

NEOTROPICAL MIGRATORY LANDBIRD USE OF THE ST. FRANCIS NATIONAL FOREST DURING SPRING AND AUTUMN OF 1996

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ABSTRACT

Neotropical migratory landbird (NML) species are declining continentally. However, the relative importance of various habitats for providing the migratory stopover needs of NMLs remains undetermined. Therefore, an investigation of possible relationships between NML relative abundance and stopover habitat should be useful in developing management recommendations to help reverse declining NML populations. The objective of this project is to determine if species composition and migrational volume differ between early-successional habitats in the upland and bottomland of the Mississippi Alluvial Valley. Birds in both habitat types were sampled by mist-netting in the spring and autumn of 1996. For analysis, birds were classified as either NML or other (non-NML). Sixty-five bird species, including 937 individuals, were captured during 29 sampling days in 1996. A significantly ($t = 4.35$, $P = 0.0001$) greater number of NMLs ($\bar{X} = 17.9$ NMLs per sample day; $n = 42$) was recorded than birds of other migratory status ($\bar{X} = 4.67$; $n = 42$). Also, NML species diversity ($\bar{X} = 8.14$ NML species per sample day; $n = 42$) was significantly ($t = 7.45$, $P < 0.0001$) greater than birds of other migratory status ($\bar{X} = 2.14$; $n = 42$). NMLs used both early-successional bottomland and early-successional upland habitats heavily during the spring and fall migration periods. Other data of interest include several records for Yellow-bellied Flycatchers (*Empidonax flaviventris*), Black-throated Green Warblers (*Dendroica virens*), and Gray-cheeked Thrushes (*Catharus minimus*).

INTRODUCTION

Analyses of breeding bird censuses show population declines for various Neotropical migratory landbird (NML) species (James et al. 1992). Most current research investigating these declines focuses on the reproduction period in North America and on the over-wintering ecology during the non-breeding season in the tropics (Hagan et al. 1992; Witham and Hunter 1992). However, the habitat requirements of NMLs along their annual migration routes are poorly known, and the relative importance

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of different stopover habitats to migrating populations is undetermined (Morris et al. 1994). We suggest that NMLs may have specific habitat requirements when using stopover habitat during migration. If this hypothesis is correct, and these habitat needs cannot be met, then managing for breeding and over-wintering habitats could become of little consequence in altering declining trends in NML populations (Moore and Woodrey 1993).

Whether migrating in spring or fall, finding adequate food and the most clement en route weather requires departure at a time favorable for successful completion of migration (Safriel and Lavee 1988). Many NML species use similar time-windows for initial departure, which seems to result in increased competition for quality stopover habitat, where sufficient food and protection from inclement weather can be found (Loria and Moore 1990).

Although its forests have long been considered to be critical NML stopover habitat in the Mississippi Flyway, current research is lacking for the Mississippi Alluvial Valley (Smith et al. 1993). The key question we address here is: Do species composition and migrational volume differ between early-successional habitats (upland versus bottomland) that are used as stopover sites in the Mississippi Alluvial Valley? Answers could be useful in developing management recommendations that may reverse declining NML populations.

METHODS

Study Areas and Sampling Dates

We sampled in two habitats. They included: (1) an early-successional upland forest (T1N, R4E, S28, SE $\frac{1}{4}$) and (2) a mostly early-successional bottomland forest (T1S, R4E, S8, NE $\frac{1}{4}$).

The early-successional upland habitat was sampled during eight dates in spring and fourteen dates during the fall migratory period: 20, 21, and 28 April; 4, 10, 11, 17, and 18 May; 1, 2, 7, 8, 14, 15, 21, 22, 28, and 29 September; and 5, 6, 12, and 13 October. This site was a five-year old clear-cut adjacent to a mature hardwood stand. Common plant species included: Red Mulberry (*Morus rubra*), Southern Sugar Maple (*Acer barbatum*), elm (*Ulmus* spp.), and Trumpet Creeper (*Campsis radicans*) (Thomas 1996).

The mostly early-successional bottomland habitat was sampled during six dates in spring and fourteen dates during the fall migratory period: 13, 14, and 27 April; 5, 12, and 15 May; 31 August; 1, 7, 8, 14, 15, 21, 22, 28, and 29 September; and 5, 6, 12, and 13 October. This site consisted of a seasonally-flooded, forested habitat adjacent to a mature hardwood stand situated on the Mississippi River. It had been disturbed by the presence of a riverside road and wildlife food plot. Common plant species included:

Paw Paw (*Asimina triloba*), oak (*Quercus* spp.), Sycamore (*Plantanus occidentalis*), and Sweet Gum (*Liquidambar styraciflua*) (Thomas 1996).

An equivalent of ten 12.8-m nylon (50 denier/2 ply) mist nets (3.85-cm mesh size) per site was usually used to sample birds. Twenty nets were used in the spring at the bottomland site, when we placed ten nets along the riverside road, in addition to using ten nets in the food plot. During the fall, we only operated ten nets in the food plot at the bottomland site. Nets were located in edge situations in both upland and bottomland early-successional habitats to maximize probability of bird captures. Nets were erected in the respective study habitat locations on the evening prior to the first day of sampling, and were collapsed and rolled after initial placement. Nets were unrolled and opened by 15 minutes before sunrise on sample days. All nets were inspected at approximately 30-minute intervals, with captured birds being removed to a central processing station. Birds were then banded, and measurements were taken. Data recorded included wing chord, mass, and age assessment following Pyle *et al.* (1987). Nets were operated until approximately mid-day when either bird-capture frequency slowed substantially and/or the rising heat of the day could stress birds.

For each sampling day at each site, the number of net-hours was calculated after subtracting the median time between the opening of the first net and the last net from the median of the closing of the first net and the last net. This time interval measured in hours was multiplied by the number of nets used, thereby, calculating total net-hours per site per day. Data are reported in terms of birds captured per 10 net-hours.

