silviculturally or aesthetically. Neither specimen trees nor significant wildlife habitat features have been identified in these areas. Common Buckthorn, a Class B Noxious Weed, is found within the groupings and the peninsula area. The area is surrounded by the only open land found within the area described in this plan, rendering it unique.

This area has a high value for recreational use and access. Currently the existing parking area is located south of the stone house ~~which is immediately adjacent to the proposed housing units #1 & #2. There is concern that the public will utilize the parking designated for residents of these units to access the recreational trails. The area currently occupied by the peninsula would provide a parking area for those accessing the recreational area, thereby removing the parking pressure from the resident parking.~~ The area is currently occupied by the groupings would provide an open grassy area for various recreational uses, such as soccer, football and wiffleball among others.

Another factor limiting the vigor of all of the trees in the area is mower damage. The damage is evidenced by open wounds and scar tissue on tree trunks at ground level. While many of the trees are capable of surviving this damage it limits the potential vigor of the trees and eventually can cause a hazard as the callous tissue repairing the wounds is not as strong as the original stem tissue. Over time, many of the trees would likely die due to excessive stress and damage caused by the ongoing mowing.

#### MANAGEMENT OBJECTIVES AND RECOMMENDATIONS:

Management of this area has one main purpose: recreation. With the exception of area 3a, the groupings should be removed for the creation of open recreational areas. Replacement plantings are recommended to enhance the landscape value. Suggestions for replacement species include native lilacs, viburnams, dogwoods and/or apple trees.

**Tree Species List:**

Gray Birch  
Speckled Alder  
Eastern Cottonwood  
Black Cherry  
Black Locust  
Green Ash  
White Pine  
American Elm  
Wild Apple

**Shrub List:**

Common Buckthorn (Class B Noxious Weed)

## MAP AREA 4: 1.92 ACRES

### NORTHERN RED OAK-WOODLAND RESTORATION AREA

#### DESCRIPTION:

This area is located in the northwestern and westernmost portion of the property and abuts the bike path right-of-way to the west. The vegetation consists of medium sawtimber sized (17.5" – 23.5" DBH) red oak, black oak and eastern cottonwood. This area is distinctly two-aged with a super-story canopy of oak-cottonwood and an under/midstory of Boxelder and Common Buckthorn. Common Buckthorn is a great forest health concern in this area as it has begun to dominate the understory.

There has been no disturbance in this area for decades, resulting in the most stately and oldest trees found on the property. The area is diverse topographically with the eastern sections situated on an escarpment and ravines to the west and the north. This diversity has resulted in a damp microclimate where jewelweed has established densely in the herbaceous layer. Stinging nettles are also abundant.

A number of specimen trees have been identified in this area. A specimen tree is one that draws attention because of uniqueness or special beauty. Specimen trees in this area include particularly large red oak, black oak and two very large (>40" DBH) cottonwoods.

Wildlife relies on a number of food sources to survive. One of the most important food sources is tree nuts and seeds, also known as mast. Oak is an important mast producer in Vermont. A few den trees, or those with open holds or cavities in the main stem of the tree, were identified in this area. Very few standing dead trees, or snags, are found in this area. Snags are important as they provide both a shelter for nesting and food sources such as insects which live within the dead wood. A variety of bird species utilize snags including as chickadees, woodpeckers, and flickers.

The primary recreational trail runs through this area and leads down to the bike path. Due to the sloping topography, there is a high risk for erosion due to runoff along this stretch of the trail. Most of this area falls within the 250' setback from 100' elevation.

#### MANAGEMENT OBJECTIVES AND RECOMMENDATIONS:

Restoration of the area is a primary objective. Invasive plant removal is necessary to encourage native understory vegetation. Specimen trees will be retained and their crowns should be maintained and released from competition with other trees. Mast-producers should be retained wherever possible and where they don't pose a safety threat to recreational path users. Retain as many dead/dying trees as possible where they do not pose a public safety risk.

An additional objective is to ~~maintain a generally neat appearance and~~ provide a safe environment for users of the recreational path. Trees that are located adjacent to the recreational path in high traffic areas must be treated as a valuable aesthetic resource and be maintained to provide a safe environment. Trees that are dead, dying or damaged should be removed for user safety. This includes trees with grape intertwined in their crowns, which can become a safety hazard in the event of a wind storm. ~~From an aesthetic perspective, a broken limb or wind thrown tree is eye catching. Trees showing these conditions should be pruned or removed to provide a continuously safe environment, which also~~

~~provides a visually pleasing woodlot.~~ Review the woodlot on an annual basis, after leaf drop and add the clean-up work to the spring clean-up list. Obviously dangerous trees should be pruned or dropped immediately. Coarse & fine woody debris should be retained according to commonly accepted guidelines, which are to maintain at least 3-5 stems at least 18" DBH and 10 stems at least 14" DBH per acre. During any management activities, protect the herbaceous/native shrubs as much as possible.

