

OCCURRENCE OF BIRD SPECIES ON HYBRID POPLAR  
PLANTATIONS AND ADJACENT LAND  
USES IN THE NORTH-CENTRAL U.S.

JoAnn M. Hanowski

Center for Water and the Environment  
Natural Resources Research Institute  
University of Minnesota Duluth  
Duluth, MN 55812

Natural Resources Research Institute  
Technical Report  
NRRI/TR-96-17

1996

ZZ  
2651  
VERT  
FILE

## INTRODUCTION

We have been studying songbirds and small mammals occupying hybrid poplar plantations in the north-central United States for the past several years. The overall objective of this project is to evaluate the possible biodiversity implications of large-scale woody biomass development, and to provide a basis for managing plantations with biodiversity goals in mind. Results of our initial studies on songbirds and small mammals are described in Christian et al. (1997), including patterns of occurrence and abundance on plantations and adjacent land use types. In that study, the occurrence of individual bird species was inconsistent across plantations. In addition, the abundance of many species on plantations was extremely low. For these reasons, Christian et al. (1997) presented and analyzed abundance data only for major migration guilds (long-distance migrants, short-distance migrants, and permanent residents) of birds, and not for individual species.

In this technical report, I provide a tabulation of the occurrence of individual bird species on hybrid poplar plantations and adjacent land uses in both agricultural and forested parts of the study area (Table 1). This information is intended to accompany the analyses presented in Christian et al. (1997). However, because of the sporadic occurrence and relatively low abundance of some bird species on plantations, these data were not analyzed statistically and no conclusions about species presence are presented.

Financial support for this research was provided by the North Central Forest Experiment Station of the U. S. Department of Agriculture (USDA) Forest Service, the U. S. Department of Energy through the Biofuels Feedstock Development Program at Oak Ridge National Laboratory, the National Audubon Society, and the University of Minnesota.

We thank landowners and staff at the Northern States Power Plant at Granite Falls for their cooperation.

## **STUDY AREAS**

Birds were studied on 8 hybrid poplar plantations and surrounding land uses in Minnesota, Wisconsin, and South Dakota; six study sites were located in forested areas, two in predominately agricultural areas. The plantations were established by the USDA Forest Service, the U.S. Department of Energy, the Electric Power Research Institute, and Energy Performance Systems, Inc., primarily as sites for clonal trials and yield tests. Each plantation included several poplar clones, each planted in a block or strip. Trees were hand planted as cuttings in a rectangular grid pattern (2.5 m between trees). Disking in both directions between rows of trees and herbicide application reduced or eliminated shrub and ground cover, except in areas where weed control was abandoned after a clone had failed or where features such as natural drainage courses made weed control difficult. Weed or grass cover developed in most of these patches and small-diameter woody debris accumulated in some. All plantations were disked during 1992, when our studies were conducted. For purposes of analysis, surrounding land use types were categorized as non-wooded wildland (including old fields and CRP grasslands), wooded wildlands (forests, shrublands, shelterbelts), row crop/small grains, and hayfields/pasture.

The following designations are used for the study sites (county, plantation area, and date of planting in parentheses) - Forested zone: Ashland 1 (Ashland Co., Wi.; 4.0 ha, 1987), Ashland 2 (Ashland Co., Wi.; 3.6 ha, 1988; 3.3 km distant from Ashland 1), Cloquet (Carlton Co., Minn.; 3.2 ha, 1988), Milaca (Mille Lacs Co., Minn.; 3.6 ha, 1987), Mondovi

(Buffalo Co., Wi.; 4.0 ha, 1987; 2.6 ha, 1988), and Granite Falls (Chippewa Co., Minn., 2.7 ha, 1987); Agricultural zone: Sioux Falls 1 and Sioux Falls 2 (Minnehaha Co., S. D.; 4.0 ha each, 1 planted 1987, 1 planted 1988) and Fairmont (Martin Co., Minn.; 4.3 ha, 1988).