During the spring, sites were not sampled simultaneously. Usually, each site was sampled every other weekend, except during late spring, when flooding by the Mississippi River precluded sampling of the bottomland site. During the autumn, both sites were sampled simultaneously, beginning an effort to optimize comparisons between upland and bottomland habitats.

For analysis regarding migratory status, each species captured was classified as (1) NML or (2) other (non-NML). More detailed classifications not used in analysis, but shown in Appendix 1, included: (1) migrant/breeder (M/B) — NML species that breed within the St. Francis National Forest area; (2) migrant (M) — (a) NML species not known to breed in the study area and (b) Nearctic migratory species (*e.g.*, White-throated Sparrow [*Zonotrichia albicollis*]) that winter in the study area, but breed in northern North America); and (3) resident (R) — present year round. Classifications according to migratory status were based on nesting distribution and other information provided by James and Neal (1986).

RESULTS AND DISCUSSION

Species Composition and Relative Abundance

A total of 65 bird species (937 individuals excluding recaptures) was captured in 1996 during 29 sampling days (upland site = 22 sample days; bottomland site = 20 sample days) in 1996 (Appendix 1). We captured 54 species in the upland site and 53 species in the bottomland site. In all, the two habitats shared 42 species. We captured a significantly ($t = 4.35$, $P = 0.0001$) greater number of NMLs ($\bar{X} = 17.9$ NMLs per sample day; $n = 42$) than birds of other migratory status ($\bar{X} = 4.67$; $n = 42$; Tables 1-2; Appendices 2-45). Also, a significantly ($t = 8.14$, $P < 0.0001$) greater number of bird species captured were NMLs ($\bar{X} = 8.14$ NML species per sample day; $n = 42$) rather than bird species of other migratory status ($\bar{X} = 2.14$; $n = 42$; Tables 1-2; Figures 2-5; Appendices 4-45).

During the spring, we captured 56 bird species (543 individuals excluding recaptures; Appendix 1) during 14 sampling days (Table 1; Appendices 2-3). We captured 43 species in the upland site and 44 species in the bottomland. In all, the two habitats shared 31 species (Appendix 1). A significantly ($t = 2.75$, $P = 0.016$) greater number of individual birds were NMLs ($\bar{X} = 30.1$; $n = 14$) rather than birds of other migratory status ($\bar{X} = 8.71$; $n = 14$; Table 1; Figure 1; Appendices 4-17). In addition, a significantly ($t = 4.88$, $P = 0.0002$) greater number of bird species were NMLs ($\bar{X} = 11.29$; $n = 14$) rather than bird species of other migratory status ($\bar{X} = 3.07$; $n = 14$; Table 1; Figures 2-3; Appendices 4-17). The most commonly captured NML species in the upland (27 captures; 12.6% of total spring captures) and the bottomland (71 captures; 21.6% of total spring captures; Table 1; Appendices 2-3) was the Indigo Bunting (*Passerina cyanea*).

During the autumn, we captured 46 bird species (394 individuals excluding recaptures; Appendix 1) during 14 sampling days (Table 2; Appendices 2-3). We captured 38 species in the upland site and 32 species in the bottomland. In all, the two habitats shared 24 species (Appendix 1). A significantly ($t = 6.45$, $P < 0.0001$) greater number of individual birds were NMLs ($\bar{X} = 11.82$; $n = 28$) rather than birds of other migratory status ($\bar{X} = 2.64$; $n = 28$; Table 1; Figures 4-5; Appendices 18-45). In addition, a significantly ($t = 6.93$, $P < 0.0001$) greater number of bird species were NMLs ($\bar{X} = 6.57$; $n = 28$) per sample day rather than bird species of other migratory status ($\bar{X} = 1.68$; $n = 28$; Table 2; Figures 4-5; Appendices 18-45). The most commonly captured NML species in the upland (22 captures; 13.6% of total autumn captures; Table 2; Appendix 2) was the White-eyed vireo (*Vireo griseus*). The most commonly captured species in the bottomland (Table 2; Appendix 3) was the Indigo Bunting (64 captures; 34.2% of total autumn captures).

Phenology of Migration

During the spring, while we were still working the two sites alternately (not simultaneously as in the autumn), we mist-netted at the bottomland as our first site of the season on 13 April. At that point, we recorded a NML capture rate of 0.4 birds per 10 net-hours (Appendix 12). The capture rate at this site peaked on 5 May at 9.0 NMLs per 10 net-hours (Appendix 15). By 15 May, we were still capturing migrants at a relatively high capture rate of 4.1 NMLs per 10 net-hours (Appendix 17). However, the site then became inundated by flooding from the Mississippi River, and we were forced to abandon the bottomland for the balance of the season. Early bottomland arrivals during the spring included the Ruby-throated Hummingbird (*Archilochis colubris*) and the White-eyed vireo (Appendix 3). Late bottomland arrivals included the Acadian Flycatcher (*Empidonax virescens*) and the Magnolia Warbler (*Dendroica magnolia*; Appendix 3).

We began sampling the upland site in the spring on 20 April and observed a capture rate of 2.4 NMLs per 10 net-hours (Appendix 4). On 21 April, we had the heaviest upland capture rate (8.0 NMLs per 10 net-hours; Appendix 5). This peak continued with only slight reduction on 28 April (6.5 NMLs per 10 net-hours; Appendix 6) and 4 May (5.2 NMLs per 10 net-hours; Appendix 7). By 18 May, the capture rate had dropped to 1.5 NMLs per 10 net-hours (Appendix 11). Therefore, we terminated all mist-netting efforts for the spring. Early upland arrivals during the spring included the Kentucky Warbler (*Oporornis formosus*) and the Wood Thrush (*Hylocichla mustelina*; Appendix 2). Late upland arrivals included the Acadian Flycatcher (*Empidonax virescens*) and the Magnolia Warbler (*Dendroica magnolia*; Appendix 2).