~~The area has high value for potential views of Lake Champlain and New York from proposed housing units #6-8. Trees will be lifted and the crowns will be thinned to remove deadwood and reduce wind obstruction by reducing the "sail" of the crowns. All work in this manner will consider both views to and from the lake.~~

**Tree Species List:**

Red Oak  
Black Oak  
Eastern Cottonwood  
Black Locust  
Gray Birch  
Paper Birch

**Shrub List:**

Grape  
Common Buckthorn (Class B Noxious Weed)  
Bittersweet (Class B Noxious Weed)  
Japanese Barberry (Class B Noxious Weed)  
Bush Honeysuckle (Class B Noxious Weed)  
Staghorn Sumac

## MAP AREA 5: 0.47 ACRE

### MID-SUCCESSIONAL WOODLAND

#### DESCRIPTION:

This area is located south of map area 4. The bike path right-of-way abuts this area to the west. The vegetation consists of mixed hardwood tree and shrub species. A full species list is located at the end of this map area section. The overstory consists of pole-sized trees (5.5"-11.5" DBH). This area constitutes the berm of what was historically used as a gravel pit and is one of the youngest areas. The understory-midstory shrub layer is moderately stocked in this area. This area falls entirely into the 250' setback from 100' Elevation.

#### MANAGEMENT OBJECTIVES AND RECOMMENDATIONS:

Restoration of the area is a primary objective. Invasive plant removal is necessary to encourage native understory vegetation. Specimen trees, if identified, will be retained and their crowns should be maintained and released from competition with other trees. Mast-producers should be retained wherever possible and where they don't pose a safety threat to recreational path users. Red Oak and high-quality Paper Birch are preferred for retention as they're exhibiting the greatest vigor and are the most aesthetically appealing trees in this area.

An additional objective is to ~~maintain a generally neat appearance and~~ provide a safe environment for users of the recreational path. Trees that are located adjacent to the recreational path in high traffic areas must be treated as a valuable aesthetic resource and be maintained to provide a safe environment. Trees that are dead, dying or damaged should be removed for user safety. This includes trees with grape intertwined in their crowns, which can become a safety hazard in the event of a wind storm. ~~From an aesthetic perspective, a broken limb or wind thrown tree is eye-catching. Trees showing these conditions should be pruned or removed to provide a continuously safe environment, which also provides a visually pleasing woodlot.~~ Review the woodlot on an annual basis, after leaf drop and add the clean-up work to the spring clean-up list. Obviously dangerous trees should be pruned or dropped immediately. Coarse & fine woody debris should be retained according to commonly accepted guidelines, which are to maintain at least 3-5 stems at least 18" DBH and 10 stems at least 14" DBH per acre. During any management activities, protect the herbaceous/native shrubs as much as possible.

#### Tree Species List:

Red Oak  
Black Cherry  
Eastern Cottonwood  
Black Locust  
Gray Birch  
Paper Birch

#### Shrub List:

Grape  
Common Buckthorn (Class B Noxious Weed)  
Bittersweet (Class B Noxious Weed)  
Japanese Barberry (Class B Noxious Weed)  
Bush Honeysuckle (Class B Noxious Weed)  
Staghorn Sumac

Section VII. SCHEDULE OF ACTIVITIES

MAP AREA	YEAR	DESCRIPTION
All	Annually	Assess ground and tree conditions and maintain as necessary
All	Annually	Manage for control of the invasive plants to include all invasives such as buckthorn and honeysuckle
1	2015	Removal of dead, dying, damaged or hazard trees, in particular there are many dead <u>poplar</u> and poor quality hazard box elder trees to be removed, <del>there is also a specimen Hackberry that will be released.</del> Trees will be pruned to ISA standards and Best Management Practices. Specifically manage for late successional species such as the oaks
2	2015	This area has a specimen butternut that will be released. Manage the invasives and prune to reduce branch hazards. Trees will be pruned to ISA standards and Best Management Practices. This area will be managed for Black Locust
3	2015	Clear groupings and portion of peninsula for recreational areas, the alder patch will remain
4	2015	Removal of dead, dying, damaged or hazard trees including and especially the several box elder trees which are over hanging the several trails in this area. Manage for the control of the many invasive species. Prune & Lift <del>for view-clearing</del> following the ISA pruning standards and Best Management Practices. This area will be primarily managed for the oak species and cottonwoods
5	2015	Removal of dead, dying, damaged or hazard trees Crop Tree Release of Red Oak & Paper Birch Prune & Lift <del>for view-clearing</del> . Trees will be pruned to ISA standards and Best Management Practices. This area will be specifically managed for the large and small oaks as well as the white birch component.
All	2020	Review Objectives & Update Tree Maintenance Plan

