



Audubon VERMONT

**Forest Bird
Habitat Assessment
and
Management
Recommendations**

**Wu Ledges Town Forest Property
Waitsfield, Vt.**

**Prepared by
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December 16, 2008**

Introduction

The purpose of this document is to provide an assessment of forest bird habitat on the Wu Ledges Town Forest property in Waitsfield, Vt. and to offer management recommendations that will protect, create and/or enhance habitat conditions for responsibility forest bird species and species showing population declines as identified by Audubon Vermont's Forest Bird Initiative (FBI) program.

A responsibility species is a bird species with a high proportion of its global breeding population found in the Northern Forest region. See Appendix B for a complete list of FBI responsibility species.

The roughly 125 acre property is located in the Atlantic Northern Forest Bird Conservation Region (BCR 14) as delineated by the North American Bird Conservation Initiative (NABCI).

The Atlantic Northern Forest encompasses a geographic area stretching southwest to northeast from the Taconic hills of eastern New York/western Massachusetts and the Adirondack Mountains (cut off from the remainder of the BCR by the Lake Champlain valley), through most of Vermont, New Hampshire and Maine, Quebec south of the St. Lawrence River including the Gaspé Peninsula, and all of the Maritime provinces of New Brunswick, Prince Edward Island, and Nova Scotia. (BCR14 Blueprint page 7.) (Figure a). Predominant general forest types include spruce-fir, northern hardwood, and mixed deciduous-coniferous forests.

Audubon Vermont has identified the landscape west of Waitsfield, Vt. as the Battell Forest Bird Block, denoting its high importance to conserving responsibility bird species (Figure b). The Block is approximately 276,000 acres of contiguous forest land bounded roughly by the Winooski River on the north, Mt Horrid on the south, VT Route 100 in the east and VT Routes 116 and 7 on the west. This block is approximately 91% forested.