During autumn, we began to sample the bottomland and upland sites simultaneously (Figures 4-5; Appendices 18-45). On 1 September, the capture rate for the upland was 2.0 NMLs per 10 net-hours (Appendix 19) and 2.6 NMLs per 10 net-hours for the bottomland (Appendix 33). The upland capture rate peaked on 14 September at 5.7 NMLs per 10 net-hours (Appendix 22), and the bottomland capture rate peaked on 21 September at 4.5 NMLs per 10 net-hours (Appendix 38). By 13 October, the capture rates for both sites had declined to 0.8 NMLs per 10 net-hours (Appendices 31 and 45). Early upland captures during the autumn included the Kentucky Warbler and the Worm-eating Warbler (*Helminthos vermivorus*; Appendix 2). Late upland captures included the Philadelphia Vireo (*Vireo philadelphicus*) and the Chestnut-sided Warbler (*Dendroica pensylvanica*; Appendix 2). Early bottomland captures during the autumn included the Yellow-bellied Flycatcher (*Empidonax flaviventris*) and the Swainson's Warbler (*Limnothlypis swainsonii*; Appendix 3). Late bottomland captures included the Ovenbird (*Seiurus aurocapillus*) and the American Redstart (*Setophaga ruticilla*; Appendix 3).

Data collected during 1996 added to known information about migration in Arkansas for several NML species. Records of importance included observations of

Yellow-bellied Flycatchers (*Empidonax flaviventris*), Black-throated Green Warblers (*Dendroica virens*), and Gray-cheeked Thrushes (*Catharus minimus*).

James and Neal (1986) state that very few autumn reports exist for the Yellow-bellied Flycatcher in Arkansas between the second week of August and the middle of October. All of these reports involved single birds, except for two found at Winslow on 13 October (James and Neal 1986). We captured 13 Yellow-bellied Flycatchers (12 in the upland; 1 in the bottomland) between 1 September and 21 September (Appendix 2). In the upland, five individuals were captured on 1 September, and four individuals were captured on 7 September. All others were single-bird captures. No Yellow-bellied Flycatchers were captured in the spring.

During autumn, sightings of ten Black-throated Green Warblers in Washington County on 2 October, and seven Black-throated Green Warblers near Pine Bluff on 5 October, represent peak numbers for Arkansas (James and Neal 1986). We captured five individuals in the upland on 6 October (Appendix 2). We did not capture Black-throated Green Warblers in the spring.

Previously, there had been only four autumn records for the Gray-cheeked Thrush in Arkansas, and each record represented a single bird (James and Neal 1986). Gray-cheeked Thrushes are not known to sing during autumn migration, making sightings of them difficult. We captured five individuals in the upland between 7 September and 12 October (Appendix 2). Two individuals were captured on 22 September, and the other three were single-bird captures.

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LITERATURE CITED

- JAMES, D. A., AND J. C. NEAL. 1986. Arkansas birds: their distribution and abundance. University of Arkansas Press, Fayetteville, AR, USA.
- LORIA, D. E., and F. R. MOORE. 1990. Energy demands of migration on Red-eyed Vireos, *Vireo olivaceus*. Behavioral Ecology 1:24-35.

- MOORE, F. R., AND M. S. WOODREY. 1993. Stopover habitat and its importance in the conservation of landbird migrants. *Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies* 47: 447-59.
- MORRIS, S. R., M. E. RICHMOND, and D. W. HOLMES. 1994. Patterns of stopover by warblers during spring and fall migration on Appledore Island, Maine. *Wilson Bull.* 106(4):703-718.
- SAFRIEL, U. N., and D. LAVEE. 1988. Weight changes of cross desert migrants—do energetic considerations alone determine the length of stopover? *Oecologia* 76:611-619.
- SMITH, W. P., P. B. HAMEL, AND R. P. FORD. 1993. Mississippi Alluvial Valley forest conversion: implications for eastern North American avifauna. *Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies* 47:460-469.
- THOMAS, G. R. 1996. Different responses of migrating birds to two Mississippi Alluvial valley stopover sites: early-successional upland and early-successional bottomland. Arkansas State University, State University, AR., USA. 24 p. [Internet]. [cited 2009 May18]. Available from: http://ecospectra.com/lib_reports_memos.htm.
- WITHAM, J. W., and M. L. HUNTER, JR. 1992. Population trends of Neotropical migrant landbirds in northern coastal New England. Pages 85-95 in J. M. Hagan, III, and D. W. Johnston, editors. *Ecology and conservation of Neotropical migrant landbirds*. Smithsonian Institution Press, Washington, D. C., USA.

