

# **THE BREEDING BIRDS OF TEAL FARM**

**Huntington, Vermont  
Spring 2005**



**Prepared for  
Foundation for a Sustainable Future**

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**March 20, 2006**



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## Cover Photo:

Rose-breasted Grosbeak (*Pheucticus ludovicianus*), among the regular suite of breeding species in the hardwood forests of Teal Farm.

Photograph by Bryan Pfeiffer

## 1.0 Introduction

Wings Environmental was retained by the Foundation for a Sustainable Future (FSF) to conduct a field inventory of breeding birds at Teal Farm in Huntington, Vermont, during the spring of 2005. The study's principal objectives include:

- ◆ Obtaining a general baseline knowledge, through simple field investigations, of birds breeding at Teal Farm.
- ◆ Locating rare, threatened or endangered bird species on Teal Farm.
- ◆ Issuing preliminary land-use and conservation recommendations based on the long-term biointegrity of Teal Farm.
- ◆ Coordinating survey activities with other investigators (e.g. botanists, zoologists, entomologists etc.) working at Teal Farm.

## 2.0 Methodology

Traditional methods of documenting breeding in bird species is a time-consuming endeavor. It involves lengthy field investigations for evidence of breeding – such as nest-building, copulation, or the presence of fledglings – for each bird species encountered. This approach was beyond the scope of this project. However, a reliable and cost-effective alternative involves a rapid field assessment. This strategy was employed at Teal Farm.

The rapid field assessment involves a skilled individual's investigation of representative natural communities during the peak of breeding activity – the month of June in Huntington. Early-morning field visits were conducted in order to observe and overhear birds. During this period of high breeding activity, a bird observed or heard vocalizing *within its proper habitat* (with certain exceptions) can reasonably be assumed to be breeding in that location.

The rapid field assessment consisted of three phases: (1) landscape analysis; (2) field investigations; and (3) the securing of additional sources of breeding bird data. They are summarized below:

### 2.1 Landscape Analysis

A landscape-level review of Teal Farm preceded field investigations. This review, largely via geographic information system (GIS) analysis, was performed in consultation with Marc Lapin of Ecosystem Science and Conservation in Cornwall, Vermont, the principal investigator for the natural community assessment and mapping at Teal Farm. Also consulted during this phase were Nuna Teal, Melissa Hoffman and Amy Seidel of FSF. The following digital and hard-copy resources were employed during the landscape analysis:

- ◆ Digital Orthophotography
- ◆ U.S. Geological Survey topographic maps (1:24,000)
- ◆ Natural community maps prepared by Ecosystem Science and Conservation
- ◆ Stream maps (GIS layer)

Also preceding formal field investigations was a brief site visit to Teal Farm on 25 April 2005.

## 2.2 Field Site Selection and Survey Methods

Field investigations were designed to survey representative natural communities and habitats at Teal Farm for breeding birds. These were principally:

### Forest Communities:

- ◆ Northern Hardwood Forests
- ◆ Hemlock-Northern Hardwood Forest
- ◆ Montane Spruce-Fir Forest
- ◆ Montane Yellow Birch-Red Spruce Forest

### Other Habitats:

- ◆ Mesic, regenerating forest
- ◆ Forest edge
- ◆ Cultivated agricultural land and uncultivated forest openings
- ◆ Pond sites

Sixteen distinct sites were visited between 1 June 2005 and 16 June 2005. Each visit comprised a concerted effort to ascertain all bird species present in a selected natural community or habitat. Field investigations began at or before dawn (typically between 0500 hours and 0530 hours) and lasted until no later than 0820 hours. Additionally, numerous casual encounters with various bird species occurred between site visits.

Field technique involved walking properties and noting each and every bird species observed or heard vocalizing. The field investigator — Bryan Pfeiffer, founder of Wings Environmental — regularly vocalized (“spishing” and imitating the call of an Eastern Screech Owl) in order to elicit activity or vocalization from more secretive bird species.

## 2.3 Other Data Sources

Additional sources of data on bird diversity at Teal Farm included consultations with other birdwatchers and results from the Vermont Breeding Bird Atlas project (Laughlin 1985).