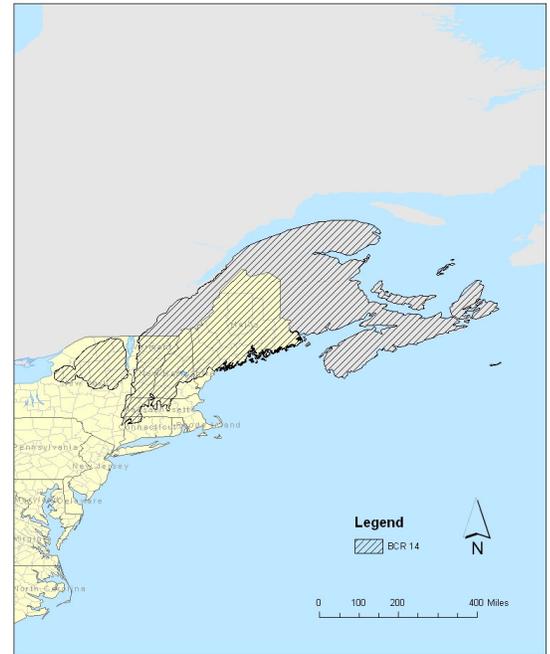


Figure a. Forest Bird Conservation Region 14

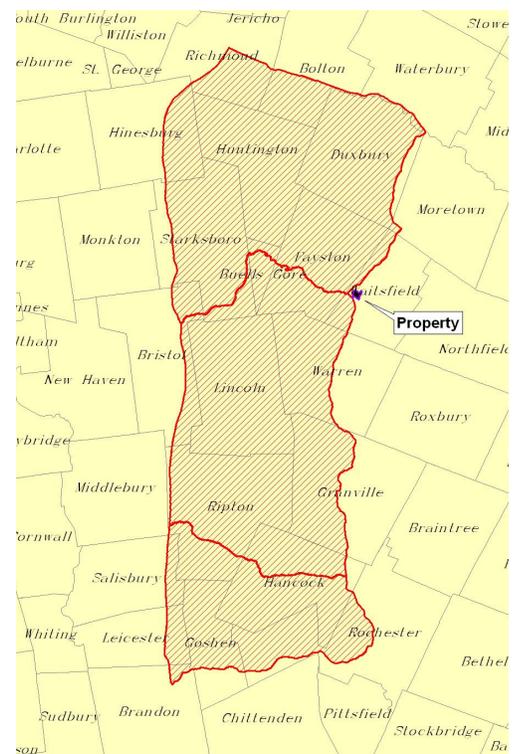


Figure b. Audubon Vermont's Battell Block

Landscape Context

A consideration of the property's surrounding landscape (an area approximately 10 times the acreage of the parcel in question) is an important component of assessing current habitat conditions and making management recommendations. The approximately 1200 acre landscape around the Wu Ledges Town Forest parcel includes a mix of somewhat dense commercial development, scattered residential development, some agricultural land and interior forest (Figure C). There is a considerable amount of "edge" within the landscape, that is border between open and forested land. The property occupies roughly half of an interior forest block which is surrounded by development of varying density. The village of Waitsfield is a significant fragmenting feature within the landscape. Although the route 100 corridor to the southwest of the property receives a considerable amount of traffic, which may limit connectivity in that direction for land based wildlife, the forest interruption is fairly narrow and probably does not pose a significant barrier to birds. In contrast, the East Warren Road corridor to the east sees less traffic, but the landscape is quite fragmented by residential development reaching into the forest. In order to provide habitat for a range of responsibility species, the landscape context lends itself to a focus on retaining and maintaining current mature and interior forest (>300 feet from open land) conditions with limited openings mimicking natural disturbances to encourage structural vertical diversity within the forest. Where the property borders open developed or agricultural areas, care should be taken to provide a "soft edge" transition to mitigate impacts of the nearby disturbances. All aquatic features, including streams, wetlands and vernal pools should be protected.

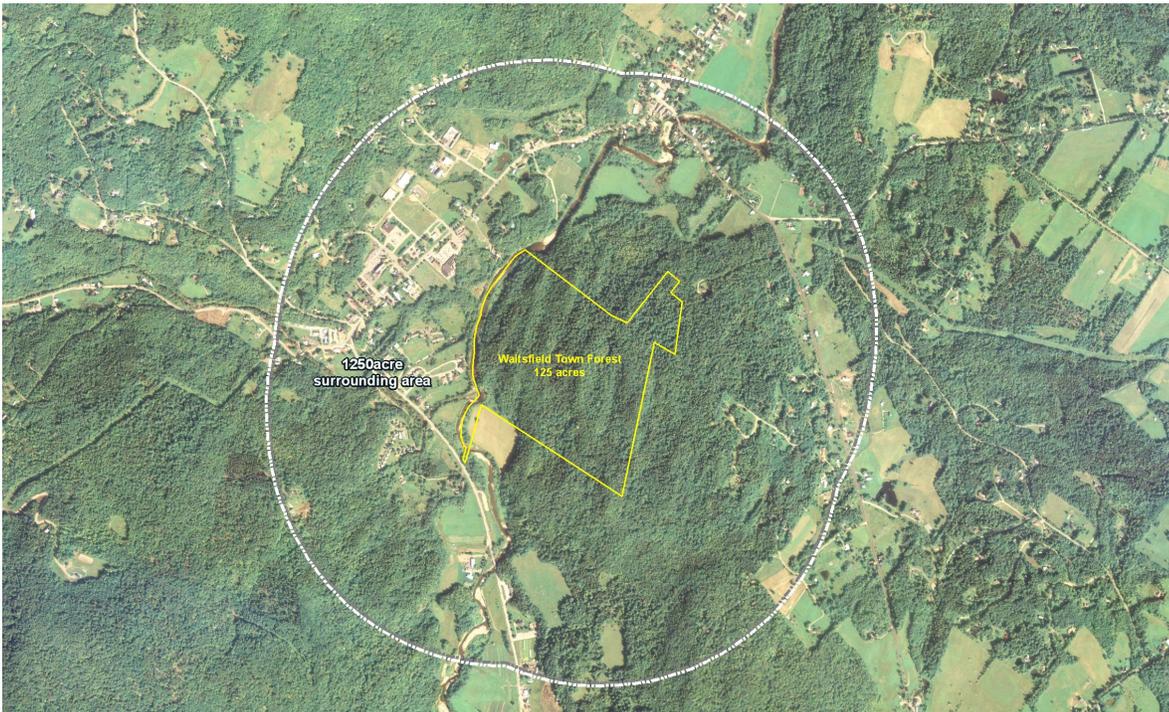


Figure c. Landscape surrounding parcel

Landowner Objectives

Landowner management objectives, as detailed in the Interim Management Plan are to maintain the existing non-motorized recreational opportunities. The Waitsfield Conservation Commission is seeking additional input and site analysis upon which to base further management objectives and goals. This assessment is one component of the additional analysis.