\*\* All activities will be completed in a way to ensure the continued stability of the escarpment on top of slope soils

## APPENDIX

APPENDIX A.  
BRETT ENGSTROM COMMENTS

**APPENDIX B.  
TREE RESOURCE MAP**

## APPENDIX C. SOIL DESCRIPTION

### ADAMS SERIES

The Adams series consists of deep, loose, excessively drained soils that are sandy throughout. These soils are level to steep. The larger areas are in Milton, Jericho, and Essex, east of the Windsor soils, and at higher elevations. Smaller areas of Adams soil are in Underhill, Bolton, and Richmond, and in stream valleys of the Green Mountains.

These soils developed in sandy beaches, deltas, and terraces. The sand is deeper than 4 feet. In most places it is underlain by stratified sand, gravel, sandy loam, loam glacial till, clay, silt, or bedrock.

In a representative profile the surface layer is an unplowed area is black loamy sand, high in content of organic matter, and about 1 inch thick. Under this is a layer of light brownish-gray loamy sand about 6 inches thick. In cultivated areas, these two layers are mixed with some of the subsoil to form the very dark grayish-brown loamy sand plow layer. The subsoil is very friable or loose loamy fine sand about 23 inches thick. It is dark reddish brown in the upper part, dark yellowish brown in the middle part, and yellowish brown in the lower part. The substratum is grayish-brown loamy fine sand to a depth of about 45 inches or more.

The bright colors and lack of mottles in the Adams soils indicate that they are well aerated and porous. The soils are rapidly permeable, have a moderately low available moisture capacity, and have very low natural fertility. These soils are filled to capacity with available moisture at the start of the growing season. As the growing season progresses, rain normally is not adequate to replenish the soil moisture used by plants. Crops, therefore, show signs of lack of moisture during the growing season. These soils warm faster in the spring than the more silty, more clayey, or wetter soils in the county. These soils are susceptible to soil blowing where un-vegetated. Adams soils have a low shrink-well potential.

The Adams soils are used mainly for corn, pasture, and hay in farming areas and for housing developments, industrial sites, and roads near villages and cities. They have been farmed intensively, but many areas of Adams soils are now in trees or brush.

### ADAMS AND WINDSOR LOAMY SANDS, 0 TO 5 PERCENT SLOPES

The Windsor soil is predominant in this mapping unit, but an area may consist of either the Adams soil, the Windsor soil, or of a mixture of the two. These soils occupy irregularly shaped terraces 2 to 200 acres in size. The irregular shape is due to the many gullies dissecting the sand plains. The profiles of the Adams and Windsor soils are the ones described as representative for the respective series.

Included with these soils in mapping are some areas of Adams and Windsor soils that have a thin surface layer where soil blowing has taken place. These areas are roughly circular in shape and less than 100 feet in diameter. Also included are areas of soil in which the content, by volume, of gravel, cobblestones, and stones averages more than 15 percent between depths of 10 and 40 inches. Some of the areas mapped contain areas of Deerfield soils and Colton soils. Areas that have stones and cobblestone on the surface are also included. In a few areas, the surface layer is sand or fine sand. In many areas this mapping unit is slightly acid or neutral throughout.

These soils are used for truck gardening, inter-tilled farm crops, hay, and pasture. They have few limitations for many non-farm uses such as housing developments. A large part of this mapping unit is woodland or idle.

Surface runoff is very slow. The ground should be kept well covered by vegetation to prevent soil blowing. On these soils the hazard of water erosion is very slight, even in non-vegetated areas. (Both parts, capability unit IIIs-1; both parts, woodland suitability group 4s1).

Information taken from:  
Chittenden County Vermont USDASCS; 1974

APPENDIX D.  
INVASIVE EXOTIC PLANTS INFORMATION SHEET

**APPENDIX E.**  
**ISA ANSI PRUNING STANDARD PRACTICES AND BEST MANAGEMENT PRACTICES**



Submitted at DRB  
10/6/15

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Ecological Assessment of BC Community Housing, LLC, property  
Burlington, Vermont

6 October 2015

This ecological assessment represents the results of a ten-hour field inventory of the BC Community Housing property I made on October 5 for owner Eric Farrell. I used the stand data and descriptions in the Tree Maintenance Plan, September 2015, by Greenleaf Forestry of Westford, VT, as background information, and will refer to the five woodland areas of the Tree Management Map of that plan in this report.