Finally, it should be pointed out that Paul Goodhouse offered Wings Environmental valuable insight into the property and its avifauna, including his experience with certain bird species not encountered during this investigation.

## 3.0 Study Sites

In order to maximize the efficiency of this investigation, and to obtain a reliable baseline inventory of breeding bird species, Wings Environmental surveyed dominant and representative natural communities at Teal Farm. These included the following:

<b>Community/Habitat Type</b>	<b>Polygons*</b>	<b>Description</b>
Wet Mesic Regenerating Woods	3	Medium-young regenerating mixed forest
Northern Hardwood Forest	8, 16, 42, 45	Dominant forest type at Teal Farm
Hemlock-Northern Hardwood Forest	13, 46	Small, limited
Montane Yellow Birch-Red Spruce Forest	27, 29, 31	Higher elevation mixed woods; marginal size
Montane Spruce-Fir Forest	28	Higher elevation; marginal size
Meadow/Field	12, 17	Mowed and overgrown farm fields
Hayfield	58, 61	In active cultivation
Willow Graminoid Swamp	34	Small wetland south of the southern farm pond
Farmstead	61-65	Openings near homestead farm pond

\* GIS map prepared by Marc Lapin of Ecosystem Science and Conservation

## 4.0 Summary Discussion of Teal Farm’s Bird Diversity

In general, the habitats and defined natural communities of Teal Farm are not of a composition or extent to serve as critical breeding areas for state or federally listed threatened or endangered bird species. None was encountered during field investigations. Overall, Teal Farm represents a standard mix of openings, successional areas and forest types typical of a large, Vermont working landscape. Accordingly, the property exhibits a mix of migrating and nesting bird species to be expected in these largely or somewhat disturbed and fragmented communities and habitats. Nevertheless, certain notable bird species – termed “priority species” – were discovered during field investigations.

The field investigation component of this study (plus accounts from other observers) revealed a total of 68 species at Teal Farm, the vast majority of which most likely breed at Teal Farm. These range from introduced species such as European Starling (*Sternus vulgaris*) to common and widespread species such as Song Sparrow (*Melospiza melodia*) to uncommon or declining species such as Wood Thrush (*Hylocichla mustelina*) and Canada Warbler (*Wilsonia canadensis*). An additional 16 species are expected to be breeding within Teal Farm properties but were not encountered during field investigations. Details on these species are presented in the next section.

## 5.0 Birds of Teal Farm

Birds are creatures of habit – and of habitat. During the breeding season they tend to occupy predictable places. Great Blue Herons, because they feed largely on fish and amphibians, are found in or near wetlands, for example. Eastern Meadowlarks, as the name implies, are indeed birds of the open country, never to be found nesting in woods. Indeed, woods are the preferred habitat of the Wood Thrush.

But most bird species, unlike other wildlife found at Teal Farm (with the notable exception of Monarchs and bats), are long-distance migrants. Some species inhabit and breed at Teal Farm from spring through fall. Others remain in their habitats year-round. And still others only stop at Teal Farm, mostly to rest and feed along their migratory routes. It should be pointed out that field surveys during spring and fall migration would reveal that many other species most likely pass through Teal Farm.

This study’s emphasis is on breeding birds – those strongly connected to the ecology of Teal Farm and therefore more sensitive to forces shaping and affecting the landscape on the property. But there may be another reason to focus attention on breeding birds: the vernal synthesis of color, flight and song found in the lives of breeding birds is, for human residents of and visitors to Teal Farm, among the most evident and cherished signs of nature. Depending on the conservation and land-use goals of the Foundation for a Sustainable Future, human interactions with birds may figure to a degree in conservation planning.