Property Description

The Wu Ledges Town Forest is located along the Mad River just east and south of the village of Waitsfield. Forest cover in the parcel is quite diverse, ranging from northern hardwood, to mixed forest, to conifer dominated areas. Tree species typical of these communities are found throughout the property including sugar maple, white ash and American beech in the hardwood areas, with increasing amounts of hemlock and occasional red spruce entering the picture in the mixed forest zones, finally transitioning to concentrated hemlock forest. These are common forest types in low to mid elevations of the region, and they are found in a distinct topographical relationship within the Wu Ledges parcel- with the hardwoods along the bottom of the draws and lowlands, and hemlock dominating the north-south oriented ridgelines, outcrops and steep slopes. The mixed woods form transition zones between the two. Characteristic responsibility bird species of hardwood forest stands include the black-throated blue warbler, yellow-bellied sapsucker, wood thrush, scarlet tanager, ovenbird, and the American redstart. The hemlock stands are more likely to attract species such as the blackburnian warbler, blue-headed vireo and purple finch, with considerable species overlap occurring in the mixed forest areas. Additional land cover features include the riparian zone along the Mad River and an old field at the south-west corner. The property contains some small intermittent streams, a notable vernal pool, a couple of softwood-swamp wetlands and several seepage wetlands. Because none of the wetlands have been identified through the National Wetland Inventory they likely have a Class 3 designation. The Vt. Dept of Fish and Wildlife has mapped the entire parcel as deer-winter habitat (deeryard). The presence of appropriate winter cover necessary to the survival of white-tailed deer was confirmed by a 2007 natural heritage assessment by Arrowwood Environmental¹. Timber harvesting has been a part of the property's history over the years, with a portion of the property having been harvested recently. Skid trails used for harvest activity are re-vegetated and utilized in many cases as recreational trails.

Habitat units have been delineated based on a qualitative on-the-ground analysis for purposes of easy identification and as a basis for management recommendations. These habitat units are

- 1) Northern Hardwood Forest (includes some mixed forest areas)
- 2) Hemlock Forest (includes some mixed forest areas)
- 3) Cliff and Talus Ridge
- 4) Old Field
- 5) Significant Wetlands & Buffers
- 6) Mad River Riparian Zone

Site visit was conducted on May 14th, 2008.

The following pages provide an assessment of current habitat conditions and forest management recommendations that would enhance habitat for forest responsibility bird species on the property. The recommendations are designed to be discussed with the property's forester or land manager and implemented where practical and appropriate.

Contact Steve Hagenbuch, Audubon Vermont Conservation Biologist, at 802-434-5827 or shagenbuch@audubon.org for more information on the recommendations outlined in this report.

1. Northern Hardwood Forest – 53 acres

Area description:

This habitat unit is located primarily in the draws between ridgelines and flatter areas of the property. A large area of this habitat type runs north and south along and near the eastern boundary of the property, and another, again north-south oriented, is located in the center of the parcel. This unit is generally a northern hardwood forest community with some areas of rich northern hardwood forest. The forest canopy is primarily sugar maple, American beech and yellow birch with other hardwood cohort species present in varying amounts. The understory within the unit is mostly comprised of beech and striped maple, with rhus (raspberry and blackberry) species sometimes present. In some openings there are dense stands of ostrich and other ferns. Slopes in this unit are generally gentle to moderate.



Figure d: Rich Northern Hardwood Forest in Unit 1

Assessment of Current Conditions:

This unit is a classic northern hardwood forest typical of the region. This hardwood habitat occupying the lower and often flatter topography on the property has seen the most management activity as is evidenced by some areas of open canopy generated by past small group and single-tree selective cutting. Also due to the topography of the parcel, skid roads, as well as sensitive features like streams, seeps and wetlands tend to be located within the narrow arms of this unit. Tree size



Figure e: Ostrich ferns dominate the understory in this small group-cut

ranges from pole to sawtimber, with some areas of dense understory dominated by striped maple and beech saplings. Recent harvesting in this unit appears to have been primarily single-tree selection with some small groups selection in certain locations. Some areas in which the canopy was opened through harvesting now have a dense ground-cover of ferns which may be limiting regeneration. Other areas are seeing a flush of raspberry and blackberry (*rhus*)- the fruits of which have been found to be of great importance to interior forest nesting birds during the time between the breeding season and migration. To the extent possible, management activities should encourage *rhus* species and discourage fern glades.

Vertical diversity refers to a varied mix of vegetation heights (seedlings, saplings, mature trees). Vertical diversity is especially beneficial to forest birds that build their nests lower in the forest canopy such as the black-throated blue warbler, American redstart and wood thrush, and but also provides structure and feeding opportunity for birds that nest at all levels of the forest canopy. Vertical diversity in this unit is generally moderate, management activities such as harvesting and girdling could be used to further increase understory throughout the unit.



Figure f: Leo Laferriere girdling a white ash to create a snag

Snags (standing dead trees) that are important nesting habitat for several species including the yellow-bellied flycatcher and northern flicker are present throughout the unit at varying densities, a goal of 6 snags per acre with 3 >16" in diameter should be sought. This can be done through retaining dead, dying and old trees and by girdling (see appendix 4).

Coarse woody debris, large woody material (*ie.* tree trunks) and slash piles on the forest floor, is likewise present in moderate quantities and should be retained and encouraged as this provides nesting opportunities for species such as the veery and

white-throated sparrow that tend to build their nests in and under brush piles and downed logs.

