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Forest Bird Habitat Assessment

Boyce Hill Town Forest
Fayston, VT

95 GIS acres

Assessment Date:
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Report Date:
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Priority Forest Birds (left to right): Chestnut-sided Warbler, Ovenbird, White-throated Sparrow, Black-throated Blue Warbler

Background

Breeding bird surveys have shown that the forests of Vermont and Northern New England are globally important for birds throughout the hemisphere**. Our forests are home to the highest concentration of bird species breeding in the continental United States;** they are a "veritable breeding factory" for hundreds of neo-tropical migratory birds.

Unfortunately – even though they are still common in our area - **many of these birds are experiencing long-term population declines.** Audubon Vermont's Healthy Forests Initiative focuses its conservation efforts on 40 of these forest bird species, known as ***responsibility species***. These birds have a high proportion of their global populations breeding in our region, so we have the opportunity – and responsibility - to keep them common before they become rare, threatened, or endangered.

Even the smallest properties can be critical parts of large forest blocks that provide high-quality habitat for breeding birds. **Small actions by forest landowners can have a global impact.** Audubon Vermont is partnering with foresters and other stewardship and conservation organizations to provide **technical assistance to and educational opportunities for private landowners and municipalities** who want to make a difference for birds in their forests. Habitat assessments, management plan reviews, and implementation consultations are provided to qualifying landowners free of charge due to generous support from grant funding and individual donations.

Purpose

This assessment was conducted by an Audubon biologist in order to:

- Describe and assess current forest bird habitat conditions on the property.
- Make recommendations for protecting and improving habitat for a suite of priority forest birds.
    - Terminology and descriptions can be found beginning on page 13

Key Recommendations-

- Maintain 40-50 acres of the property in a young forest habitat condition over time.
- Promote the development of structurally complex mature forests across 32-42 acres of the property.
- Maintain approximately 13 acres in an open condition.
- Make a plan for monitoring and controlling non-native invasive plants on the property.
- Contact Audubon Vermont for follow up consultation on the implementation of any of our recommendations.

Birds and Habitat Types

We share our northern forests with as much as 90% of the global breeding populations of dozens of species of migratory birds, including the Bicknell's Thrush, Black-throated Blue Warbler, and Canada Warbler (Partners in Flight). The North American Bird Conservation Initiative refers to these birds as **responsibility species**; the responsibility of looking out for the future of these birds is in our hands because our forests are the core of their breeding range. Fortunately, because these birds are still common in our region, we have the opportunity to protect and enhance their breeding habitat now before they become rare, threatened, or endangered. Knowing who is or may be nesting on your property is a great way to ensure that you're making a positive difference.