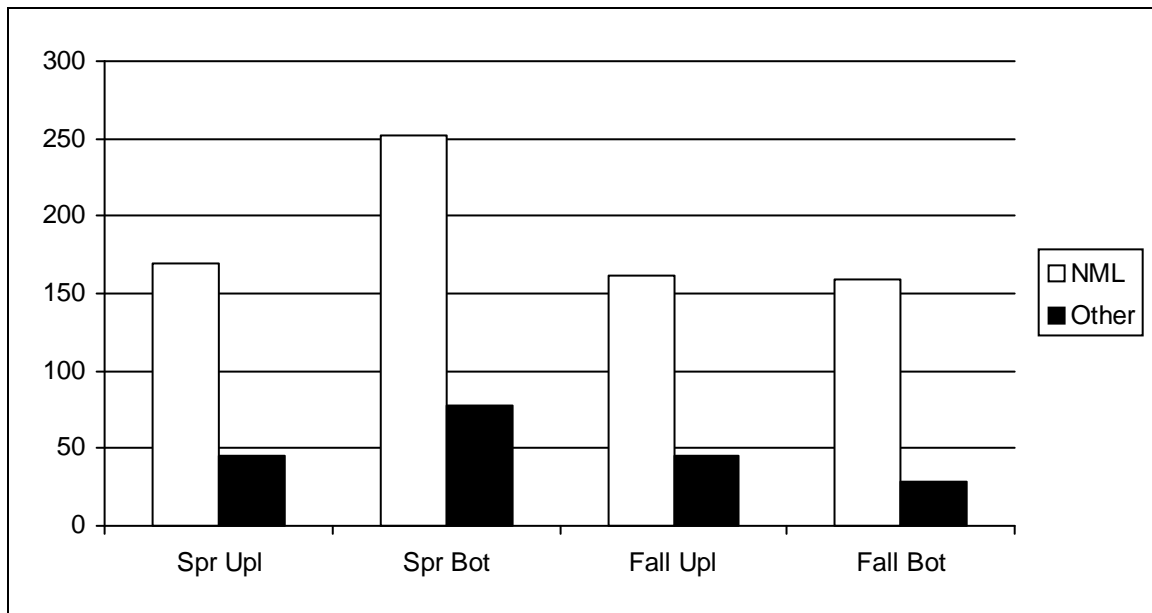


Figure 1. Neotropical migratory landbird (NML) captures versus captures of bird species in other migratory status classes (*i.e.*, resident, Nearctic migrant) in an upland early-successional habitat (Upl) and a bottomland early-successional habitat (Bot). Sampling was done in the St. Francis National Forest during the 1996 spring (Spr) and autumn (Fall) migration periods. Recaptures are not shown.

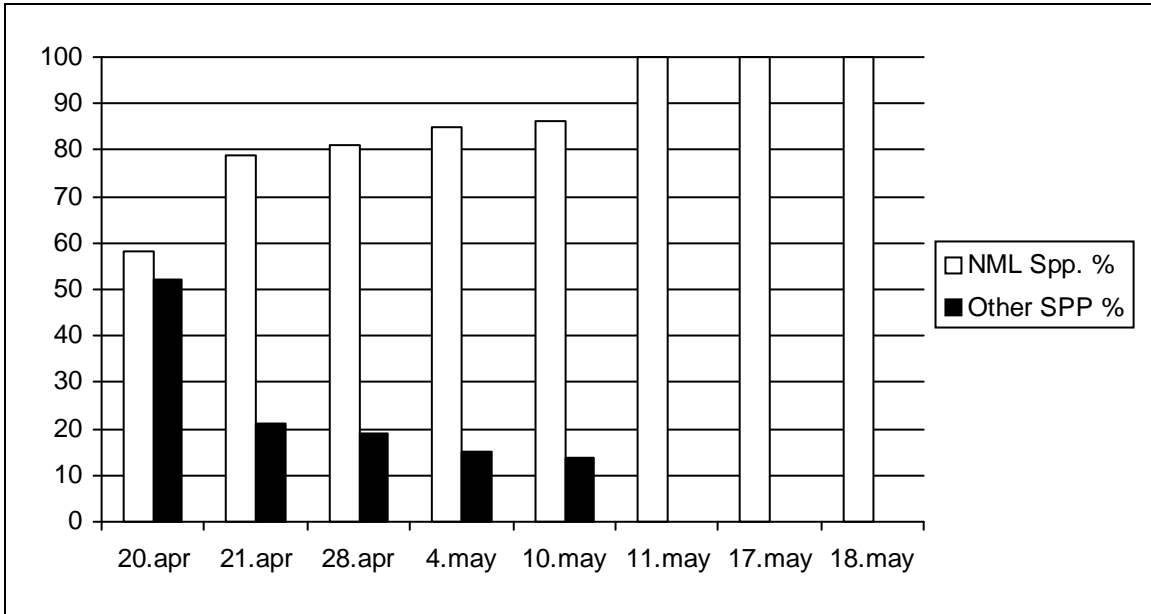


Figure 2. Percentages of Neotropical migratory landbird (NML) species versus percentages of bird species in other migratory status classes during mist-netting surveys in an upland early-successional habitat during the 1996 spring migration period. Recaptures are not shown.

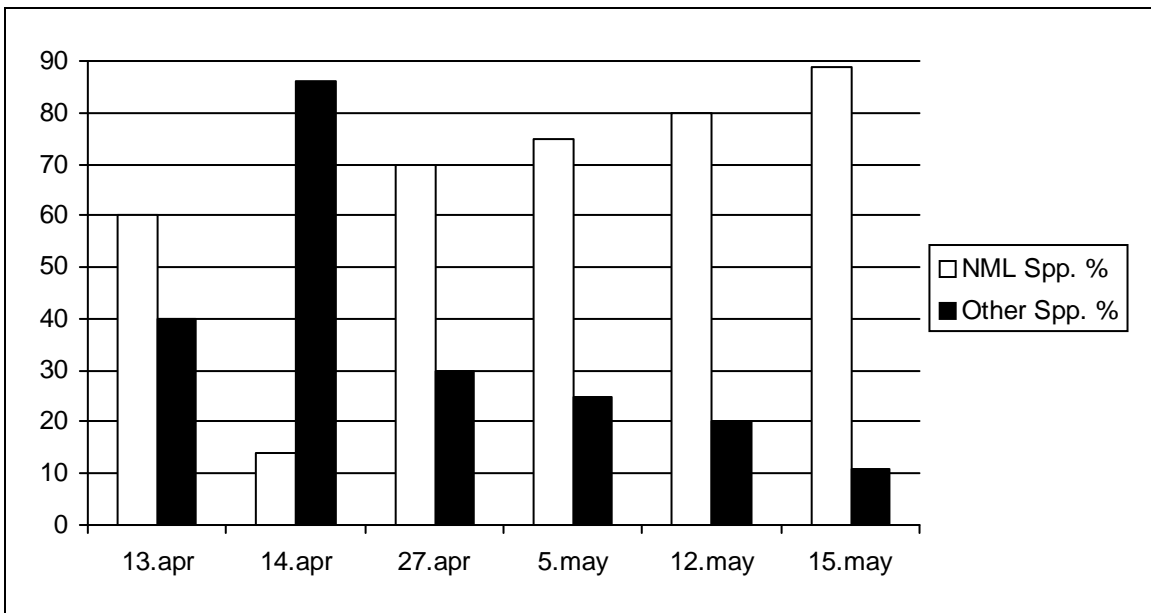


Figure 3. Percentages of Neotropical migratory landbird (NML) species captured versus percentages of bird species in other migratory classes captured during mist-netting surveys in a bottomland early-successional habitat during the 1996 spring migration period. Recaptures are not shown.