Birds noted in this unit during assessment included ovenbird, black-throated blue warbler, yellow-bellied sapsucker and hermit thrush.

Continued use of small group selection techniques will help to maintain the interior forest quality of this unit by mimicking natural disturbance events which will continue to enhance nesting opportunities for a variety of species.

Management Recommendations:

- The use of uneven-aged silvicultural methods, with single-tree and group selections that create canopy openings of up to 1-2X canopy height will promote advanced regeneration and shrub development such as that utilized for nesting by the black-throated blue warbler and several other species. These methods of tree harvesting will maintain the overall interior forest conditions that exist over this habitat unit. Additionally larger openings may result in the growth of blackberry/raspberry and other soft mast producing trees and shrubs which are important food sources for many forest birds during the post-breeding season. These openings may also provide a density of regeneration and shrub development to provide breeding habitat for some species of early-successional forest birds, but this form of silviculture will not create a true early-successional bird community. The shape of group selection cuts should be

circular to maximize functionality of regenerating conditions. Actual location and size of harvests should be determined by the property's forester.

- Specific information was requested regarding the use of larger “patch cuts” as a habitat management tool within this unit. Due to the interior forest conditions, limiting topography and the position within the larger landscape, larger group selection cuts are not recommended at this time within this unit. The smaller group selections mentioned above could be clustered in the few wider areas of the unit, at least 300 feet from the forest/non-forest edge.
- Standing snags and downed trees are of significant value to many species of wildlife. Dead or dying standing trees provide roosting, perching, foraging, and nesting sites for roughly 40 species of birds. Retain a minimum of six snags per acre, with one exceeding 18 in. DBH and three exceeding 16 in. DBH. Also retain some live trees of poor form and quality to serve as the next cohort of snags and CWD. If target number of snags does not exist, consider girdling poor quality trees in order to achieve abundance objectives. See Appendix D for more information on girdling.
- Forest access roads and recreational trails can serve as pathways for increased predation and nest parasitism. Minimize the width, number, and extent of new access and skid roads built for a harvest and utilize the current trail system as much as possible. Road/trail widths less than 25 ft. are preferred. Wider roads may serve as fragmenting features. If consistent with other uses, allow trails to re-vegetate between harvests. Whenever possible maintain forest canopy closure of 70 percent or more over access roads and trails.
- The tops of harvested trees that are left in the forest contribute to vertical structure, an important habitat feature. Minimize the use of whole tree harvesting and leave as much slash (branches, limbs, etc.) as possible.
- Exercise care when harvesting near streams and forest wetlands. Maintain buffers of at least 50 ft. (200' has greatest value) along streams and wetlands in which trees are not harvested or harvested very lightly and only during frozen ground conditions.
- Yellow birch is of particular importance to insectivorous birds. The 10 most common foliage-gleaning bird species in our forests, including Blackburnian warbler, black-throated green warbler, and scarlet tanager, prefer yellow birch for foraging. Retain yellow birch as a forest component.
- If summer harvesting is required, it should be scheduled before the arrival of migrant bird species (generally the third week of May if soil conditions permit) or after the second week of July, which will allow breeding birds to fledge a first brood. If summer harvesting is not required, harvesting during frozen ground conditions is preferred as it will have no impact on the breeding bird community. Due to the seepy wetland conditions that exist in many areas of this unit, winter harvesting is strongly encouraged.

Target Responsibility Bird Species:

- | | |
|----------------------------|-------------------------------|
| ☛ Ovenbird | ☛ Eastern Wood-Pewee |
| ☛ Ovenbird | ☛ Scarlet Tanager |
| ☛ Wood Thrush | ☛ Northern Parula |
| ☛ Veery | ☛ American Redstart |
| ☛ Yellow-bellied Sapsucker | ☛ Black-throated Blue Warbler |

2. Hemlock Forest - 42 acres

Area description:

This habitat unit consists of several areas throughout the property with a tree canopy dominated by hemlock forest. The multiple areas of this unit all display similar forest composition, characteristics and recommendations for the management and enhancement of bird habitat. As noted, the dominant tree species within this unit is eastern hemlock. There are occasional hardwood (often beech) or red spruce trees that occupy the canopy, and toward the edges of these areas, greater amounts of hardwood species are typical as this unit transitions toward the hardwood stands of unit 1. The areas within this unit



Figure 8: Hemlock Forest, Unit 2

tend to be steep and rocky, located on the summits and side slopes of the many north-south running ridges on the property. Soils are generally shallow with occasional bedrock outcrops.

The areas of this unit appear to have seen less forest management activity than the areas of Unit 1, although some areas are more readily accessible and some cutting has been conducted in the recent past.