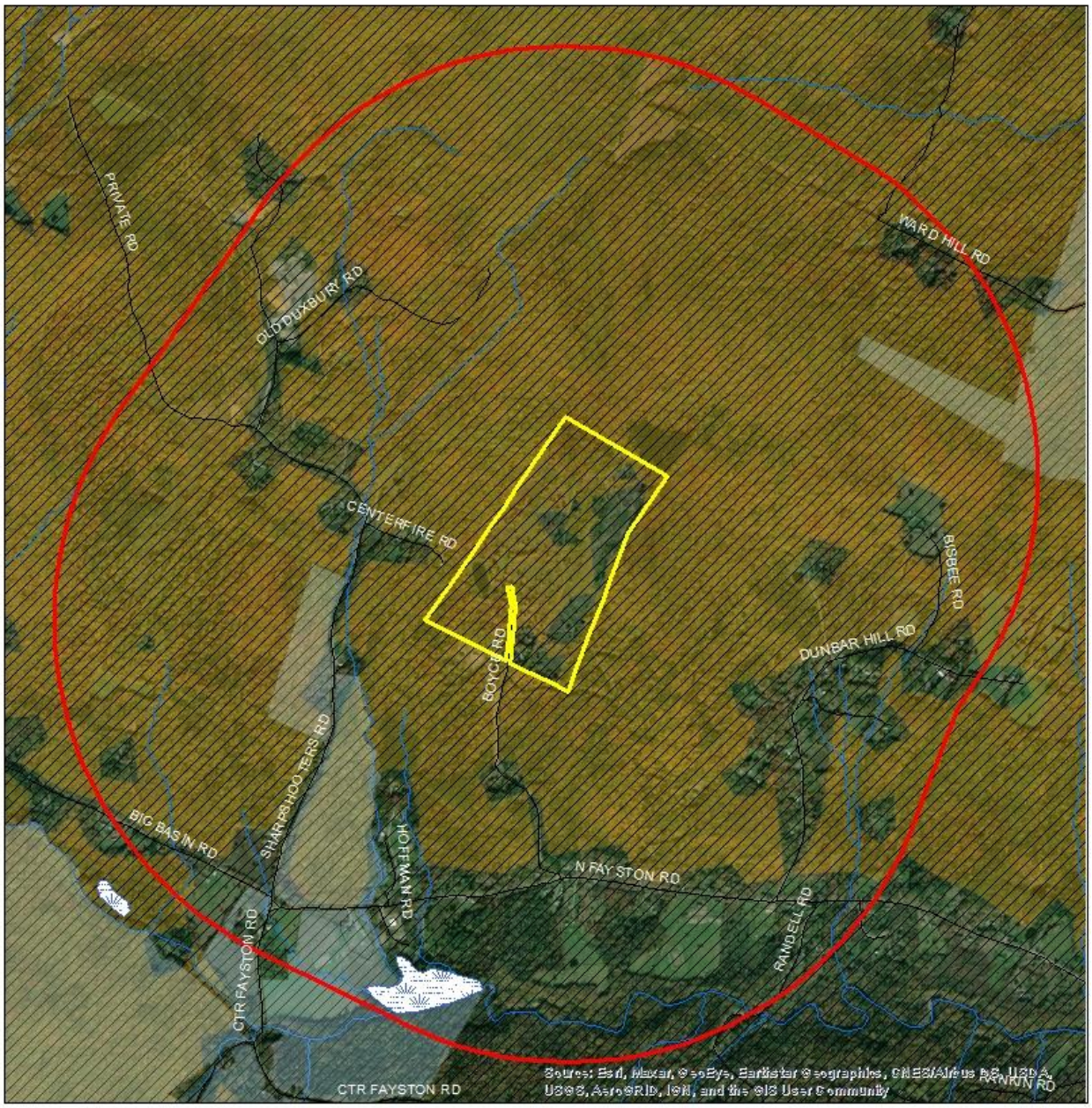
**Note: assessment was conducted outside of breeding season when detection opportunities are limited. A comprehensive bird list from May 2020 provides a better look at what species are using the property.*

Young Hardwood/Mixed Forest	**Confirmed**	**Potential**
American Woodcock*		x
Canada Warbler*		
Chestnut-sided Warbler*		x
Magnolia Warbler		x
Mourning Warbler		x
Nashville Warbler		x
Northern Flicker	x	
Ruffed Grouse		x
White-throated Sparrow*		x
Mature Hardwood/Mixed Forest	**Confirmed**	**Potential**
American Redstart		x
Blackburnian Warbler		x
Black-throated Blue Warbler*		x
Black-throated Green Warbler*		x
Blue-headed Vireo*		x
Chimney Swift		
Eastern Wood-pewee*		x
Northern Parula		x
Ovenbird		x
Purple Finch		x
Scarlet Tanager*		x
Veery*		x
Wood Thrush*		x
Yellow-bellied Sapsucker*		x

Boreal/High Elevation Forest	**Confirmed**	**Potential**
Bay-breasted Warbler		
Bicknell's Thrush		
Black-backed Woodpecker		
Blackpoll Warbler		
Boreal Chickadee		
Cape May Warbler		
Gray Jay		
Palm Warbler		
Spruce Grouse		
Tennessee Warbler		
Yellow-bellied Flycatcher		
Wetlands and Watercourses	**Confirmed**	**Potential**
Alder Flycatcher		
Lincoln's Sparrow		
Louisiana Waterthrush		
Olive-sided Flycatcher		
Rusty Blackbird		
Swamp Sparrow		
Other birds observed		
Red-eyed Vireo		

** Birder's Dozen* species: Hundreds of species of birds breed in Vermont every year. Identifying all of them by sight and sound is a daunting task, even for expert birders. A simpler starting and focal point for those interested in managing forests with birds in mind is Audubon Vermont's *Birder's Dozen*, which are relatively easy to identify by sight and sound and use a variety of habitat types.