The field investigations for this study comprised first and foremost a rapid inventory of birds likely to be breeding at Teal Farm. As stated earlier, the assessment involves a skilled individual’s investigation of representative natural communities during the peak of breeding activity – normally the month of June in Huntington. During this period of high breeding activity, a bird observed or heard vocalizing *within its proper habitat* (with certain exceptions) can reasonably be assumed to be breeding in that location. Accordingly, the fieldwork established three levels of certainty of breeding:

- ◆ **Confirmed Breeder** – Species exhibiting obvious and conclusive evidence of breeding activity, i.e. nest-building, copulation, distraction displays or adults with young.
- ◆ **Probable Breeder** – Species encountered in viable habitat during the field investigations demonstrating some (yet not incontrovertible) evidence of breeding. This category comprises the bulk of this study’s evidence, and birds listed in the following tables are considered probable breeders unless otherwise noted.
- ◆ **Possible Breeder** – Species known to be associated with habitat existing at Teal Farm but not encountered directly during field investigations. These species may or may not breed at Teal Farm.

The results from this investigation begin with a few bird lists<sup>1</sup>:

- ◆ **Bird Species Encountered During Field Investigations** (Table 1) — This is simply a list of the 68 bird species Wings Environmental encountered during field work. Sixty-seven of these species can be assumed to be confirmed, probable or possible breeders at Teal Farm.
- ◆ **Additional Bird Species Expected to Breed at Teal Farm** (Table 2) — Certain bird species typically elude detection during a rapid field assessment of this nature. Because most of the field work in this investigation was conducted around dawn, certain owls (nocturnal) and hawks and falcons (active later in the morning and afternoon) were as a result largely undetected. Accordingly, this table lists an additional 16 species not encountered during field investigations, but that are either probable or possible breeders at Teal Farm (based on habitat analysis and personal communications with other investigators).
- ◆ **Priority Bird Species** (Table 3) — This table includes 12 species encountered at Teal Farm that are conservation priorities. These species are designated by Partners in Flight (Rich 2004), an international and well-regarded conservation organization, as “Watch List Species” or “Stewardship Species” in either the Northern Forest Avifaunal Biome or the Eastern Avifaunal Biome.

**Watch List Species** can be exceedingly rare and in need of immediate conservation intervention. They can also be moderately abundant or widespread but at the same time facing declines in population or other significant threats (such as loss of breeding or wintering habitat). This is the case with Teal Farm’s two Watch List species, Wood Thrush (*Hylocichla mustelina*) and Canada Warbler (*Wilsonia canadensis*). On a continental scale, these two species exist in relatively high numbers and with a fairly broad range; nonetheless, these species face significant threats and require focused management in order to increase and stabilize their continental populations. As a result, these two species may figure into future conservation planning at Teal Farm.

**Stewardship Species** deserve attention not because they face any immediate threat but rather that they represent an important suite of species in a particular biome. Most stewardship Species have stable or unknown population trends and tend to be broadly distributed across the continent during the breeding season. For the very reason they represent a particular biome, sometimes in large numbers, Stewardship Species warrant conservation attention in the broad context of conservation of a particular habitat or larger biome. Ten Stewardship Species inhabit Teal Farm, representing the Northern Forest Avifaunal Biome and the Eastern Avifaunal Biome.

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<sup>1</sup>Birds in these species lists are in phylogenetic order according to the American Ornithologists’ Union Checklist of North American Birds, Seventh Edition, which is the official source on the taxonomy of birds found in North and Middle America, including adjacent islands.