Assessment of Current Conditions:

While timber harvesting has no doubt been a component of land management over the years in this unit, the forest tends more toward a more mature though often even-aged structure. This is not atypical in softwood dominated stands, especially hemlock, as the dense canopy of these long-lived and slow growing trees shades the forest floor reducing understory regeneration. The pre-dominant softwood presence also sets this unit apart from a habitat perspective, as birds such as the blackburnian warbler, purple finch and black-throated green warbler are more likely to be found nesting here.

Trails in this unit are generally small and used for recreational activities such as hiking, snowshoeing and skiing. Tree size varies, with some areas of predominantly pole timber and other areas with old large sawtimber-sized trees, most notable in harder to reach locations. As mentioned above, the vertical diversity of the forest is somewhat low (trees tend to be even-aged), although a few areas

with heavy understory were noted. The blue-headed vireo, another softwood nester is unique in this group in that it locates its nest lower in the canopy than the others listed above. This species would benefit from additional areas of understory for suitable nesting habitat.

Snags are present, but in fairly low numbers throughout the unit, with only the central ridgeline showing the recommended 3 per acre over 16" DBA (diameter at breast height). Girdling a few trees will help increase the habitat value in this area. It may be desirable to focus girdling activity on the larger hardwood trees in the unit, thereby retaining the large hemlocks.

Coarse woody debris varies throughout the areas of this unit. In addition to the nesting structure previously mentioned, this debris is important for birds such as the ruffed-grouse which use it as drumming perches as well as the wood thrush, veery and other ground-feeding birds that find important food resources such as insects and amphibians in decaying debris. Low levels of coarse woody debris is also typical in slow-growing hemlock forests, and efforts should be made to retain or create this habitat feature when possible.

There are wintering white-tailed deer in this unit, which can be a mixed blessing. Although deer are an important part of our landscape and they require dense softwood stands to survive harsh winters, their browse (especially of young hemlock) in concentrated areas such as this can significantly reduce understory regeneration success. This resulting lack of understory reduces nesting opportunities for birds and restricts the regenerating capacity of the forest. If deer browse appears to be an issue, it may be desirable to employ some protection devices such as fencing or tubes on saplings in regenerating areas to allow them a chance to survive.

Birds noted during the assessment included most of the conifer forest birds noted above including, black-throated green warblers, blue-headed vireo and blackburnian warblers.

Management Recommendations:

- The use of the uneven-aged silvicultural methods of single-tree and group selection harvests with a diameter $\leq 1 \times$ height of canopy trees releases advanced regeneration and promotes shrub development without opening too much of the canopy.
- Standing snags and downed trees are of significant value to many species of wildlife. Dead or dying standing trees provide roosting, perching, foraging, and nesting sites for roughly 40 species of birds. Retain a minimum of six snags per acre, with one exceeding 18 in. DBH and three exceeding 16 in. DBH. Also retain some live trees of poor form and quality to serve as the next cohort of snags and CWD. If target number of snags does not exist, consider girdling poor quality trees in order to achieve abundance objectives. See Appendix D for more information on girdling.
- The tops of harvested trees that are left in the forest contribute to vertical structure, an important habitat feature. Minimize the use of whole tree harvesting and leave as much slash (branches, limbs, etc.) as possible.
- Forest access roads and recreational trails can serve as pathways for increased predation and nest parasitism. Minimize the width, number, and extent of new access and skid roads built for a harvest and utilize the current trail system as much as possible. Road/trail widths less than 25 ft. are preferred. Wider roads may serve as

fragmenting features. Whenever possible maintain forest canopy closure of 70 percent or more over access roads and trails.

- If summer harvesting is required, it should be scheduled before the arrival of migrant bird species (generally the third week of May if soil conditions permit) or after the second week of July, which will allow breeding birds to fledge a first brood. If summer harvesting is not required, harvesting during frozen ground conditions is preferred as it will have no impact on the breeding bird community.

Target Responsibility Bird Species:

- 🐦 **Blue-headed Vireo**
- 🐦 **Black-throated Green Warbler**
- 🐦 **Blackburnian Warbler**
- 🐦 **Purple Finch**

3. Cliff and Talus Ridge - approx 3 acres

Area description:

This habitat is located in the south-central portion of the parcel and consists of a hemlock forest rising up to a prominent ridge with a west-facing cliff face affording dramatic views over the town of Waitsfield and Green Mountain ridgeline. At the base of the cliffs is a small talus field with numerous large chunks of bedrock debris fallen from the cliff face. Notable at the summit are low-bush blueberry shrubs, indicative of the shallow acidic soil at the edge of the cliff-top.

Assessment of Current Conditions:

The forest structure at the top is much like that in unit 2, what sets this unit apart is the presence of unusual habitat features; the cliff and talus field. These features, used by a variety of wildlife, are unusual in the area and merit specific attention and care. In addition, there are trails leading to the top of the cliffs to access the western views, making this a significant scenic and recreation resource.