Landscape Context Map



Legend

- 2,500 Acre Landscape
- Boyce Hill TF
- Stream/River
- Wetland
- VLT Conserved Land
- Audubon Priority Forest Block
- Highest Priority Interior Forest Block
- Road

N

0 0.125 0.25 0.5 0.75 1 Miles

Land Planning

Having a clear and informed plan for the future of your forest is one of the most important things you can do to protect habitat for birds and other wildlife in your woods.

	Yes	No	Interested	Comments
Forester	X			Currently Caitlin Cusack, VLT
Enrolled in Current Use Program		X		NA
Management Plan	X			Interim plan in place; longer-term plan in development
Enrolled in NRCS		X		NA
Conservation Easement	X			VT Land Trust
Tree Farm		X		

Landscape Context - see map previous page

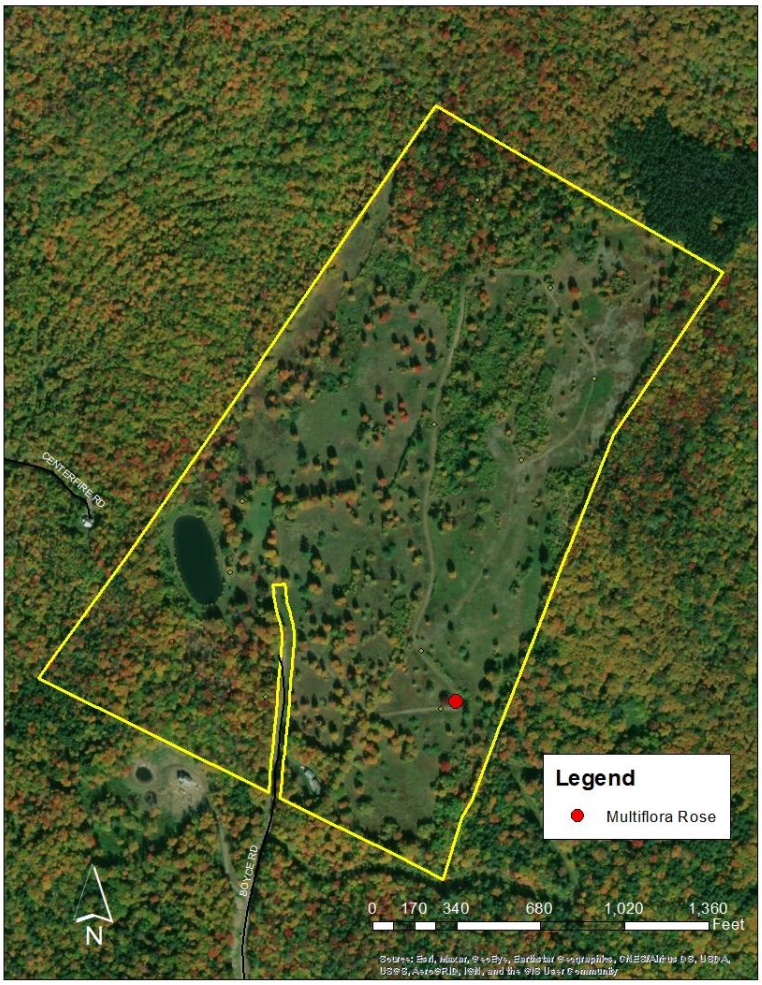
The composition and structure of the landscape that immediately includes and surrounds your property affects how wildlife will use the property and the quality of the habitat they find there. Heavily forested landscapes with large, connected blocks of mature forest that include some very young and very old forest have the full suite of forest responsibility birds.

Feature	Value for forest birds			Comments
	High	Good	Low	
% Forest Cover within surrounding 2500 acres	>70% of area	50-70% of area	<50% of area	
Forest Block Size	>2500 acres	500-2500 acres	<500 acres	Part of the 355,623 acre Battell Priority Forest Bird Block as delineated by the National Audubon Society and part of a 54,972 acre Highest Priority Interior Forest Block as delineated by the VT Agency of Natural Resources.
% Mature Forest >20 years (with some old forest >100 years)	>90% of forest		<90% forest	Highly supportive of bird species which nest in older, closed and intermediate canopy forests
% Young Forest <20 years	3-5% of forest		<3% or >10% forest	Based on analysis of aerial imagery and on-ground reconnaissance, the Boyce Hill TF appears to provide the only significant young forest in the landscape.