**Table 1. Bird Species Encountered During Field Investigations**

			General Habitat Preferences			
			Hardwoods	Softwoods <sup>1</sup>	Openings <sup>2</sup>	Other <sup>3</sup>
Common Name	Scientific Name	Notable Status or Comments				
Ruffed Grouse	<i>Bonasa umbellus</i>		X		X	
Wild Turkey	<i>Meleagris gallopavo</i>	Adult with young near Trapp Road - 1Jun2005	X		X	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Calling adult in mixed woods of Polygon 3	X			
Broad-winged Hawk	<i>Buteo platypterus</i>	One encounter 13Jul2005	X			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Breeding status uncertain	X		X	
Ring-billed Gull	<i>Larus delawarensis</i>	Flyover of property; not breeding at Teal Farm				
Mourning Dove	<i>Zenaida macroura</i>				X	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Rare; male calling at northern edge of Polygon 17			X	
Ruby-throated Hummingbird	<i>Archilochus colubris</i>		X			
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Stewardship Species sporadic in hardwoods	X			
Hairy Woodpecker	<i>Picoides villosus</i>		X			
Northern Flicker	<i>Colaptes auratus</i>		X			
Pileated Woodpecker	<i>Dryocopus pileatus</i>		X			
Eastern Wood-Pewee	<i>Contopus virens</i>		X			
Alder Flycatcher	<i>Empidonax alnorum</i>	Common near openings			X	
Least Flycatcher	<i>Empidonax minimus</i>				X	
Eastern Phoebe	<i>Sayornis phoebe</i>		X			
Eastern Kingbird	<i>Tyrannus tyrannus</i>				X	
Blue-headed Vireo	<i>Vireo solitarius</i>	Stewardship Species encountered in Polygon 3		X		
Warbling Vireo	<i>Vireo gilvus</i>	Only encounter near school on 1Jun2005				X
Red-eyed Vireo	<i>Vireo olivaceus</i>		X			
Blue Jay	<i>Cyanocitta cristata</i>		X	X	X	
American Crow	<i>Corvus brachyrhynchos</i>		X	X	X	
Tree Swallow	<i>Tachycineta bicolor</i>				X	X
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	One near farmhouse; may be sporadic breeder			X	X
Barn Swallow	<i>Hirundo rustica</i>				X	X
Black-capped Chickadee	<i>Poecile atricapillus</i>		X	X		
Red-breasted Nuthatch	<i>Sitta canadensis</i>			X		
Brown Creeper	<i>Certhia americana</i>		X	X		
Winter Wren	<i>Troglodytes troglodytes</i>		X	X		
Eastern Bluebird	<i>Sialia sialis</i>				X	
Veery	<i>Catharus fuscescens</i>		X	X		
Hermit Thrush	<i>Catharus guttatus</i>			X		
Wood Thrush	<i>Hylocichla mustelina</i>	Watch List species; encountered Polygons 1 & 10		X		

<sup>1</sup> Includes mixed woods

<sup>2</sup> Includes woodland edges

<sup>3</sup> Includes farmstead ponds and nearby openings

Common Name	Scientific Name	Notable Status or Comments	General Habitat Preferences			
			Hardwoods	Softwoods <sup>1</sup>	Openings <sup>2</sup>	Other <sup>3</sup>
American Robin	<i>Turdus migratorius</i>		X	X	X	
Gray Catbird	<i>Dumetella carolinensis</i>				X	
Brown Thrasher	<i>Toxostoma rufum</i>	Stewardship Species at hayfield edge at entrance road.			X	
European Starling	<i>Sturnus vulgaris</i>		X		X	X
Cedar Waxwing	<i>Bombycilla cedrorum</i>		X	X	X	
Yellow Warbler	<i>Dendroica petechia</i>				X	
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	Stewardship Species at forest edges			X	
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>		X			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			X		
Black-throated Green Warbler	<i>Dendroica virens</i>	Stewardship Species in mixed woods or hardwoods		X		
Blackburnian Warbler	<i>Dendroica fusca</i>	Stewardship Species at mixed or coniferous woods		X		
Blackpoll Warbler	<i>Dendroica striata</i>	Only in (marginal) montane spruce-fir		X		
Black-and-white Warbler	<i>Mniotilta varia</i>		X	X		
American Redstart	<i>Setophaga ruticilla</i>		X	X		
Ovenbird	<i>Seiurus aurocapilla</i>		X			
Louisiana Waterthrush	<i>Seiurus motacilla</i>	Stewardship Species along Brush Brook				X
Mourning Warbler	<i>Oporornis philadelphia</i>	Stewardship Species in regenerating hardwoods	X			
Common Yellowthroat	<i>Geothlypis trichas</i>				X	
Canada Warbler	<i>Wilsonia canadensis</i>	Stewardship Species in regenerating woods	X	X		
Scarlet Tanager	<i>Piranga olivacea</i>		X			
Chipping Sparrow	<i>Spizella passerina</i>				X	
Field Sparrow	<i>Spizella pusilla</i>	One fleeting encounter; may not breed at Teal Farm			X	
Savannah Sparrow	<i>Passerculus sandwichensis</i>				X	
Song Sparrow	<i>Melospiza melodia</i>				X	
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Stewardship Species in northern hardwoods	X	X		
Dark-eyed Junco	<i>Junco hyemalis</i>			X		
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>		X			
Indigo Bunting	<i>Passerina cyanea</i>	Stewardship Species in overgrown openings			X	
Bobolink	<i>Dolichonyx oryzivorus</i>	In active hayfields and Polygon 17			X	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Breeding in homestead farm pond				X
Common Grackle	<i>Quiscalus quiscula</i>					X
Brown-headed Cowbird	<i>Molothrus ater</i>	Uncommon at Teal Farm	X		X	
Baltimore Oriole	<i>Icterus galbula</i>		X		X	
American Goldfinch	<i>Carduelis tristis</i>		X	X		