Plantations were established in former agricultural croplands, and land uses bordering plantations at all sites included croplands or hayfield/pasture. A forest was located within about 150 m of the nearest edge of the plantation at Cloquet. Other plantations in the forested zone were bordered by forest on at least one edge. Wooded wildland habitat in the agricultural zone included a shelterbelt at Sioux Falls and scattered riparian trees near the Fairmont plantation.

## **METHODS**

At each site, birds were sampled in the plantation and in all land use types immediately adjacent to the plantation. We used a line transect (Järvinen and Väisänen 1975, Hanowski et al. 1990) through the center of the plantation and around the entire perimeter of the plantation about 250 m from the plantation center transect. Bird species were identified by sight and sound, and observations included data on habitat association. Birds flying over the study area were counted only if it was determined that they were foraging over the site. All sites were sampled one-half hour before - 4 hours after sunrise on days with no rainfall and with wind speed <25 km/hour. Line transects were walked at a rate of about 20 m/min. Data on cloud cover, temperature, and wind speed were collected at the beginning and end of each sampling period. When possible, direction of travel along transects was varied between visits to a site to avoid consistently sampling one habitat type earlier or later in the morning. Each plantation and the adjacent land use

types were sampled in early and late June, and monthly from July through October.

#### **LITERATURE CITED**

Christian, D. P., P. T. Collins, J. M. Hanowski, and G. J. Niemi. 1997. Bird and small mammal usage of short-rotation hybrid poplar plantations. *Journal of Wildlife Management*, *in press*.

Hanowski, J.M., G.J. Niemi, and J.G. Blake. 1990. Statistical perspectives and experimental design in counting birds with line transects. *Condor* 92:326-335.

Jarvinen, O., and R. Vaisanen. 1975. Estimating the relative densities of breeding birds by the line transect method. *Oikos* 26: 316-322.

Table 1. Common and scientific names of birds observed on hybrid poplar plantations and each adjacent land-use type during the breeding season or fall migration on hybrid poplar plantations and adjacent land-use types in the agricultural (a) or forested (f) zones of Minnesota, Wisconsin, and South Dakota.

Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
Canada Goose ( <u><i>Branta canadensis</i></u> )				a	
Blue-winged Teal ( <u><i>Anas discors</i></u> )	a				
Northern Harrier ( <u><i>Circus cyaneus</i></u> )		f	a	a,f	
Red-tailed Hawk ( <u><i>Buteo jamaicensis</i></u> )	f	f			
American Kestrel ( <u><i>Falco sparverius</i></u> )				a	
Gray Partridge ( <u><i>Perdix perdix</i></u> )				a	a
Ring-necked Pheasant ( <u><i>Phasianus colchicus</i></u> )	a,f	a,f	a	a	a
Ruffed Grouse ( <u><i>Bonasa umbellus</i></u> )		f			f
Wild Turkey ( <u><i>Meleagris gallopavo</i></u> )	f	f			
Killdeer ( <u><i>Charadrius vociferus</i></u> )	a,f		a,f	a,f	a
Upland Sandpiper ( <u><i>Bartramia longicauda</i></u> )				a	
Common Snipe ( <u><i>Gallinago gallinago</i></u> )	f				f
American Woodcock ( <u><i>Scolopax minor</i></u> )		f			f
Mourning Dove ( <u><i>Zenaidura macroura</i></u> )	a,f	a,f	a,f	a,f	a,f
Black-billed Cuckoo ( <u><i>Coccyzus erythrophthalmus</i></u> )		f			f
Yellow-billed Cuckoo ( <u><i>Coccyzus americanus</i></u> )		a,f			a
Great Horned Owl ( <u><i>Bubo virginianus</i></u> )		f			
Chimney Swift ( <u><i>Chaetura pelagica</i></u> )	a	f			
Ruby-throated Hummingbird ( <u><i>Archilochus colubris</i></u> )	f	f			

Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
Red-headed Woodpecker ( <i>Melanerpes erythrocephalus</i> )	a	a,f			
Red-bellied Woodpecker ( <i>Melanerpes carolinus</i> )		f			
Yellow-bellied Sapsucker ( <i>Sphyrapicus varius</i> )	f	f			
Downy Woodpecker ( <i>Picoides pubescens</i> )	f	f			
Hairy Woodpecker ( <i>Picoides villosus</i> )		f			f
Northern Flicker ( <i>Colaptes auratus</i> )	f	a,f		f	a,f
Pileated Woodpecker ( <i>Dryocopus pileatus</i> )		f			
Eastern Wood-Pewee ( <i>Contopus virens</i> )		f			
Yellow-bellied Flycatcher ( <i>Empidonax flaviventris</i> )	f				
Acadian Flycatcher ( <i>Empidonax virescens</i> )	f				
Alder Flycatcher ( <i>Empidonax alnorum</i> )	f	f		f	f
Willow Flycatcher ( <i>Empidonax traillii</i> )	f	a			a
Least Flycatcher ( <i>Empidonax minimus</i> )		f			f
Eastern Phoebe ( <i>Sayornis phoebe</i> )	a	a,f			
Great Crested Flycatcher ( <i>Myiarchus crinitus</i> )	f	a,f			
Western Kingbird ( <i>Tyrannus verticalis</i> )	a	a		a	
Eastern Kingbird ( <i>Tyrannus tyrannus</i> )	a,f	a,f	a,f	a,f	a
Horned Lark ( <i>Premophila alpestris</i> )			a,f		
Tree Swallow ( <i>Tachycineta bicolor</i> )	f	a		f	
Northern Rough-winged Swallow ( <i>Stelgidopteryx serripennis</i> )	f				
Bank Swallow ( <i>Riparia riparia</i> )	f				
Cliff Swallow ( <i>Hirundo pyrrhonota</i> )			a	a,f	
Barn Swallow ( <i>Hirundo rustica</i> )	a,f	a	a	a,f	

Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
Blue Jay ( <i>Cyanocitta cristata</i> )	f	f	a	f	a,f
American Crow ( <i>Corvus brachyrhynchos</i> )	a	f		a,f	f
Black-capped Chickadee ( <i>Parus atricapillus</i> )	f	a,f		f	a,f
Red-breasted Nuthatch ( <i>Sitta canadensis</i> )		f			
White-breasted Nuthatch ( <i>Sitta carolinensis</i> )		a,f			
House Wren ( <i>Troglodytes aedon</i> )	a,f	a,f			a
Winter Wren ( <i>Troglodytes troglodytes</i> )		f			
Sedge Wren ( <i>Cistothorus platensis</i> )	a,f	f	f	a,f	
Ruby-crowned Kinglet ( <i>Regulus calendula</i> )	f	a,f		f	a
Eastern Bluebird ( <i>Sialia sialis</i> )		f			
Veery ( <i>Catharus fuscescens</i> )		f		f	a,f
Hermit Thrush ( <i>Catharus guttatus</i> )		f			f
Wood Thrush ( <i>Hylocichla mustelina</i> )		f			
American Robin ( <i>Turdus migratorius</i> )	a,f	a,f	a,f	a,f	a,f
Gray Catbird ( <i>Dumetella carolinensis</i> )	a,f	a,f	f		a,f
Brown Thrasher ( <i>Toxostoma rufum</i> )	f	a,f		f	a,f
Cedar Waxwing ( <i>Bombycilla cedrorum</i> )		a,f		f	a,f
European Starling ( <i>Sturnus vulgaris</i> )	a	a,f	a	a,f	a
Solitary Vireo ( <i>Vireo solitarius</i> )		f			
Yellow-throated Vireo ( <i>Vireo flavifrons</i> )		f			
Warbling Vireo ( <i>Vireo gilvus</i> )		f			a
Red-eyed Vireo ( <i>Vireo olivaceus</i> )		a,f			f
Golden-winged Warbler ( <i>Vermivora chrysoptera</i> )		f			f



Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
Tennessee Warbler ( <i>Vermivora peregrina</i> )		f			
Orange-crowned Warbler ( <i>Vermivora celata</i> )		f			
Nashville Warbler ( <i>Vermivora ruficapilla</i> )		f			f,a
Yellow Warbler ( <i>Dendroica petechia</i> )	a,f	a,f	f		a,f
Chestnut-sided Warbler ( <i>Dendroica pensylvanica</i> )	f	a,f		f	a
Yellow-rumped Warbler ( <i>Dendroica coronata</i> )		f			f
Palm Warbler ( <i>Dendroica palmarum</i> )	f	f			
Black-and-white Warbler ( <i>Mniotilta varia</i> )		f			
American Redstart ( <i>Setophaga ruticilla</i> )		f			
Ovenbird ( <i>Seiurus aurocapillus</i> )		f			a
Northern Waterthrush ( <i>Seiurus noveboracensis</i> )		f			f
Mourning Warbler ( <i>Oporornis philadelphia</i> )		a,f		f	a,f
Common Yellowthroat ( <i>Geothlypis trichas</i> )	a,f	a,f	f	a,f	a,f
Scarlet Tanager ( <i>Piranga olivacea</i> )		f			
Northern Cardinal ( <i>Piranga cardinalis</i> )	a,f	f			f
Rose-breasted Grosbeak ( <i>Pheucticus ludovicianus</i> )	a,f	a,f			a,f
Indigo Bunting ( <i>Passerina cyanea</i> )	f	a,f		f	a,f
Dickcissel ( <i>Spiza americana</i> )	a				
Rufous-sided Towhee ( <i>Pipilo erythrophthalmus</i> )		f			f
American Tree Sparrow ( <i>Spizella arborea</i> )	a,f	f			
Chipping Sparrow ( <i>Spizella passerina</i> )		a,f		a,f	a,f
Clay-colored Sparrow ( <i>Spizella pallida</i> )	f	f	a,f	f	f
Field Sparrow ( <i>Spizella pusilla</i> )	f	f			f

Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
Vesper Sparrow ( <u>Pooecetes gramineus</u> )	a		a,f	a	
Savannah Sparrow ( <u>Passerculus sandwichensis</u> )	a,f	a,f	a,f	a,f	f
Le Conte's Sparrow ( <u>Ammodramus leconteii</u> )	a,f		f	a,f	
Fox Sparrow ( <u>Passerella iliaca</u> )			f		
Song Sparrow ( <u>Melospiza melodia</u> )	a,f	a,f	a,f	a,f	a,f
Swamp Sparrow ( <u>Melospiza georgianna</u> )	a,f	f			f
White-throated Sparrow ( <u>Zonotrichia albicollis</u> )	a,f	f	f	f	f
White-crowned Sparrow ( <u>Zonotrichia leucophrys</u> )		f			
Harris' Sparrow ( <u>Zonotrichia querula</u> )	f			a	
Dark-eyed Junco ( <u>Junco hyemalis</u> )	a,f	f	f		a,f
Snow Bunting ( <u>Plectrophenax nivalis</u> )			f	f	
Bobolink ( <u>Dolichonyx oryzivorus</u> )	a,f	f		f	
Red-winged blackbird ( <u>Agelaius phoeniceus</u> )	a,f	a,f	a	a,f	a,f
Eastern Meadowlark ( <u>Sturnella magna</u> )	f	f	f	f	
Western Meadowlark ( <u>Sturnella neglecta</u> )	a,f	a	a	a,f	a
Yellow-headed Blackbird ( <u>Xanthocephalus xanthocephalus</u> )	a	a		a	
Brewer's Blackbird ( <u>Euphagus cyanocephalus</u> )	a	a,f	a	a	a
Common Grackle ( <u>Quiscalus quiscula</u> )	a	a,f	a,f	a,f	a
Brown-headed Cowbird ( <u>Molothrus ater</u> )	a,f	a,f	a	a,f	a,f
Orchard Oriole ( <u>Icterus spurius</u> )	a			a	a
Northern Oriole ( <u>Icterus galbula</u> )	a	a,f			a
Purple Finch ( <u>Carpodacus purpureus</u> )		f			
Pine Siskin ( <u>Carduelis pinus</u> )		f			

---

Common and scientific name	Land use type				
	Non-wooded wildland	Wooded wildland	Rowcrop and small grains	Pasture and hayfield	Plantation
American Goldfinch ( <i>Carduelis tristis</i> )	a,f	a,f	f	a,f	a,f
House Sparrow ( <i>Passer domesticus</i> )	a	a		a,f	a

---