Plant Diversity

Forest birds rely on a diversity of native plants for food, cover, and as nest sites. Maintaining a variety of native plants and controlling non-native, invasive plants benefits birds in your woods.

Feature	Condition			Comments
	Good	Fair	Needs Work	
Native plant diversity	High	Moderate	Low	
Non-native plant infestation	None	Low	Moderate to severe	A single occurrence of multiflora rose was noted in the southeast corner of the parcel, along the road to the top of the hill. See map below for specific location.
Soft mast native fruits and berries	Abundant	Some	Absent	Blackberry, choke cherry, apple



Mature Forest Structure – 17 acres – 18% of parcel

Well-developed forest structure can be a signature of a healthy forest and key to supporting a wide diversity of living things in your woods. It's not mess; it's structure!

Feature	Condition			Comments
	Good	Fair	Needs Work	
Understory	High density	Moderate density	Little to none	
Midstory	High density	Moderate density	Low density	
Canopy gaps	Present		Absent	
Leaf litter	Present		Absent	
Snags and cavity trees	Many	Some	Few or none	Smaller diameter (<10") snags in highest abundance although lower in habitat value.
Downed dead wood	Many	Some	Few or none	Coarse woody material better represented than fine woody material.

Young Forest Structure – 65 acres – 68% of parcel

Regenerating forests comprised of high-densities of seedling, saplings, and shrubs is an important habitat component of the landscape. These areas are often referred to as "early-successional" habitat.

Feature	Condition			Comments
	Good	Fair	Needs Work	
Understory	High density	Moderate density	Little to none	Variable across entire habitat unit based on site conditions and time since last management
Midstory	High density	Moderate density	Little to none	Variable across entire habitat unit based on site conditions and time since last management
Patch size(s)	>1 acre		<1 acre	
Snags and cavity trees	Many	Some	Few or none	
Downed dead wood	Many	Some	Few or none	
Overstory tree retention	Many	Some	Few or none	

Other Habitats

These habitats add diversity and habitat value for birds within forested landscapes.

Feature	Present	Absent	Comments
Streams	**X**		Small perennial stream along western boundary
Forested Wetlands		**X**	
Other Wetlands		**X**	No wetland natural communities although man-made pond provides aquatic habitat
Meadows	**X**		Area just east of pond provides a more open condition dominated by grasses and forbs
Hayfields		**X**	

Notes, Considerations, and Recommendations

- The Boyce Hill Town Forest property offers a diversity of habitat conditions including **mature forest, young forest,** and **open land**. The overall recommendation is to manage the property in ways that maintain the diversity of habitat conditions, although at different relative proportions than currently exist.

- The **mature forest habitat** provides suitable nesting habitat for many associated priority bird species. **Vertical structure**, **snags and cavity trees,** and **downed deadwood** are all sufficiently represented particularly given the relatively small acreage of this habitat type. Based upon this acreage no active forest management is deemed necessary at this time. Natural processes can be used to continue to drive future structural enhancement.

1. **Young forest habitat** is the predominant condition on the property, the result of years of maintaining the land in an open condition and now, based on a reduction in management to keep it open, reversion back to forest. Although this assessment was conducted outside of the breeding season, and therefore bird activity was quiet, it is presumed that a full suite of young forest nesting birds, such as Chestnut-sided Warbler, Mourning Warbler, White-throated Sparrow, and others find suitable breeding habitat here. eBird data from spring 2020 supports this. Young forest is an ephemeral habitat condition and typically matures out of suitable structure within 15-20 years. On the Boyce Hill Town Forest, the age of the young forest is estimated to range from 3-15 years. Some areas have matured to the point of nearly moving out of providing suitable young forest conditions while others are still in the early stages of suitability. Ensuring that this important habitat type remains represented on the parcel can be

achieved by "resetting the successional clock" through brushhogging and/or cutting of trees. Currently young forest habitat comprises approximately 68% of the parcel and 3% of the 2,500 acre landscape surrounding the parcel. While the landscape composition percentage is in alignment with desirable conditions the recommendation is to over time reduce the amount of young forest on the Boyce Hill Town Forest to 40-50 acres or 1.6 – 2% of the greater landscape, while focusing on growing more mature forests. There are 3 main reasons for this recommendation:

1. Increased frequency of intense weather events resulting from a changing climate is likely to naturally create additional areas of young forest in the landscape. Relying upon management to create/maintain these conditions has the potential to result in an over-abundance of young forest in the landscape.
2. Climate change has been identified by the National Audubon Society as one of the greatest influences to birds populations over the course of the century. Climate mitigation efforts (carbon sequestration and storage) are among the natural solutions for responding to the climate crisis. Mature forests have greater capacity to sequester (as trees grow) and subsequently store carbon.
3. The Fayston Conservation Commission will likely need to balance many different, and sometimes competing interests, on the Boyce Hill Town Forest. A more balanced allocation of habitat types and conditions across the parcel will more likely accommodate these varied interests.

While specific areas of the property were not identified as a focus for maintaining young forest habitat, the most likely areas to start with would be those that promote the incredible view scape.

- To the extent possible conduct any harvesting of trees or brushhogging outside of the bird breeding season which runs from May – mid-July. Late summer through winter management is preferable, as it will not result in direct impacts to nesting birds.

- **Non-native invasive plants** are a resource concern on any property. A single occurrence of multi-flora rose was identified during the 2020 assessment (see map on page 6). Non-native invasive plants often flourish in open canopy and recently disturbed areas making it somewhat surprising that there are not more occurrences on the property. Early detection and rapid response is a critical component of invasive plant species management and a plan to develop an invasives management plan is highly recommended. An excellent online resource for learning more about the plants and control methods can be found at https://vtinvasives.org

- There is an approximately 17 acre area to the north and east of the pond that is in a more open condition, dominated by herbaceous plants such as grasses and other forbs, milkweed,

goldenrod, etc. Areas such as this are important for birds like Ruffed Grouse and Wild Turkey to bring their young to forage on insects. They also have the capacity to support native pollinating insects. In the early spring American Woodcock may partake in their courtship rituals here. It is recommended to maintain this area in an open condition through brushhogging on a biennial basis, in the late fall.

Climate Change and Birds

A newly released report by the National Audubon Society, "Survival by Degrees: 389 Bird Species on the Brink" has identified climate change as THE greatest challenges to bird conservation. Modeled climate change impacts to the forests of Vermont will alter nesting habitat conditions for priority bird species. This in turn is likely to result in changes to the bird species community, their nesting success, and overall incidence of birds that are currently characteristic of the region.

Of the 604 North American bird species Audubon assessed, nearly 2/3 (389 species) are vulnerable to extinction under 3°C of warming. In Vermont 94 of 168 bird species assessed are vulnerable in summer under the 3°C scenario. Reducing emissions to 1.5°C reduces the number of vulnerable species to 54. For a more detailed description of how climate change will impact birds in Washington Co., VT using Audubon's Birds and Climate Visualizer click here.

Forest management activities that enhance songbird habitat also have the potential to provide climate-related co-benefits of mitigation (carbon storage) and adaptation (ecosystem resiliency). Co-benefits as they relate to management recommendations for the Boyce Hill Town Forest include:

Attribute	*Habitat Benefit*	*Mitigation Benefit*	*Adaptation Benefit*
Structural Retention	Structures such as large trees, down woody material, brush piles, and snags provide nest sites and foraging opportunities	Enhanced net carbon storage compared to silvicultural systems that do not emphasize structural retention	Superior wildlife habitat including refuges from extreme conditions and soil moisture retention which aids germination
Multi-aged, mixed-species forest with a shade-tolerant component	Layered canopy provides nesting and foraging sites for maximum number of species	Higher net carbon storage associated with multi-aged forests. High biomass enables higher sequestration rates.	Plant species diversity buffers against loss of species and impacts of pests and pathogens and creates redundancy in ecosystem functions.
Maintain a generally closed canopy	Mature forest birds such as Black-throated Green Warbler, Blue-headed Vireo, and Scarlet Tanager benefit	Cool temperatures on the forest floor moderate decomposition rates, slowing loss of carbon store compared to open-canopy sites where decomposition is more rapid	Cooler, shady forest offers refuge for invertebrates in warmer temperatures