<sup>1</sup> Includes mixed woods

<sup>2</sup> Includes woodland edges

<sup>3</sup> Includes farmstead ponds and nearby openings

**Table 2. Additional Bird Species Expected to Breed at Teal Farm**

Common Name	Scientific Name	Notable Status or Comments
Mallard	<i>Anas platyrhynchos</i>	An unlikely but possible breeder at farm ponds
Northern Harrier	<i>Circus cyaneus</i>	Reported in previous year near active hayfields <sup>1</sup>
Cooper's Hawk	<i>Accipiter cooperii</i>	Hardwoods
American Kestrel	<i>Falco sparverius</i>	Reported in previous year near active hayfields <sup>1</sup>
American Woodcock	<i>Scolopax minor</i>	Reported as fairly regular <sup>1</sup>
Barred Owl	<i>Strix varia</i>	Most any woodland community
Downy Woodpecker	<i>Picoides pubescens</i>	Hardwoods
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Hardwoods
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Hardwoods
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Possible breeder in softwoods
Swainson's Thrush	<i>Catharus ustulatus</i>	Reported as either breeder or migrant <sup>1</sup>
Pine Warbler	<i>Dendroica pinus</i>	Softwoods
Eastern Meadowlark	<i>Sturnella magna</i>	Potential breeder in fields
Purple Finch	<i>Carpodacus purpureus</i>	Softwoods
House Finch	<i>Carpodacus mexicanus</i>	Woodlands and edges
House Sparrow	<i>Passer domesticus</i>	Openings and farm buildings

<sup>1</sup> Paul Goodhouse (personal communication)

**Table 3. Priority Bird Species Encountered at Teal Farm**

Common Name	Scientific Name	Conservation Status <sup>1</sup>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Stewardship Species
Blue-headed Vireo	<i>Vireo solitarius</i>	Stewardship Species
Wood Thrush	<i>Hylocichla mustelina</i>	Watch List
Brown Thrasher	<i>Toxostoma rufum</i>	Stewardship Species
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	Stewardship Species
Black-throated Green Warbler	<i>Dendroica virens</i>	Stewardship Species
Blackburnian Warbler	<i>Dendroica fusca</i>	Stewardship Species
Louisiana Waterthrush	<i>Seiurus motacilla</i>	Stewardship Species
Mourning Warbler	<i>Oporornis philadelphia</i>	Stewardship Species
Canada Warbler	<i>Wilsonia canadensis</i>	Watch List
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Stewardship Species
Indigo Bunting	<i>Passerina cyanea</i>	Stewardship Species

## 6.0 Bird Species and their Habitats

From a bird's-eye-view, Teal Farm is a patchwork of habitats: grassland areas associated with agriculture; overgrown fields (often associated with fallow farmland); forested areas; small ponds; and marginal wetlands. Of course, the land we now call Teal Farm (indeed all of Vermont's landscape) has changed dramatically in the past two centuries. The pre-settlement landscape was dominated by forests, with grasslands and other openings. Then came settlers, their saws, and the dawn of agriculture in Vermont. It had obvious ramifications for birds. Today, a suite of environmental concerns (ranging from global warming to pesticides) as well as changing land-use patterns continue to present challenges and consequences for birds. Even so, the use of land at Teal Farm has arguably the most immediate and direct effect on the property's avifauna. With that in mind, the following offers a brief summary of major habitat types at Teal Farm and notable birds encountered there during this investigation.