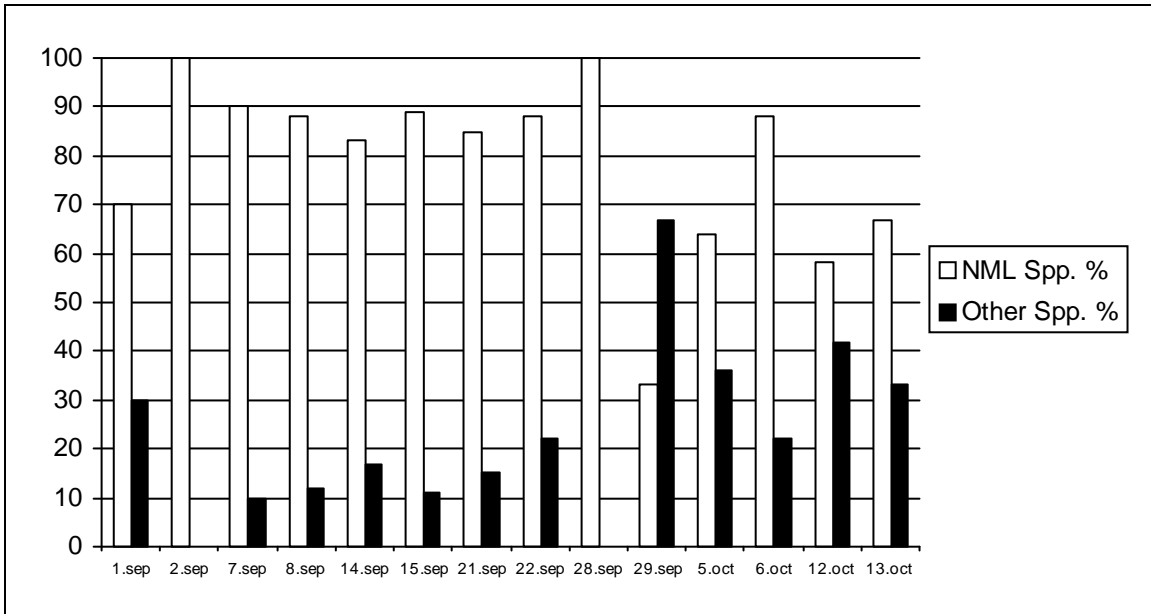


Figure 4. Percentages of Neotropical migratory landbird (NML) species captured versus percentages of bird species in other migratory classes captured during mist-netting surveys in an upland early-successional habitat during the 1996 autumn migration period. Recaptures are not shown.

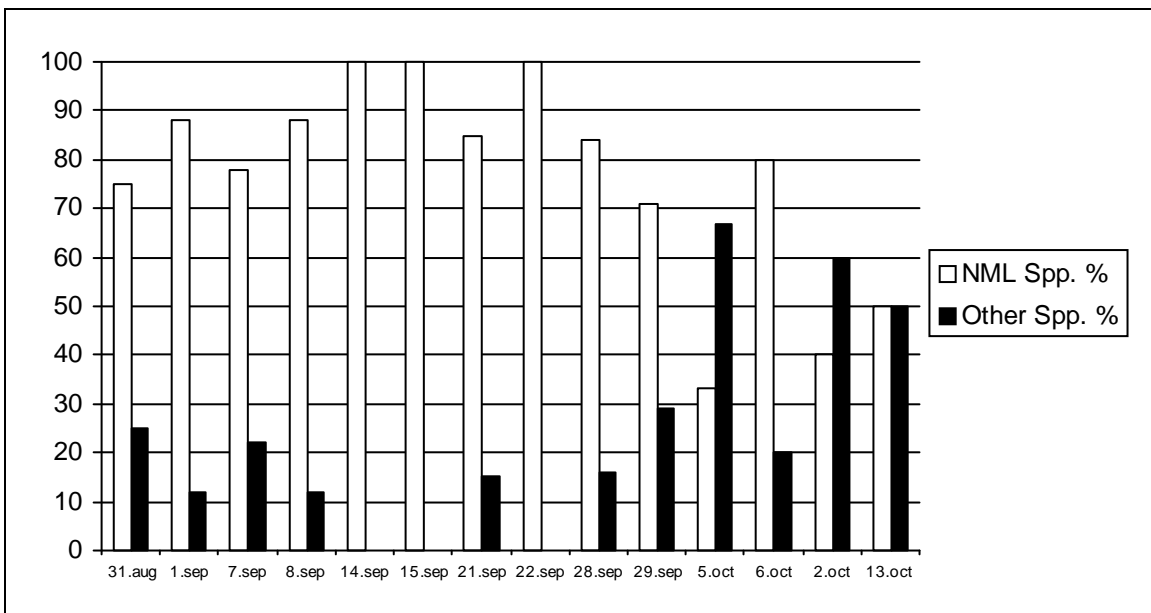


Figure 5. Percentages of Neotropical migratory landbird (NML) species captured versus percentages of other bird species captured during mist-netting surveys in a bottomland early-successional habitat during the 1996 autumn migration period. Recaptures are not shown.