Woodland areas 1-4, plus the woodland within the planned housing area, are composed of canopy, understory, and groundcover plants indicative of highly disturbed forests. These woodlands are dominated by non-native species, some of which are invasive, and early successional and/or weedy native species. The prevalence of black locust, box elder, cottonwood, quaking aspen, white poplar, and Norway maple as canopy or subcanopy trees; common buckthorn and other woody invasives in the understory; and invasive garlic-mustard and non-native celadine in the ground layer is characteristic of areas that were cleared of native forest, and where the soil has been disturbed. A review of old aerial photographs of the property reveals that much of what is forested today was field or developed ground in 1937, with the notable exception of the west corner (area 4) and slope down to what is now the bike path (area 5). Furthermore, a 1974 photo shows sand was removed from a large area in what is now the lowest portion of field and woodlands.

The result of this past heavy land use history is that the woodland areas 1-4 are not recognizable as any natural community in the Vermont natural community classification (as described in Thompson & Sorenson's *Wetland, Woodland, Wildland*). In the "Redevelopment of the Catholic Diocese Property: Report for the Mayor of the City of Burlington" dated Nov. 12, 2001, Eric Sorenson, Community Ecologist for the Vermont Fish & Wildlife Department, describes a remnant patch of pine-oak-heath sandplain forest in woodland area 4. This is a rare natural community in Vermont that once characterized the extensive post-glacial delta sand deposits of western Chittenden County. Given the Adams-Windsor sandy soils characteristic of the sandplain community at the site, he describes the remnant as potentially of local significance, but not of statewide significance. I revisited this area and relocated the group of red oak and red maple he describes, but no characteristic sandplain natural community shrubs and groundcover. Instead I found many weedy species that would indicate moister soil conditions than typical sandplain natural community. There is a small flat area at the top of the slope in area 4 that the cemetery is currently using as a leaf/branch/stump dump that may have had some remnant sandplain species, but have been smothered by the dumping of organic material.

Woodland area 5 includes the very steep bluff slope leading down to the bike path. From an ecological perspective, I found this to be the most intact woodland on the property. It has a red oak-red maple dominated canopy with lesser amounts of a variety of other native hardwoods, and one pitch pine. The understory and groundcover includes many native shrubs and herbs, and few non-native and/or invasives. Interestingly, the species composition of the forested slope does not fit a pine-oak-heath sandplain forest natural community type. Instead, it might be classified as a red oak-northern hardwood forest type.

- ✓ I found no rare, threatened, or endangered plants during my autumn field inventory, though there was potential habitat for some rare species that I am familiar with from sandplain forest and other natural communities in western Chittenden County. In his comments on the Tree Maintenance Plan, Dan Cahill, Land Steward of the city's Park & Recreation Department, mentions the presence of Harsh Sunflower (*Helianthus strumosus*) on the property. I contacted Bob Popp, the Nongame and Natural Heritage Program botanist, who stated he had no
- ✓ knowledge of this state-threatened species at the site. Nor does the species appear at this site in the BioFinder GIS database on the web. I searched for the Harsh Sunflower and did not find it, though I did find a closely related Woodland Sunflower (*Helianthus divaricatus*) on the steep slope of woodland area 5. Woodland Sunflower is not a listed species in Vermont.

I could not confirm the species identity of Serviceberry, or Juneberry (*Amelanchier* sp.), that I found growing as a small tree/tall shrub on the bluff slope in woodland area 5. Based on the leaf shape, it might be *Amelanchier canadensis*, a species ranked SH, or State Historical, because it is known only from historical specimens. A return visit when it flowers in the spring is needed to positively identify the species.

As a final comment, I would recommend that the tree maintenance program strongly encourage the native species present at the site by removal of non-natives, and by thinning of both native and non-native species that would allow a greater diversity of native plants to thrive at the site. I am very much in favor of the idea of restoring the forest natural community at the site. But this goal is problematic, and would take a long time. It is problematic because it is not clear exactly what the presettlement natural community was at the site due to its heavily altered current condition. Also, many species that were part of the original natural community are no longer present and must migrate back to the site, or be reintroduced. Finally, the site is plagued with an abundance of invasive species.