Maintain moist leaf litter layer	Litter nesting (Ovenbird) and foraging (Wood Thrush) birds benefit	Leaf litter can contribute to soil organic carbon storage	Moist leaf litter offers refuge for invertebrates in warmer temperatures
Control invasive species	Remove low-value food source and potential "sink" habitat nesting site		When forest understory is dominated by non-native plants native trees and shrubs have a more difficult time becoming established and overall forest complexity is diminished
Protect and promote intact, connected forest landscapes	Higher reproductive success rates for interior forest birds	Carbon is stored in forests more so than other land uses	Landscape permeability allows for species movement and gene flow as conditions change

Representative Photos from the Boyce Hill Town Forest

Common mature forest habitat conditions

Common mature forest habitat conditions

Developing young forest conditions dominated by aspen

Young forest with standing snags

Single occurrence of multi-flora rose

Open area where Ruffed Grouse feather was found

The view

Terms and Explanations

Big Trees: Live trees great than 19 – 24 inches diameter at breast height (DBH).

Importance for Forest Birds: Big trees are a key characteristic of old forests and high-quality mature forest habitat for songbirds. Researchers in Wisconsin found priority birds were more abundant and successful in forests with >10% of the live basal area in big trees (19+ inches DBH) than in forests with fewer big trees (Managed old-growth silvicultural study (MOSS), Wisconsin Department of Natural Resources, 2013). Structurally-sound, large-diameter trees are important stick nest sites for woodland raptors, such as the northern goshawk. If retained as legacies, these large trees also provide cavity nest sites for large woodland birds including owls and pileated woodpeckers.

Canopy Gap: A small opening in the upper canopy of a mature forest typically the size of one tree crown up to 1/4 acre.

Importance for Forest Birds: Birds such as the eastern wood-peewee forage in canopy gaps, which also allow sunlight to reach the forest floor through the upper canopy stimulating new growth in understory and midstory. Gaps created where trees fall or blow over or are cut down are a normal and important part of a healthy forest and high-quality mature forest habitat.

Downed Deadwood: Coarse woody material (CWM) is downed logs and branches >4 inches diameter. Fine woody material (FWM) is limbs and branches <4 inches diameter including slash.

Importance for Forest Birds: CWM provides perch sites for singing (e.g. by ovenbird) and other male courtship displays, and provides habitat for the insects and other arthropods that are a significant part of the breeding season diet of many birds. Ruffed grouse tend to use CWM >8 inches diameter as drumming perches. When aggregated in piles (e.g tree tops or slash piles) FWM offers a nesting substrate and cover for white-throated sparrows and veeries. Scattered individual pieces have minimal habitat value.

Forest Block: A large area of contiguous forest cover

Importance for Forest Birds: Very large (>2500 acres) blocks of contiguous forest provide the highest quality habitat for interior-nesting birds like wood thrush that reproduce more successfully away from edges and development. Large blocks also likely contain the full range of habitat types and conditions required to support most or the entire suite of responsibility birds. Smaller forest patches >500 acres in size provide important habitat in more fragmented landscapes and can connect larger patches. Patches <500 acres in size can still support breeding birds in heavily forested landscapes and area important habitat during the migration season.

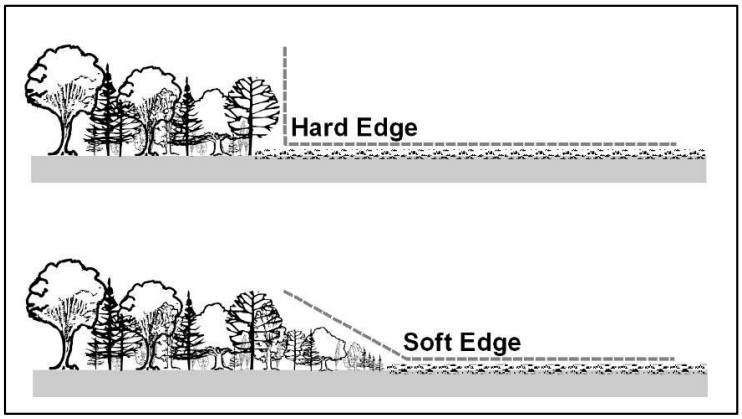
Forest Cover: Area of land that is forested or wooded.

Importance for Forest Birds: Heavily forested landscapes (70+% forest cover) provide the greatest quantity, diversity, and quality of habitat for responsibility birds compared to fragmented and/or developed landscapes with lower forest cover.

Forest Edge: The boundary between forest and open land, such as a field or backyard.