Table 1. Comparison mist-net sampling in early-successional stage upland (8 sample days: 20 April — 18 May 1996) and bottomland forests (6 sample days; 13 April — 15 May 1996) in the St. Francis National Forest. Migrant includes all migratory landbirds. NML includes only Neotropical migratory landbirds.

| | Upland Forest | Bottomland Forest |
|--|------------------|----------------------|
| Total captures | 214.0 | 329.0 |
| Total net-hours | 405.0 | 670.0 |
| Mean total capture rate per 10 net-hours | 5.3 | 4.9 |
| Mean migrant capture rate per 10 net-hours | 4.2 | 3.8 |
| Migrant capture percentage (%) in sample | 79.0 | 76.6 |
| Total number of species in sample | 42.0 | 44.0 |
| Percentage of NML species in sample | 81.8 | 71.4 |

Table 2. Comparison mist-net sampling in early-successional stage upland (14 sample days: 1 September — 13 October 1996) and bottomland forests (13 sample days; 31 August — 13 October 1996) in the St. Francis National Forest. Migrant includes all migratory landbirds. NML includes only Neotropical migratory landbirds.

| | Upland Forest | Bottomland Forest |
|--|------------------|----------------------|
| Total captures | 207.0 | 187.0 |
| Total net-hours | 590.0 | 655.0 |
| Mean total capture rate per 10 net-hours | 3.5 | 2.9 |
| Mean migrant capture rate per 10 net-hours | 2.7 | 2.4 |
| Migrant capture percentage (%) in sample | 78.3 | 85.0 |
| Total number of species in sample | 37.0 | 32.0 |
| Percentage of NML species in sample | 72.2 | 78.8 |

Appendix 1. Species captured during mist-netting surveys in edge situations in an upland early-successional habitat and a bottomland early-successional habitat in the St. Francis National Forest during the 1996 spring and autumn migration periods.

| Species | Migratory Status ² | Season Captured ¹ | |
|---|-------------------------------|------------------------------|------------|
| | | Spring | Autumn |
| Yellow-billed Cuckoo (<i>Coccyzus americanus</i>) | M/B | | <i>b</i> |
| Ruby-throated Hummingbird (<i>Archilochus colubris</i>) | M/B | <i>b</i> | |
| Hairy Woodpecker (<i>Picoides villosus</i>) | R | <i>b</i> | |
| Downy Woodpecker (<i>Picoides pubescens</i>) | R | | <i>u/b</i> |
| Eastern Wood-Pee-wee (<i>Contopus virens</i>) | M/B | <i>u/b</i> | <i>u</i> |
| Yellow-bellied Flycatcher (<i>Empidonax flaviventris</i>) | M | | <i>u/b</i> |
| Acadian Flycatcher (<i>Empidonax virescens</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Least Flycatcher (<i>Empidonax minimus</i>) | M | <i>b</i> | <i>u</i> |
| Blue Jay (<i>Cyanocitta cristata</i>) | R | <i>b</i> | <i>u</i> |
| Eastern Tufted Titmouse (<i>Parus bicolor</i>) | R | <i>b</i> | <i>u/b</i> |
| Carolina Chickadee (<i>Parus carolinensis</i>) | R | <i>u/b</i> | <i>u</i> |
| Carolina Wren (<i>Thryothorus ludovicianus</i>) | R | <i>u/b</i> | <i>u/b</i> |
| House Wren (<i>Troglodytes aedon</i>) | M | <i>b</i> | |
| Sedge Wren (<i>Cistothorus platensis</i>) | M/B | | <i>u</i> |
| Golden-crowned Kinglet (<i>Regulus satrapa</i>) | M | | <i>u</i> |
| Ruby-crowned Kinglet (<i>Regulus calendula</i>) | M | | <i>b</i> |
| Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>) | M/B | <i>b</i> | <i>u</i> |
| Veery (<i>Catharus fuscescens</i>) | M | <i>u/b</i> | |
| Gray-cheeked Thrush (<i>Catharus minimus</i>) | M | <i>u/b</i> | <i>u</i> |
| Swainson's Thrush (<i>Catharus ustulatus</i>) | M | <i>u/b</i> | <i>u/b</i> |
| Hermit Thrush (<i>Catharus guttatus</i>) | M | <i>u</i> | <i>b</i> |

¹ *u* = upland capture; *b* = bottomland capture.

² M = Migrant (includes Nearctic and Neotropical); B = Breeder (St. Francis Natl. Forest); R = Resident (year-round in St. Francis Natl. Forest).

Appendix 1 continued.

| Species | Migratory Status ² | Season Captured ¹ | |
|--|----------------------------------|------------------------------|------------|
| | | Spring | Autumn |
| Wood Thrush (<i>Hylocichla mustelina</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Gray Catbird (<i>Dumetella carolinensis</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Brown Thrasher (<i>Toxostoma rufum</i>) | R | <i>b</i> | <i>u/b</i> |
| White-eyed Vireo (<i>Vireo griseus</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Philadelphia Vireo (<i>Vireo philadelphicus</i>) | M | <i>u/b</i> | <i>u</i> |
| Red-eyed Vireo (<i>Vireo olivaceus</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Blue-winged Warbler (<i>Vermivora pinus</i>) | M | <i>u</i> | |
| Golden-winged Warbler (<i>Vermivora chrysoptera</i>) | M | <i>u/b</i> | |
| Tennessee Warbler (<i>Vermivora peregrina</i>) | M | <i>u</i> | <i>u</i> |
| Northern Parula (<i>Parula americana</i>) | M/B | | <i>b</i> |
| Chestnut-sided Warbler (<i>Dendroica pensylvanica</i>) | M | <i>u</i> | <i>u</i> |
| Magnolia Warbler (<i>Dendroica magnolia</i>) | M | <i>u/b</i> | <i>u/b</i> |
| Yellow-rumped Warbler (<i>Dendroica coronata</i>) | M | <i>b</i> | |
| Black-throated Green Warbler (<i>Dendroica virens</i>) | M | | <i>u</i> |
| Blackburnian Warbler (<i>Dendroica fusca</i>) | M | <i>u/b</i> | |
| Bay-breasted Warbler (<i>Dendroica castanea</i>) | M | <i>u</i> | <i>u</i> |
| Black-and-White Warbler (<i>Mniotilta varia</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| American Redstart (<i>Setophaga ruticilla</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Prothonotary Warbler (<i>Protonotaria citrea</i>) | M/B | <i>u/b</i> | <i>b</i> |

¹ *u* = upland capture; *b* = bottomland capture.² M = Migrant (includes Nearctic and Neotropical); B = Breeder (St. Francis Natl. Forest); R = Resident (year-round in St. Francis Natl. Forest).