### 6.1 Grasslands

The rise of agriculture in Vermont, particularly in the lowlands of the Champlain Valley, opened a forested Vermont landscape not only to sheep and cows, but to a suite of grassland bird species. Yet during the past three decades, grassland species have shown steep and geographically widespread population declines, more so than any other guild of North American birds, including Neotropical migrants (LaRoe 1995). Reasons for grassland bird decline in the Northeast include farmland abandonment with subsequent succession to woodland habitat, decline of hayfield area, and increased haycropping during the nesting season.

While certain key grassland species once inhabited Vermont, and are now extirpated (e.g. Henslow's Sparrow), the state does not figure prominently in grassland species restoration on a continental scale. And with grasslands obviously limited in scope at Teal Farm, future conservation and research options remain limited. One notable exception is Bobolink (*Dolichonyx oryzivorus*). This species was detected in active hayfields and in the large, bush-hogged upper field toward the property's southern half. Bobolink may present future research options at Teal Farm (details in Section 7.0).

### 6.2 Shrublands

The abandonment of farmland (undesirable for grassland bird species), often gives rise to early successional shrubland habitat – what at Teal Farm might commonly be called overgrown fields. The loss of agricultural grasslands to these shrubby fields can benefit a second tier of bird species of high conservation priority. These include Golden-winged Warbler (*Vermivora chrysoptera*), American Woodcock (*Scolopax minor*), Brown Thrasher (*Toxostoma rufum*) and Common Nighthawk (*Chordeiles minor*), for example. American Woodcock<sup>1</sup> and Brown Thrasher were encountered at Teal Farm. Yet while they may warrant attention as conservation priorities on the property, substantive shrublands are so lacking at Teal Farm that this habitat most likely will not figure into future conservation planning. One potential exception is the large, bush-hogged upper field toward the property's southern half. Pending future investigations, it may have the potential to be managed for certain shrubland species.

### 6.3 Wetlands

Teal Farm has no wetlands of avian significance, with the exception of a small willow-gramminoid shrub swamp (polygon 34) at the southern farm pond. No notable wetland bird species were encountered during this field investigation.

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<sup>1</sup> Paul Goodhouse (personal communication)

## 6.4 Forestland

Woodlands obviously comprise the majority of the habitat at Teal Farm investigated for this study. These forest communities, hosting some priority bird species, present conservation opportunities, challenges and potential areas for future research at Teal Farm.

### Northern Hardwoods Communities

Northern hardwood communities comprise the majority of the forest cover at Teal Farm. These include what is typically called Northern Hardwood Forest and Rich Northern Hardwood Forest (Thompson and Sorenson, 2000). For the general purposes of this breeding bird survey, the hardwood forest communities are combined and called “Northern Hardwoods.”

Hardwood communities at Teal Farm host a characteristic array of landbird species. These include (to name only a few) Yellow-bellied Sapsucker (*Sphyrapicus varius*), Red-eyed Vireo (*Vireo olivaceus*), Black-capped Chickadee (*Poecile atricapillus*), Black-throated Blue Warbler (*Dendroica caerulescens*), Scarlet Tanager (*Piranga olivacea*) and Rose-breasted Grosbeak (*Pheucticus ludovicianus*).

Without more intensive field investigations, it is difficult to characterize the relative abundance and overall status of hardwood species at Teal Farm. But it is safe to report that the hardwoods at the property exhibited a fairly typical suite of species, similar to that found in other hardwood communities across Vermont.

Priority species discovered in Teal Farm’s Northern Hardwoods include Yellow-bellied Sapsucker (*Sphyrapicus varius*), Black-throated Green Warbler (*Dendroica virens*), Mourning Warbler (*Oporornis philadelphia*), and White-throated Sparrow (*Zonotrichia albicollis*).

