



American Goldfinch nestlings in S185 – King Ferry 2001

Photo: K.V. Sydenstricker

Avian Biodiversity Studies in Short Rotation Woody Crops

September 2001

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We continued intensive monitoring of plots planted with woody crops by the Salix Consortium in Upstate and Western New York. In Table 1 we summarize the growth seasons studied in each year in each plot. We here also present a summary of the data collected during the breeding seasons 1998-2001 on nesting birds in 15 plots covering a total of 55.7 ha. In this report we analyze bird-species turnover rates, and compare changes in nest density with plant age.

METHODS

From April to September each plot was visited every 7-10 days. We used spot-mapping techniques to census birds during each visit [1,2]. Plots were also exhaustively searched for nests. Nests found were flagged and nest fate was determined during later visits. A mirror attached to a pole was used to determine nest content of nests built above eye height. If a nest was found a species was clearly using the plot for nesting. If no nests were found, but on repeated visits singing males were observed a species was categorized as “probably nesting”.

The study plots on which this report is based were planted between 1996 and 1998 thus providing plots of various ages (Table 1). We analyzed the results by plant age, because it can be expected that avian diversity changes with plot age [3].

We define plant age as follows:

Season 1 is the season in which the biomass crops were planted. During the winter after planting the plants were coppiced, generating more side sprouting in the following growing season. **Season 1a** is the year after this initial coppicing.

Seasons 2-5 are numbered consecutively.

Table 1. Plots studied 1998-2001

Site	Field	Area (ac)	Planting date	Growing Season					
				1	1a	2	3	4	5
King Ferry	Barn Site	5.5	1996			1998	1999	2000	2001
	Weather Station	3.7	1996			1998	1999	2000	2001
	Site Trial	2.7	1995		1999	2000	1998 2001		
Tully	Area 12	2.7	1995		1999	2000	1998 2001		
Lafayette	Lafayette rd.	7	1997		1998	1999	2000	2001	
	Upper Field	2	1998	1998	1999	2000	2001		
	Lower field	2	1998	1998	1999	2000	2001		
Canastota	Canastota	20	1998	1998	1999	2000	2001		
Leon	Western Field	17	1998	1998	1999	2000	2001		
	Eastern Field	16	1998	1998	1999	2000	2001		
Sheridan	Smith	10	1998	1998	1999	2000	2001		
	Hopkins	20.5	1998	1998	1999	2000	2001		
	Western Field	5	1998	1998	1999	2000	2001		
	Eastern Field	25	1998	1998	1999	2000	2001		

RESULTS

In Fig. 1 we present changes in bird biodiversity with plant age. This year's data confirms the trend found earlier for an increase in bird biodiversity until the third growing season, with a decline in later seasons. Bird density, though, increases, as illustrated by an increase in the total number of nests found. By combining the results from the nest searching with these of the spot mapping we were able to document that, at each plant age, we do not find nests of 5-6 species that were observed singing on the plots. The cavity nesting species (House Wren, European Starling, House Sparrow) were most probably not nesting.

Changes in bird biodiversity and species turnover with plant age (Fig. 1, Table 2,3)

Seven bird species were nesting or probably nesting in growth season 1a.

In season 2 one of these no longer was observed ("number no longer" in Table 3), but 11 additional species ("number new" in Table 3) were observed, so that the total number of species breeding on plots that age was 17. In season three 12 of these 17 species were still breeding, 5 had disappeared, and 6 species bred for the first time. In the subsequent seasons the total number of species decreased again, because the number of disappearing species (4 and 2) was larger than the number of new species. (one in each plant age group). A total of 26 different bird species was observed as breeder or as probable breeder in the willow and poplar plots.

*Table 2 - Bird species in plants of different ages , all years combined: *means probable breeding but no nests found; the numbers represent nest density per ha.*