This unit is primarily hemlock with occasional hardwoods as in unit 2. The talus slope below the cliffs contains clumps of mountain maple in and amongst the boulders. At the summit, most trees are pole sized (<10" DBH), with the talus area dominated by herbaceous plants and shrubs.

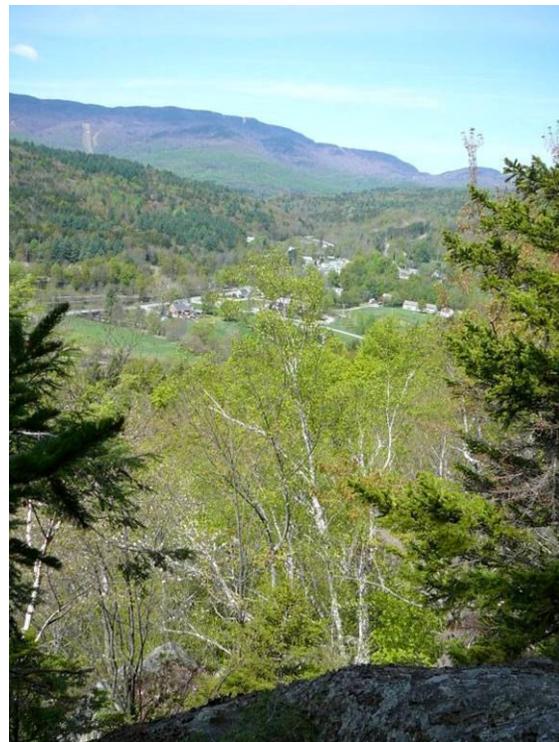


Figure h: View from summit of Unit 3

Birds nesting in this unit would tend to be those showing some preference to conifer dominated areas, with both black-throated green warblers and blue-headed vireos noted during the assessment. A raven nest was observed on a shelf in the cliff face. While the raven is not a responsibility species, they have very specific nesting requirements- open cliff faces with broken shelf-like platforms. Because this unit is providing appropriate structure for successful raven nesting, it is recommended that consideration of this species be included in any management activities.



Figure i: Raven nest on cliff face

Management Recommendations:

- No active management is required to provide habitat for the target species listed below. This is a unique ecological feature and as such warrants retaining.
- This unit affords excellent views and is a popular destination for local residents. Regular maintenance of recreation trails and viewsheds is an important management activity. Exercise extreme care, and consider consultation with a wildlife biologist and/or ecologist for any management activities including trail construction to minimize impacts to bird nesting and sensitive natural communities.

Target Responsibility Bird Species:

Hemlock Ridge

- ☛ Black-throated Green Warbler
- ☛ Blackburnian Warbler
- ☛ Purple Finch
- ☛ Blue-headed Vireo

Talus Slope

- ☛ Ovenbird
- ☛ American Redstart
- ☛ Black-throated Blue Warbler
- ☛ Canada Warbler
- ☛ Nashville Warbler
- ☛ Mourning Warbler
- ☛ Magnolia Warbler
- ☛ White Throated Sparrow

4. Old Field – 4.5 acres

Area description:

This habitat unit is located at the south-western end of the property, near the edge of the Mad River. This unit, sloping moderately to the south west, was formerly an agricultural field, probably pasture. Currently, the unit has patchy shrubs and small trees typical of these conditions including aspen and red maple. The canopy is still fairly open, but invasive honeysuckle is present in the understory. There are occasional shallow soils or rock outcrops.

Assessment of Current Conditions:

This unit has an early-succession transition structure that is important nesting habitat for several responsibility species, and is not found elsewhere on the property. This old-field type habitat is becoming exceedingly rare throughout the region as abandoned farmland is quickly becoming young forest. Because there are several bird species that need a young even-aged forest structure to meet their nesting requirements, it is an important habitat type to retain when possible.

The early succession nature of this stand could be retained through periodic mechanized harvesting, or, although it's much more demanding, manual cutting. With the manual approach, the tallest trees could be marked and felled on a regular basis. A mechanized harvest would leave only small shrubs, which could then be maintained through periodic brush-hogging.

There are few snags and coarse woody debris is low in this unit, but that is to be expected in a regenerating stand such as this. Creating some snags from larger trees at the edge of this unit will provide nesting opportunities for birds like the northern flicker that nest in tree cavities, but feed in early succession areas.



Figure j: Old field, unit 4

There are some apple and hawthorn trees scattered about. These trees provide food resources (fruit) for a variety of bird species, as well as other wildlife. Releasing apple and hawthorn trees will help them retain their place in the unit and continue to supply fruit. The honeysuckle also scattered about presents a problem. This invasive species spreads in open old-field conditions, choking out native plants. The honeysuckle fruit, while appearing to be a good food source for birds, actually supplies a high sugar-low fat “junk food” rather than the high fat foods many birds need to bulk up for long migrations. Retaining this unit in an early succession state may necessitate intensive honeysuckle control, requiring either regular manual removal or chemical treatment by a licensed herbicide applicator.