Importance for Forest Birds: The transition from low herbaceous vegetation to tree canopy can be considered either a “soft” or “hard” edge. A soft edge is a gradual change in vegetation height moving into the forest. This gradual transition is important for buffering interior forest specialists like the wood thrush from the incursions of nest predators (such as raccoons and skunks) and nest parasites (such as the brown-headed cowbird) that are frequently found in open and developed areas. A gradually

increasing canopy height helps to shield interior-nesting birds from view by predators and parasites. Additionally, the brushy conditions that often develop in a soft edge may provide breeding habitat for young forest habitat bird species including chestnut-sided warbler and white-throated sparrow.



Fragmented Forest: Forest that is broken into small, unconnected patches primarily due to some form of development (e.g. residential, commercial, or major roads).

Importance for Forest Birds: A fragmented forested landscape is more likely to support "generalist" wildlife species, such as raccoons and skunks, which can decrease nesting success of interior-nesting forest birds.

Hardwood Forest: A forest dominated by broad-leaved trees which lose their leaves in the fall.

Importance for Forest Birds: Some breeding birds are associated with hardwood forests, such as chestnut-sided warbler, eastern wood-pewee, and scarlet tanager.

Horizontal Structure: The arrangement of different habitat types across the landscape.

Importance for Forest Birds: A landscape with mature and young forest habitats, open fields, and wetlands would be rich in horizontal diversity. Landscapes with greater horizontal diversity support a greater diversity of breeding forest birds and other wildlife.

Interior Forest: Forest condition that occurs with increasing distance from a forest edge.

Importance for Forest Birds: As perceived from a bird's perspective, interior forest conditions begin to occur approximately 200-300 feet from a forest edge. At this distance, negative edge-associated effects such as nest predation and parasitism generally no longer occur. Interior-nesting species, such as scarlet tanager, wood thrush, ovenbird, black-throated blue warbler, and blue-headed vireo, have greater reproductive success when they nest away from forest edges.

Invasive (non-native) Plant: A plant that is able to establish on many sites, grow quickly, and spread to the point of disrupting native ecosystems. Often non-native.

Importance for Forest Birds: Non-native, invasive plants, such as bush honeysuckles, buckthorn, and Japanese barberry, present a variety of threats to forest health in Vermont and the northeast. Although some species of native forest birds successfully use these shrubby, woody plant species as nesting sites and eat their fruits, the fruits generally have low nutritional value and the invasive plants reduce the diversity of other nesting and foraging options in forest ecosystems. Overall, non-native, invasive plant species degrade the quality of native forest bird habitat in our region.

Leaf Litter: Dead plant material such as leaves, bark, and twigs that has fallen to the ground.

Importance for Forest Birds: An abundant layer of moist leaf litter is home to an array of insects, mites, and spiders. These arthropods make up a significant component of ovenbird, veery, and wood thrush diets during the breeding season. Ovenbirds also rely upon a deep layer of deciduous litter for constructing their ground nests, and nest site selection is strongly associated with this habitat variable.

Mature Forest Habitat: Forest with a canopy greater than 20 feet tall.

Importance for Forest Birds: Many responsibility birds breed in mature forest habitats where they find nest sites, cover, and food. Typically, the quality of mature forest habitat increases for forest birds as a forest ages and structure diversifies. Pole stands – the youngest type of mature forest habitat - are typically structurally simple and attract a small suite for forest birds including ruffed grouse and American redstart. Older stands with understory and midstory layers, canopy gaps, large trees, snags, and logs, attract a much greater diversity of birds including black-throated blue warbler, wood thrush, Canada warbler, and black-throated green warbler.

Midstory: Live, woody vegetation in the 6-30 foot height range including trees and shrubs.

Importance for Forest Birds: High stem and foliage densities of woody plants in this forest layer provide nest sites, foraging substrates, and protective cover for many forest birds. Stand-wide coverage is desirable but not necessary; well distributed patches are sufficient. The majority of responsibility bird species nest and/or forage within the first 30 feet of the forest. Nests of wood thrush, American redstart, black-throated green warbler, and blue-headed vireo are most commonly found in the midstory level.

Mixed Forest: A forest made up of hardwood and 25-75% softwood tree species.

Importance for Forest Birds: Some breeding birds are associated with mixed forests, such as black-throated blue warbler, Canada warbler, and white-throated sparrow.