Plant Growth Season	1a	2	3	4	5
Vesper Sparrow	*				
Savannah Sparrow	*	*			
American Goldfinch	0.02	1.07	1.20	1.10	1.10
Killdeer	*	0.02			
Yellow Warbler	*	0.06	0.09	1.10	0.28
Song Sparrow	*	0.12	0.09	*	*
Willow Flycatcher	*	0.18	0.25	0.78	1.38
Indigo Bunting		0.02	*		
Common Yellowthroat		0.02	0.02	*	*
Eastern Phoebe		*			
Mourning Dove		*			
Warbler Vireo		*			
European Starling		*	*		
House Wren		*	*	*	
Red Winged Blackbird		0.12	0.54	1.88	0.55
American Robin		0.16	1.08	1.88	6.35
Gray Catbird		0.22	0.72	1.72	2.21
Cedar Waxwing		0.42	0.54	1.57	0.55
Alder Flycatcher			0.02		
Chipping Sparrow			*		
House Sparrow			*		
Brown Headed Cowbird			0.02	*	
American Redstart			0.02		0.55
Wood Thrush			0.05	0.16	0.55
Baltimore Oriole				*	*
Rose Breasted Grosbeak					0.83

Table 3 – species turnover by plant age

Plant Growth Season	1a	2	3	4	5
total number	7	17	18	13	13
number new	7	11	6	1	1
number repeat		6	12	12	12
number no longer		1	5	4	2
cum number species	7	18	24	25	26

Fig. 1 - BIRD BIODIVERSITY IN WOODY CROPS NY 1998-2001

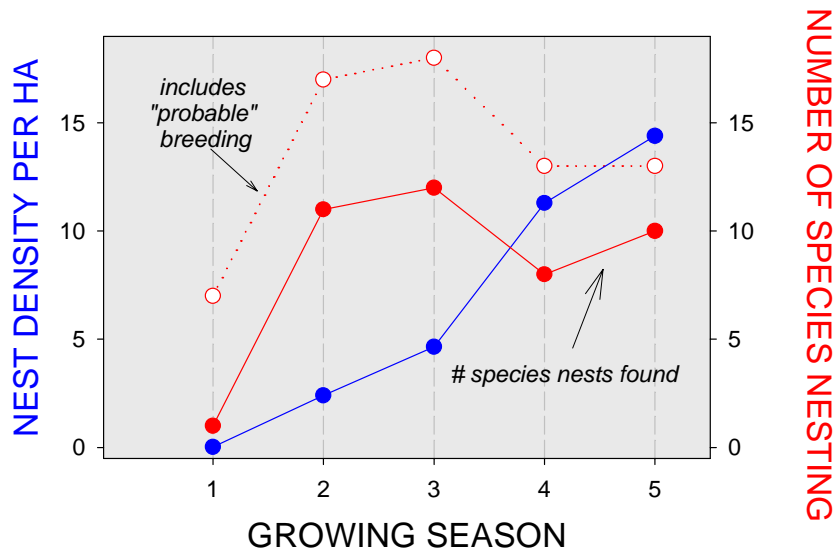
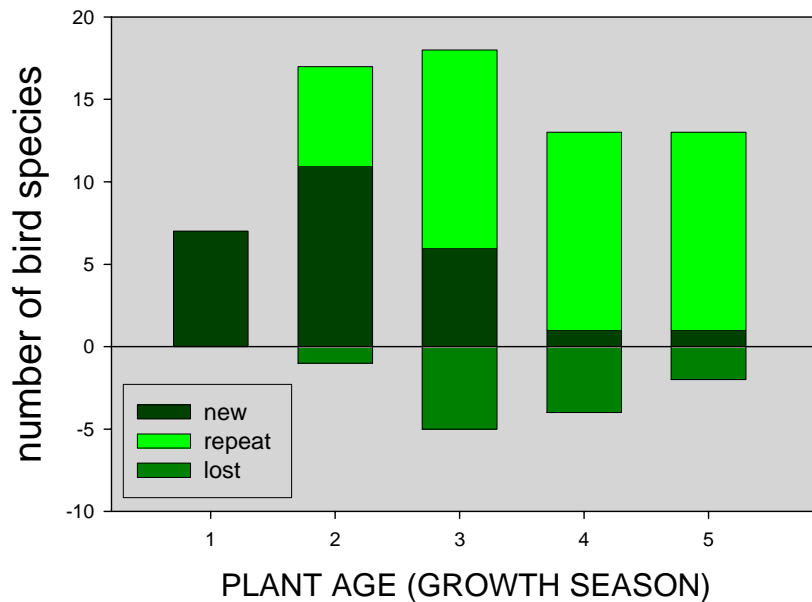
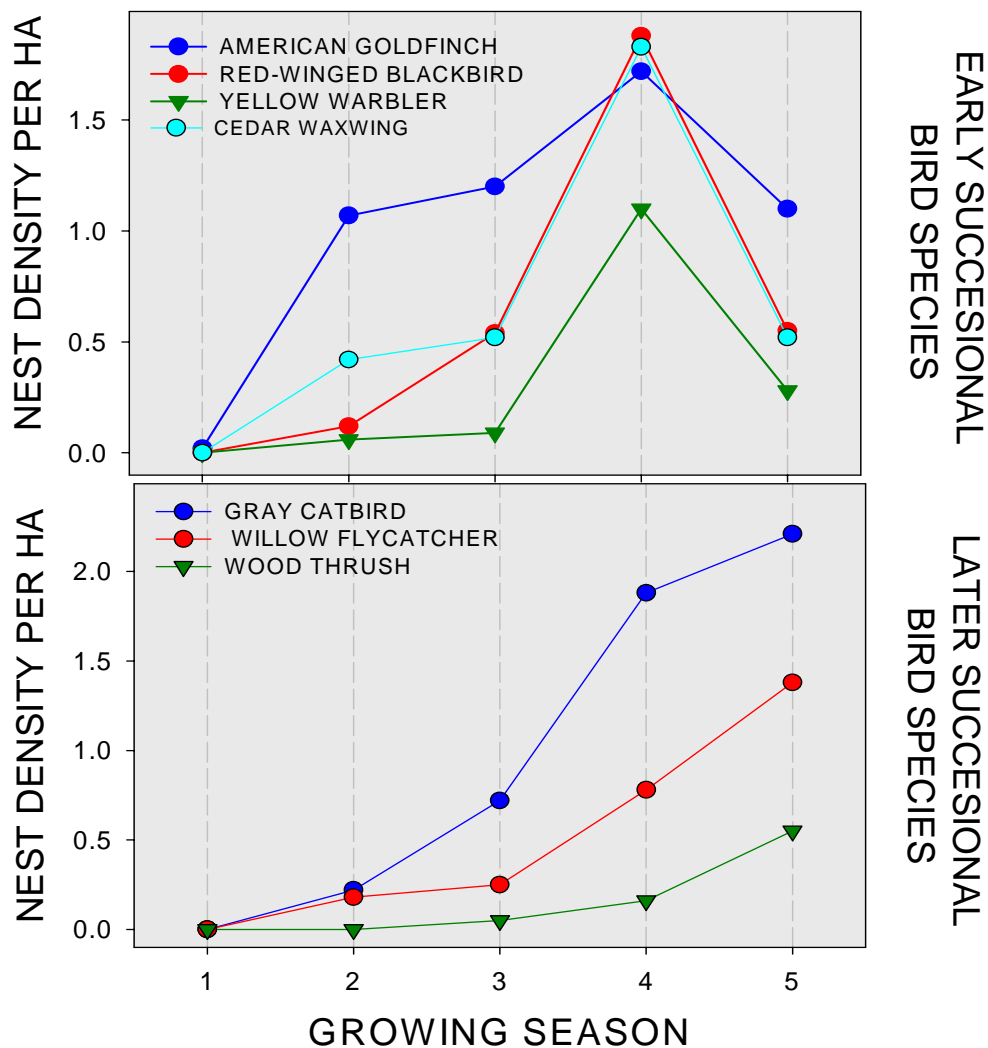


FIG 2 - BIRD SPECIES TURNOVER WITH PLANT AGE



As plants grow the aspect of the plots changes rapidly. This causes rapid changes in the species composition on these plots, with early successional species, that prefer habitat with a lot of open space, gradually being replaced by species that prefer higher trees. In the first growing season only 7 species bred or probably bred. All occurred at low densities. Nesting densities of these species gradually increase, but decline again after growth season 4 (Fig. 3 – upper panel), Bird species that prefer higher plants (or even forest) gradually become established, and their nest densities continue to increase (Fig. 3 – lower panel). Three species were found in all growing seasons: American Goldfinch, Yellow Warbler and Willow Flycatcher.

Fig. 3 - NY 1998-2001



CONCLUSIONS

1. Avian diversity and nesting density in the short-rotation woody crop plantations in Upstate New York is very much as expected in early successional habitat in the region. In later reports we will provide a comparison between the SRC plots and more natural successional habitat.
2. Although we found a few nests with cowbird egg, cowbird parasitism remains low.
3. Nesting success seems to be high. We will report in detail on nest success in the SRC plots in later reports.

REFERENCES

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