If management for early succession habitat is not feasible in this unit, attention should be paid to retaining a soft edge between the interior forest to the north and the open fields to the south. This means maintaining a gradual transition from no trees to mature trees. Soft edges reduce the infiltration of nest predators and parasites such as the brown-headed cowbird that prey on and significantly impact the reproductive success of interior nesting birds such as the wood thrush.

Management Recommendations:

- A management priority is to manually cut trees that are already too large to be brush-hogged (e.g. > 2 in. diameter).

- Wherever possible it is recommended to allow brushy conditions to develop and subsequently to maintain them over time. Implementing this recommendation can be achieved first by clearing larger trees, then by brushhogging each patch once every 10-15 years. If, for example, 4 patches were chosen, one patch would be cut every 3-4 years, starting the cycle again in 10-15 years. The objective is to allow woody vegetation (e.g. meadowsweet, small saplings) to establish itself, but not get too large that it cannot be cut with a brushhog. Cutting cycle may need to be adapted to achieve this objective. Patches ½ acre in size and larger will have the highest habitat value. ***It is noted that invasive honeysuckle is found in this vicinity. It should be removed and its presence monitored if this recommendation is followed. If honeysuckle spreads, consider discontinuing this practice or mounting an aggressive invasive removal campaign.***
- Standing snags and downed trees are of significant value to many species of wildlife. Dead or dying standing trees provide roosting, perching, foraging, and nesting sites for roughly 40 species of birds. Retain a minimum of six snags per acre, with one exceeding 18 in. dbh and three exceeding 16 in. dbh. Priority should be given to hardwood snags as they remain intact longer. Also retain some live trees of poor form and quality during harvests to serve as the next cohort of snags and CWD. If target number of snags does not exist, consider girdling poor quality trees in order to achieve abundance objectives. See Appendix D for more information on girdling. Due to the lack of large trees in this unit, snag focus may need to be at the edges with other units.
- Apple trees and/or hawthorn exist within this unit. These should be retained. The blossoms of apple trees serve as a food source for ruby-throated hummingbirds. Baltimore orioles, eastern bluebirds and other bird species nest in apple trees. Hawthorn trees produce a fruit eaten by a variety of birds and other wildlife. Apple trees and hawthorns that are crowded by competing vegetation should be “released” by removing any trees that overtop them as well as any vegetation within their drip-line (Appendix E).
- The negative edge effects of a hard edge can be reduced by feathering the edges. A feathered edge can be created by retaining more trees closer to the forest and gradually moving toward fewer trees closer to the open area. Given the landowner objectives to maintain the fields in an open condition, creating a soft edge by letting shrubby vegetation to grow out into the field is not recommended. One alternative is to create shrubby conditions on the forest side of the edge by aggressively thinning out mature trees approximately 15-20 ft. into the forest. A second alternative is to *girdle* some of the trees along the edge of the forest. Girdled trees will eventually die, creating another important habitat feature – snags. See Appendix D for more information on girdling. In time, shrubby growth will establish itself due to the open canopy that develops as the trees die. In either scenario, trees of poor form and quality should be chosen for removal or girdling. The resulting shrubby conditions make it more difficult for cowbirds to visually locate nests in the forest interior.
- Federal cost-share funds through the Wildlife Habitat Incentive Program (WHIP) may be available to help defray the costs associated with maintaining early-successional habitat (Appendix F).

Target Responsibility Bird Species

- 🐦 Chestnut-sided Warbler
- 🐦 White-throated Sparrow
- 🐦 American Woodcock

- 🐦 Northern Flicker
- 🐦 Ruffed Grouse
- 🐦 Nashville Warbler

5. Significant Wetlands & Buffers 6.5 acres

Area description:

This unit includes three significant wetland areas and buffers around them. Two of these wetlands are hemlock-hardwood swamp communities and a third is a large vernal pool (eastern-most area). For the purposes of this assessment, 100 foot buffers of the wetlands have been included as a part of the unit. The 2 swamps contain a mix of softwood and hardwood species, with a mostly open canopy. The vernal pool is a fantastic example of this unusual wetland type. There is another potential vernal pool just to the north of the one included in this habitat unit, but it was mostly dry at the assessment time suggesting it does not hold water long enough for successful amphibian breeding.



Figure k: Hemlock-hardwood swamp, Unit 5

Assessment of Current Conditions:



Figure l: Vernal pool- Unit 5

Within the wetland areas of this unit, the ground is considerably wetter than the surrounding forest and there is greater structural diversity, possibly due to more frequent wind-throw in the saturated soils. These areas are more likely to attract species such as the Canada Warbler that prefer wet shrubby habitats, and the woody debris, hummocks and leaf litter may make it particularly appealing to species such as the Wood Thrush and Veery.