Snags and Cavity Trees: Snags are standing dead or partially dead trees that are relatively stable. Cavity trees may be alive or dead.

Importance for Forest Birds: Snags provide opportunities for nesting cavity excavation by yellow-bellied sapsuckers and northern flickers, and existing cavity trees provide potential nesting cavities for chimney swifts. Aspen and birch species are frequently chosen as trees to excavate. Cavities are often made in trees with the heartwood and sapwood decay fungi. Suggested targets for snags and cavity trees combined in are ≥ 6 per acre, with one tree >18 inches DBH and 3 >12 inches DBH. Branches on snags may be used as foraging perches and nest sites.

Soft Mast: Soft fruits and berries.

Importance for Forest Birds: Fruits including cherry, apple, *rubus* species (e.g. blackberry and raspberry), dogwood, and others are important food sources for forest birds. In the late summer and early fall, after fledging and before migrating, many birds feed on these fruits and the insects that are attracted to them in order to build up critical fat reserves needed to endure long fall migrations.

Softwood Forest: A forest dominated by coniferous trees, usually "evergreen" (the exception being tamarack), with needles or scale-like leaves.

Importance for Forest Birds: Some breeding birds are associated with softwood forests, such as magnolia warbler and blue-headed vireo. Other birds, such as blackburnian and black-throated green warbler, are associated with small clusters of softwood trees called exclusions in hardwood stands. For this reason, maintaining or increasing the softwood component of hardwood stands increases their overall habitat value. Several responsibility species are associated with softwood forests that are dominated by spruce and fir. Bicknell's thrush is associated with these forests found at high-elevations in the mountains, and species including boreal chickadee, spruce grouse, and black-backed woodpecker, are associated with lowland spruce-fir forests in the northern parts of our region that are characterized by a short growing season and cold climate.

Understory: Live vegetation in the 1-5 foot height range, including tree seedlings and saplings, shrubs, and herbaceous vegetation.

Importance for Forest Birds: High stem and foliage densities of woody plants in the understory provide nest sites, foraging substrates, and protective cover for many forest birds. Stand-wide coverage is desirable but not necessary; well distributed patches are sufficient. Herbaceous plants may also be used by songbirds for foraging and nesting, but generally less so than woody plants. Species in this layer frequently used by birds include sugar maple, American beech, hobblebush, red spruce, *rubus* species, and striped maple. Black-throated blue warbler and wood thrush place nests in this layer, and Canada warbler and veery tend to nest on or near the ground, concealed by dense understory growth. The best breeding habitats for mourning warbler and chestnut-sided warbler are patches of dense, low growth with <30% overstory cover in patches >1 acre in size (young forest habitat conditions).

Vertical Structure: The complexity of vegetation and other structures as they are vertically arranged in the forest.

Importance for Forest Birds: A forest with a well-developed understory, midstory, and canopy exhibits complex or diverse vertical structure, which offers habitat for a greater array of bird species compared with a structurally simple forest. Non-living features, such as coarse woody material and the microtopography of the forest floor, add to the complexity of vertical structure as well.

Young Forest Habitat: Forest patches greater than one acre in size dominated by a high density of seedlings, saplings, and shrubs less than 20 feet tall.

Importance for Forest Birds: Several responsibility birds and many other wildlife species use young forests during all or part of their life cycle. Chestnut-sided warbler, American woodcock, and magnolia warbler all use young forests during the breeding season. Although these species may be found in patches smaller than one acre in size, research has shown that abundance and nesting success is greater in larger patches. Young forest habitats include regenerating patchcuts, clearcuts, and old fields. Early-successional young forest habitats dominated by intolerant species such as aspen and paper birch are particularly valuable for woodcock and grouse. Shrublands that will never mature into forest, such as those associated with beaver wetland complexes, can also attract species associated with young forest habitats since they have a similar vegetative structure. Recent research has also shown the importance of young forest habitats as post-breeding habitat for birds that nest in mature forest, such as scarlet

tanager and wood thrush. Young forest provides dense, protective cover for juveniles, as well as abundant sources of soft mast, which are important pre-migration food sources. Young forest habitats are ephemeral; they generally only persist 10-15 years where forest regenerates after a patch or clearcut and slightly longer on old field sites. Due to natural forest succession and development, the amount of this habitat type is decreasing in our region, which is a threat to the species associated with it.