Appendix 1 continued.

| Species | Migratory Status ² | Season Captured ¹ | |
|---|-------------------------------|------------------------------|------------|
| | | Spring | Autumn |
| Worm-eating Warbler (<i>Helmintheros vermivorus</i>) | M | <i>u</i> | <i>u/b</i> |
| Swainson's Warbler (<i>Limnothlypis swainsonii</i>) | M/B | | <i>b</i> |
| Ovenbird (<i>Seiurus aurocapillus</i>) | M | <i>u/b</i> | <i>u/b</i> |
| Northern Waterthrush (<i>Seiurus noveboracensis</i>) | M | <i>u</i> | <i>u/b</i> |
| Louisiana Waterthrush (<i>Seiurus motacilla</i>) | M | <i>u/b</i> | |
| Kentucky Warbler (<i>Oporornis formosus</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Mourning Warbler (<i>Oporornis philadelphia</i>) | M | <i>u</i> | |
| Common Yellowthroat (<i>Geothlypis trichas</i>) | M/B | <i>u/b</i> | <i>b</i> |
| Hooded Warbler (<i>Wilsonia citrina</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Wilson's Warbler (<i>Wilsonia pusilla</i>) | M | <i>b</i> | |
| Canada Warbler (<i>Wilsonia canadensis</i>) | M | <i>b</i> | <i>u</i> |
| Yellow-breasted Chat (<i>Icteria virens</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Northern Cardinal (<i>Cardinalis cardinalis</i>) | R | <i>u/b</i> | <i>u/b</i> |
| Summer Tanager (<i>Piranga rubra</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Rose-breasted Grosbeak (<i>Pheucticus ludovicianus</i>) | M | <i>u</i> | |
| Blue Grosbeak (<i>Guiraca caerulea</i>) | M/B | <i>u/b</i> | |
| Indigo Bunting (<i>Passerina cyanea</i>) | M/B | <i>u/b</i> | <i>u/b</i> |
| Rufous-sided Towhee (<i>Pipilo erythrophthalmus</i>) | R | <i>u</i> | |
| Chipping Sparrow (<i>Spizella passerina</i>) | R | <i>u</i> | |
| Field Sparrow (<i>Spizella pusilla</i>) | R | <i>u</i> | |
| Swamp Sparrow (<i>Melospiza georgiana</i>) | R | <i>u/b</i> | <i>b</i> |
| White-throated Sparrow (<i>Zonotrichia albicollis</i>) | M | <i>u/b</i> | <i>u/b</i> |

¹ *u* = upland capture; *b* = bottomland capture.² M = Migrant (includes Nearctic and Neotropical); B = Breeder (St. Francis Natl. Forest); R = Resident (year-round in St. Francis Natl. Forest).

Appendix 1 continued.

| Species | Migratory Status ² | Season Captured ¹ | |
|---|-------------------------------|------------------------------|--------|
| | | Spring | Autumn |
| Brown-headed Cowbird (<i>Molothrus ater</i>) | R | <i>u/b</i> | |
| Orchard Oriole (<i>Icterus spurius</i>) | M/B | <i>b</i> | |
| American Goldfinch (<i>Carduelis tristis</i>) | R | <i>b</i> | |

Appendix 2. Total NML captures with inclusive capture dates for mist-net sampling in early-successional upland habitat (T1N, R4E, S28, SE¼) during 1996. Recaptures are not shown.

| Species | Total Captures | | Inclusive Dates | |
|---------------------------|----------------|--------|-----------------|-----------------|
| | Spring | Autumn | Spring | Autumn |
| Eastern Wood-Pee-wee | 2 | 2 | 10 May - 17 May | 14 Sep - 15 Sep |
| Yellow-bellied Flycatcher | | 12 | | 1 Sep - 21 Sep |
| Acadian Flycatcher | 4 | 11 | 28 Apr - 18 May | 1 Sep - 21 Sep |
| Least Flycatcher | | 1 | | 28 Sep |
| Sedge Wren | | 1 | | 12 Oct |
| Blue-gray Gnatcatcher | | 1 | | 28 Sep |
| Veery | 3 | | 10 May - 11 May | |
| Gray-cheeked Thrush | 5 | 5 | 28 Apr - 4 May | 7 Sep - 12 Oct |
| Swainson's Thrush | 12 | 13 | 21 Apr - 11 May | 14 Sep - 6 Oct |
| Hermit Thrush | 1 | | 4 May | |
| Gray Catbird | 8 | 5 | 28 Apr - 17 May | 14 Sep - 5 Oct |
| White-eyed Vireo | 14 | 22 | 20 Apr - 18 May | 1 Sep - 5 Oct |

¹ *u* = upland capture; *b* = bottomland capture.

² M = Migrant (includes Nearctic and Neotropical); B = Breeder (St. Francis Natl. Forest); R = Resident (year-round in St. Francis Natl. Forest).