Vernal pools are wetlands that hold water for only certain portions of the growing season, because of their ephemeral nature they do not support

fish populations, and are critical habitat for a number of amphibians, mollusks and invertebrates. Both spotted salamander and wood-frog eggs were noted in this pool, these are both species which breed in vernal pools, but live most of their life in the surrounding upland forest. Care should be taken in the area of the this vernal pool to protect not only the pool itself, but the upland “life zone” which can extend as much as 750 feet around vernal pools.

The wet soils, biological diversity and ecological sensitivity make these wetlands important resources to protect. Management activities within the wetlands should be avoided entirely, and activity within the buffer should be limited to only that which is absolutely necessary.

Management Recommendations:

- Maintain forested buffers around wetlands and vernal pools in which trees are not harvested or harvested very lightly, preferably when the ground is frozen. Some bird species, such as the Canada warbler and alder flycatcher, nest in vegetation and coarse woody debris in and around forested wetlands. Buffers greater than 200 ft. in width have the greatest value, although buffers as narrow as 50 ft. will provide baseline habitat needs for songbirds.
- Maintain a complete forest cover condition within 100 ft. of a vernal pool. Light thinning of forest trees is, in most cases, acceptable but should come no closer than 25ft. to the pool’s edge. Since many amphibians require a dense leaf litter on the forest floor with un-compacted soils, logging should occur when the soils are frozen and there is adequate snow cover. The creation of ruts in this area can often disrupt the hydrology of the nearby vernal poolⁱⁱ.
- If ground nesting bird species, such as ruffed grouse, are known to be nesting near a trail, consider temporarily closing the trail until the young have fledged – generally after the second week of July.

Target Responsibility Bird Species:

- ☞ Canada Warbler
- ☞ American Woodcock

- ☞ Ruffed Grouse
- ☞ Lincoln’s Sparrow

6. Mad River Riparian Zone – 13 acres

Area description:

This area of the property is located along the eastern shore of the Mad River, extending along the entire western edge of the parcel. The northern part of the unit is primarily forested flat land within the floodplain of the river. There is a narrow section of steep rocky land along the middle of the unit, with the southern end being either open field or old-field. The Mad River is a dominant feature in this unit and management recommendations presented here seek to enhance both habitat



Figure m: Floodplain Forest, Unit 6

qualities as well as water quality and streambank stability.

Assessment of Current Conditions:

The floodplain forest section of this unit is a fairly wide swath along the northern half of the parcel's western boundary. This is a sugar maple-ostrich fern forest, an unusual natural community to find intact. In this section, trees are generally pole sized with a few larger sawtimber sized trees mixed in. Snag numbers do not meet the recommended density, but will appear in their own in time. Coarse woody debris is moderate and vertical diversity is low.

The southern half of this unit includes a narrow steep rocky outcrop with hemlock and spruce dominating before dropping steeply to the rivers edge. At the far southern end is a mix of open field and brushy old-field conditions.



Figure n: Steep drop to Mad River, Unit 6

Japanese knotweed, an invasive species is present along the Mad River shore all along this unit, and honeysuckle is present in the south as noted in unit 4.

Because of the established presence of invasives that spread without a shading canopy, as well as the sensitivity of the riparian edge, this unit is best left as an unmanaged riparian buffer. Access is difficult to the floodplain forest in the north, limiting the workability of the area anyways. Some manual work could be conducted to add a couple of snags, but overall allowing the unit to naturally re-vegetate would probably be best.

Management Recommendations:

- No active management is required to provide habitat for the target species listed below. This is a unique ecological feature and as such warrants protection.

Target Responsibility Bird Species:

Brushy Old-field (southern end)

- 🐦 Chestnut-sided Warbler
- 🐦 White-throated Sparrow
- 🐦 American Woodcock
- 🐦 Nashville Warbler
- 🐦 Magnolia Warbler
- 🐦 Northern Flicker

Floodplain Forest (southern end)

- 🐦 Ovenbird
- 🐦 Yellow-bellied Sapsucker
- 🐦 Eastern Wood-Pewee
- 🐦 American Redstart
- 🐦 Black-throated Blue Warbler

Appendix List

- A. Map of Habitat Units
- B. Responsibility Bird List- Alphabetical
- C. Responsibility Bird List- by Habitat
- D. Girdling
- E. Apple Tree Release
- F. Federal and State Habitat Cost Share Programs

Endnotes:

ⁱ Arrowwood Environmental, 2007. Natural Heritage Inventory and Assessment for Waitsfield and Fayston, Vermont. Conducted for the Mad River Valley Planning District.

ⁱⁱ Adapted from Calhoun, A.J.K. and M.W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the Northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York