BIRD CONSERVATION ON REFORESTED BOTTOMLANDS: LANDSCAPE CONTEXT IS IMPORTANT

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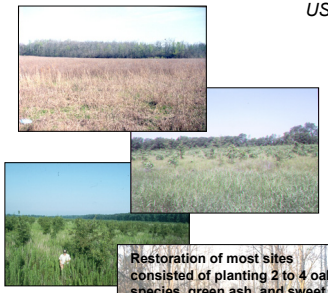
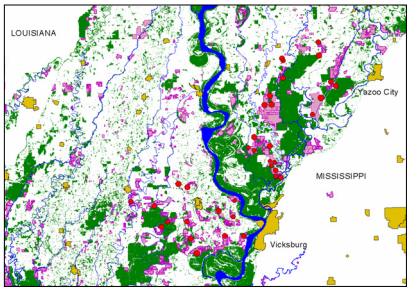
Introduction

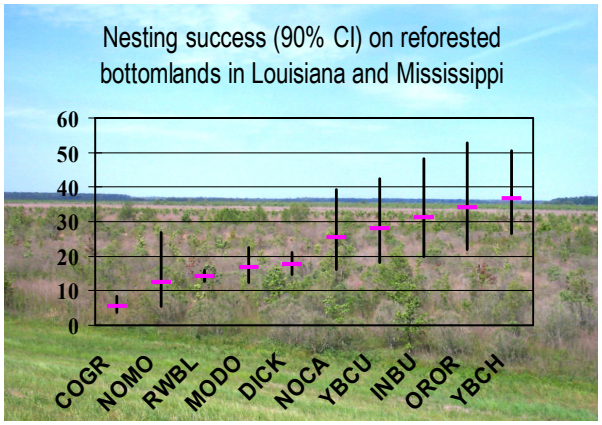
In the Lower Mississippi Valley, over 120,000 ha (300,000 acres) of agricultural land have been reforested in the last 10 years. Decisions on where to reforest are complex, but placement adjacent to large tracts of existing mature forest is usually regarded as beneficial for bird conservation. To evaluate this assumption, we compared the rate of bird colonization and their nesting success on reforested sites that abutted large tracts of mature forest and reforested sites that were adjacent to agricultural fields and distant from mature forests.



Restoration of most sites consisted of planting 2 to 4 oak species, green ash, and sweet pecan at densities of 302 stems per acre. Because, all study sites were <16 years post-planting, most sites were dominated by herbaceous vegetation with trees <4 m tall.



Location of study sites within the Mississippi Alluvial Valley in Mississippi and Louisiana. Mature forests are depicted in green, reforestation in purple, cities in gold, rivers in blue, and study locations in red.



Results

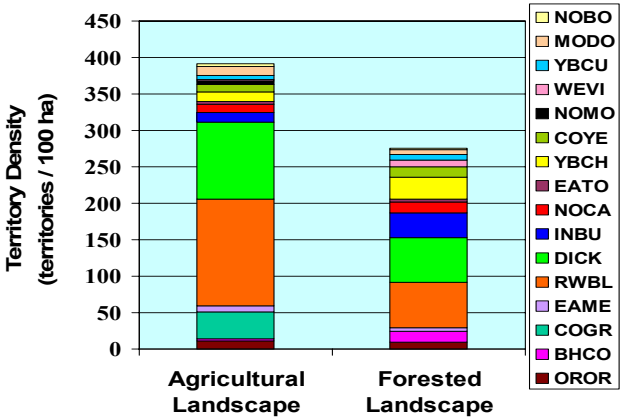
Grassland birds (Red-winged Blackbird, Eastern Meadowlark, and Dickcissel) dominated young restoration sites and sites abutting agricultural fields. Successional forest-scrub birds (White-eyed Vireo, Yellow-breasted Chat, Indigo Bunting, and Northern Cardinal) replaced grassland birds as sites aged and on sites adjacent to mature forests. Although the overall parasitism rate by Brown-headed Cowbirds was low (<4%) regardless of landscape position, species that characterized reforestation abutting mature forest suffered higher levels of parasitism (White-eyed Vireo [36%]; Indigo Bunting [32%]). Of 2173 nests that had eggs or chicks, 607 fledged young. Nest successes (Mayfield) were: Yellow-breasted Chat (37%), Orchard Oriole (36%), Indigo Bunting (29%), Northern Cardinal (27%), Yellow-billed Cuckoo (26%), Dickcissel (18%), Mourning Doves (17%), Northern Mockingbird (14%) Red-winged Blackbird (14%), and Common Grackle (6%). Predation was the primary cause of nest failure. Generalized nest survival of all songbirds (~17%) was similar on sites adjacent to agricultural fields and on sites abutting forests.

Methods

From mid-April to early August, we monitored avian abundance and nesting success on 36 reforested agricultural fields: 10 sites during 2000, 12 sites during 2001, and 14 sites during 2002. Abundance was monitored using transect counts (2000) or spot-mapping (2001, 2002). Nests were located and subsequently monitored at 2 to 4 day intervals. We estimated Mayfield nesting success and compared probabilities of daily nest survival between landscape locations. Based on observed nest survival and number of young fledged, we assessed the population stability (SOURCE or SINK) for 10 of the most common species.

Probability of daily nest survival (x ± SE) for species breeding in reforested bottomlands in agricultural and forested landscapes.

	Forested Landscape		Agricultural Landscape	
	Exposure Days	Daily Survival	Exposure Days	Daily Survival
Mourning Dove – MODO	178	0.9214 ± 0.0202	1465	0.9427 ± 0.0061
Yellow-billed Cuckoo – YBCU	218	0.9356 ± 0.0157	206	0.9466 ± 0.0157
White-eyed Vireo – WEVI	48	0.7917 ± 0.0586	0	-----
Blue-gray Gnatcatcher – BGGN	44	0.9773 ± 0.0225	0	-----
Yellow-breasted Chat – YBCH	430	0.9582 ± 0.0096	177	0.9548 ± 0.0156
Northern Mockingbird – NOMO	12	0.9167 ± 0.0798	252	0.9284 ± 0.0162
Northern Cardinal –NOCA	250	0.9361 ± 0.0154	236	0.9575 ± 0.0131
Indigo Bunting – INBU	342	0.9532 ± 0.0114	60	0.9500 ± 0.0281
Eastern Towhee – EATO	55	0.9091 ± 0.0388	20	1.0000 ± 0.0000
Dickcissel – DICK	1442	0.9341 ± 0.0065	2658	0.9360 ± 0.0048
Red-winged Blackbird – RWBL	3813	0.9310 ± 0.0041	9054	0.9300 ± 0.0027
Common Grackle – COGR	----	-----	1684	0.9139 ± 0.0068
Orchard Oriole – ORCR	172	0.9650 ± 0.0140	252	0.9604 ± 0.0123



Territory density of birds observed on reforested bottomlands.

Conclusions

Restoration that abutted existing forest accelerated colonization by forest birds but nesting success was similar on reforested sites regardless of their landscape position. Even so, reforested bottomlands were population sinks for 5 species (Mourning Dove, Yellow-breasted Chat, Dickcissel, Red-winged Blackbird, and Common Grackle) but population sources for 5 other species that are more commonly associated with shrub-scrub (Yellow-billed Cuckoo, Northern Cardinal, Indigo Bunting, Northern Mockingbird, and Orchard Oriole). Reforested sites far from existing forest attracted fewer forest and scrub-shrub birds and were population sinks for those species that commonly breed on these sites. Conversely, reforested sites adjacent to mature forest attracted more shrub-scrub and forest dwelling birds and were more likely to be population sources for these species.