### Softwood Communities

Teal Farm has limited and marginal softwood communities. These are the upper-elevation Montane Yellow Birch-Red Spruce Forest and a contiguous Montane Spruce-Fir Forest, located at the property’s southeastern section, between 2,000 feet and 2,280 feet in elevation. These forest communities cannot be classified as exemplary mountain softwood communities, owing to their small size and patchy nature. Evidence of the limited nature of these communities can be found in hardwood bird species found within or nearby these communities during survey work. These include Ovenbird (*Seiurus aurocapilla*) and Black-throated Blue Warbler. Nevertheless, these mountain communities do host a few bird species unlikely to be found elsewhere at Teal Farm, including Blackpoll Warbler (*Dendroica striata*) and Yellow-rumped Warbler (*Dendroica coronata*)

The notable find during point counts in Teal Farm’s Montane Yellow Birch-Red Spruce Forest and the contiguous Montane Spruce-Fir Forest community was Canada Warbler (*Wilsonia canadensis*), which tends to prefer cool, moist, deciduous and mixed forests with a dense shrub understory. Canada Warbler is a Watch List species that may warrant further attention at Teal Farm. (Details in Section 7.0.)

## 7.0 Planning Recommendations

Birds constitute only one group of organisms among the natural communities of Teal Farm. Birds coexist with other wildlife ranging from Short-tailed Shrew to Eastern Tailed-Blue. And it is obvious that avifaunal abundance and distribution depends, more broadly, on local land-use

decisions and even global forces buffeting Teal Farm. It should also be obvious that conservation of one taxon of organisms isn't always consistent with the conservation of another. Cutting trees to create habitat for white-tailed deer or eastern cottontail rabbits is inconsistent with protecting habitat for woodland warblers and other songbirds, for example, but it can create fine habitat for butterflies or even certain songbird species.

Detailed management options for bird diversity at Teal Farm is beyond the scope of this report. Indeed, it may likely be the case that the conservation of birds alone warrants no elevated status among the organisms inhabiting Teal Farm. However, the three following species may be considered for future conservation measures and or research opportunities at Teal Farm.

### **Wood Thrush**

A woodland species with an ethereal song, Wood Thrush has become something of a celebrity in North American landbird conservation planning, owing in part to population declines attributed to factors on its breeding grounds (including acid rain) and its wintering range in Latin America. Wood Thrush's habitat associations are nevertheless somewhat diverse — principally deciduous forest, locally in dense second-growth, mixed woods, and even parks and suburbs with dense shrub layer.

Wood Thrush was present but scarce at Teal Farm during this investigation. Three individuals comprised the sightings: two counter-singing males in wet, mesic regenerating woods (polygon 3 — Jun2005) and a single singing male in hemlock-northern hardwoods (polygon 46 — 6Jun2005).

While it is beyond the scope of this investigation to suggest specific management or research options relating to Wood Thrush, its presence at Teal Farm would warrant some level of consideration as part of any silvicultural planning or practices. With its somewhat varied habitat preferences, additional field studies would be required to ascertain better understanding of the ecology of the species at Teal Farm.

### **Canada Warbler**

Canada Warbler is a neotropical migrant songbird that winters in South America and breeds in the northeastern United States, southeastern Canada, and in boreal forests extending west into Alberta. Despite its apparent tolerance of varied habitat types, Canada Warbler is patchily distributed, typically at low densities, throughout the Northeast, which comprises a significant portion of its global range. In addition, Canada Warbler has exhibited steep population declines, with trend estimates ranging between -2.4% (Rosenberg and Hodgman 2000) and -13.2% per year (Faccio et al. 1998).

The disturbing population decline in Canada Warbler warrants conservation strategies that may be adopted at Teal Farm. These may necessitate a combination of land protection and habitat management. Detailed management strategies are included in *Canada Warbler Population Status, Habitat Use, and Stewardship Guidelines for Northeastern Forests* (Lambert 2005). Key excerpts among a list of management and conservation strategies from this report include:

- ◆ Provide a continuous supply of old, uneven-aged, and/or regenerating stands. Even-aged forests 20-75 years old appear to be of low value to Canada Warblers.
- ◆ Maintain large, contiguous areas of unmanaged forest.
- ◆ Plan for and tolerate natural disturbances (such as spruce budworm outbreaks and major wind events) that create gaps in the canopy and/or increase invertebrate food supply.

- ◆ Maintain or restore mixed forest cover at the stand level.
- ◆ Maintain or enhance a well-developed woody and herbaceous understory.
- ◆ When logging, control damage to the understory by directional felling; winching instead of skidding from each stump; using a feller-buncher with a boom, restricted to a designated trail; working around shrubby pockets; harvesting when a heavy snow pack is present.
- ◆ Restrict tree removal between the dates of Canada Warbler territory establishment (May 20) and fledging (July 31).

Much work remains to be done on the status of Canada Warbler, some of which may present research options at Teal Farm. Potential sources of inquiry include estimates of adult and brood survival, nesting success, frequency of re-nesting following nest failure and site fidelity (Conway 1999). Also lacking is basic information on timing and duration of different phases of breeding: nest construction, egg-laying, incubation, and nestling development.

Mercury deposition and bioaccumulation may provide another avenue of investigation at Teal Farm. Anthropogenic sources of mercury have been shown to present a clear and present danger to wildlife, particularly in northeastern North America (Evers 2005). Most investigations into the transfer and fate of mercury in the environment have focused on freshwater aquatic ecosystems. But a body of convincing evidence shows a much broader threat, including methyl mercury's availability to insectivorous birds in terrestrial montane ecosystems (Rimmer 2005). Preliminary results of sampling of Canada Warblers from a New Hampshire swamp revealed elevated blood levels of mercury (*Steve Faccio, personal communication*). Vermont-based researchers intend to compare mercury levels in Canada Warblers sampled from both wetland and high-elevation habitats. Teal Farm's Canada Warblers, in the shadow of Camel's Hump, may provide a data source for this line of inquiry.

### **Bobolink**

Although it is not considered a priority species, Bobolink is nonetheless attracting attention in Vermont owing to general population declines and threats on its wintering grounds. With Bobolinks encountered in both actively hayed portions of Teal Farm as well as in the bush-hogged field at the property's southern portion, the species may offer a source of inquiry for future investigators.

Researchers at the University of Vermont (Dr. Allan M. Strong) and the Vermont Institute of Natural Science (Dr. Rosalind Renfrew) are actively investigating Bobolink breeding and wintering ecology. Besides standard conservation recommendations about delaying haying and bush-hogging operations until after Bobolink fledge dates, Teal Farm may also serve as a site for research on this grassland species.

One noteworthy research option involves concerns about the effects of long-term delayed mowing. One such concern would be the potential increase in exotic species as a result of late mowing. Another would be the accumulation of organic matter if the litter is not baled; this seems to decrease the habitat quality during the initial settlement periods for Bobolinks returning the following spring. A third concern about delayed mowing would be a potential change in species composition from grasses to forbs. All of these have the potential to decrease habitat quality over time (*Allan Strong, personal communication*).

## 8.0 Conclusion

Besides the innovative vision of its owners and managers, one other noteworthy quality of Teal Farm may be its lack of noteworthy birds. This basic investigation revealed no bird species listed as threatened or endangered under state or federal laws. To be sure, some species warrant careful attention during land-use planning at the farm. Yet, overall, Teal Farm exhibits a suite of breeding birds fairly typical for Vermont's Northern Green Mountains biophysical region. Depending on the longer-term goals of Foundation for a Sustainable Future, the typical nature of Teal Farm's avifauna may indeed be the farm's strength.

Northern Hardwood communities, dominant at Teal Farm, are in many respects the essence and the soul of Vermont's working woodland landscape and (such as they are) its relatively intact forests. For that reason, and for the well-expressed interests of FSF, Teal Farm may serve as a research site for new research or as part of the established and respected tradition of avian conservation biology in Vermont.

For the better part of the last 150 years, birds have been a major focus and force in the study of natural history. They have taught us much about our surroundings and ourselves. They are a taxon represented by a body of research among the most extensive in the annals of zoology. But our understanding of them is far from complete. With some hope for the future, and this study as a first step, perhaps Teal Farm may offer us even higher insights expressed in a greater understanding of the ecology of the farm's breeding birds.

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**The Breeding Birds of Teal Farm**  
Huntington, Vermont  
Spring 2005

Report Date: March 20, 2006



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