Appendix 2 continued.

| Species | <u>Total Captures</u> | | <u>Inclusive Dates</u> | |
|------------------------------|-----------------------|--------|------------------------|-----------------|
| | Spring | Autumn | Spring | Autumn |
| Philadelphia Vireo | 1 | 2 | 4 May | 29 Sep - 6 Oct |
| Red-eyed Vireo | 2 | 8 | 21 Apr - 17 May | 8 Sep - 6 Oct |
| Blue-winged Warbler | 2 | | 20 Apr - 21 Apr | |
| Golden-winged Warbler | 1 | | 17 May | |
| Tennessee Warbler | 11 | 1 | 21 Apr - 11 May | 5 Oct |
| Chestnut-sided Warbler | 2 | 2 | 28 Apr - 4 May | 13 Oct |
| Magnolia Warbler | 1 | 3 | 10 May | 22 Sep - 6 Oct |
| Black-throated Green Warbler | | 6 | | 5 Oct - 6 Oct |
| Blackburnian Warbler | 1 | | 4 May | |
| Bay-breasted Warbler | 1 | 1 | 4 May | 6 Oct |
| Black-and-White Warbler | 1 | 4 | 4 May | 1 Sep - 5 Oct |
| American Redstart | 2 | 2 | 10 May - 11 May | 15 Sep - 12 Oct |
| Prothonotary Warbler | 1 | | 20 Apr | |
| Worm-eating Warbler | 7 | 7 | 21 Apr - 18 May | 2 Sep - 29 Sep |
| Ovenbird | 5 | 21 | 28 Apr - 4 May | 7 Sep - 13 Oct |
| Northern Waterthrush | 3 | 1 | 20 Apr - 28 Apr | 14 Sep |
| Louisiana Waterthrush | 1 | | 11 May | |
| Kentucky Warbler | 18 | 5 | 20 Apr - 18 May | 1 Sep - 15 Sep |
| Mourning Warbler | 1 | | 28 Apr | |
| Common Yellowthroat | 1 | | 20 Apr | |
| Hooded Warbler | 14 | 12 | 21 Apr - 17 May | |
| Canada Warbler | | 2 | | 21 Sep - 22 Sep |
| Yellow-breasted Chat | 7 | 3 | 20 Apr - 17 May | 2 Sep - 5 Oct |
| Summer Tanager | 2 | 2 | 28 Apr | 1 Sep - 14 Sep |

Appendix 2 continued.

| Species | <u>Total Captures</u> | | <u>Inclusive Dates</u> | |
|------------------------|-----------------------|--------|------------------------|----------------|
| | Spring | Autumn | Spring | Autumn |
| Rose-breasted Grosbeak | 1 | | 4 May | |
| Blue Grosbeak | 1 | | 28 Apr | |
| Indigo Bunting | 27 | 5 | 20 Apr - 18 May | 2 Sep - 10 Oct |

Appendix 3. Total NML captures with inclusive capture dates for mist-net sampling in early-successional bottomland habitat (T1S, R4E, S8, NE¼) during 1996. Recaptures are not shown.

| Species | <u>Total Captures</u> | | <u>Inclusive Dates</u> | |
|---------------------------|-----------------------|--------|------------------------|-----------------|
| | Spring | Autumn | Spring | Autumn |
| Yellow-billed Cuckoo | | 1 | | 8 Sep |
| Ruby-throated Hummingbird | 9 | | 13 Apr - 15 May | |
| Eastern Wood-Pee-wee | 3 | | 5 May - 12 May | |
| Yellow-bellied Flycatcher | | 1 | | 21 Sep |
| Acadian Flycatcher | 10 | 6 | 5 May - 15 May | 31 Aug - 15 Sep |
| Least Flycatcher | 3 | | 27 Apr - 15 May | |
| Ruby-crowned Kinglet | | 1 | | 13 Oct |
| Blue-gray Gnatcatcher | 5 | | 13 Apr - 12 May | |
| Veery | 1 | | 12 May | |
| Gray-cheeked Thrush | 9 | | 27 Apr - 15 May | |
| Swainson's Thrush | 30 | 1 | 27 Apr - 15 May | 22 Sep |
| Hermit Thrush | | 1 | | 13 Oct |
| Wood Thrush | 2 | 2 | 27 Apr | 28 Sep |
| Gray Catbird | 11 | 14 | 27 Apr - 15 May | 14 Sep - 12 Oct |
| White-eyed Vireo | 8 | 12 | 13 Apr - 15 May | 31 Aug - 6 Oct |

Appendix 3 continued.

| Species | <u>Total Captures</u> | | <u>Inclusive Dates</u> | |
|-------------------------|-----------------------|--------|------------------------|-----------------|
| | Spring | Autumn | Spring | Autumn |
| Philadelphia Vireo | 1 | | 15 May | |
| Red-eyed Vireo | 5 | 1 | 5 May - 12 May | 31 Aug |
| Golden-winged Warbler | 1 | | 27 Apr | |
| Northern Parula | | 1 | | 21 Sep |
| Magnolia Warbler | 4 | 3 | 5 May - 15 May | 14 Sep - 14 Oct |
| Yellow-rumped Warbler | 1 | | 5 May | |
| Blackburnian Warbler | 2 | | 5 May | |
| Black-and-White Warbler | 1 | 2 | 12 May | 31 Aug - 6 Oct |
| American Redstart | 7 | 1 | 5 May - 15 May | 14 Sep |
| Prothonotary Warbler | 2 | 5 | 12 May | 31 Aug - 8 Sep |
| Worm-eating Warbler | | 2 | | 7 Sep - 29 Sep |
| Swainson's Warbler | | 3 | | 31 Aug - 7 Sep |
| Ovenbird | 3 | 4 | 27 Apr - 15 May | 28 Sep - 6 Oct |
| Northern Waterthrush | | 1 | | 14 Sep |
| Louisiana Waterthrush | 1 | | 27 Apr | |
| Kentucky Warbler | 3 | 19 | 27 Apr | 31 Aug - 29 Sep |
| Common Yellowthroat | 2 | 4 | 27 Apr - 5 May | 1 Sep - 22 Sep |
| Hooded Warbler | 1 | 5 | 15 May | 31 Aug - 29 Sep |
| Wilson's Warbler | 1 | | 5 May | |
| Canada Warbler | 1 | | 15 May | |
| Yellow-breasted Chat | 19 | 4 | 27 Apr - 12 May | 1 Sep - 14 Sep |
| Summer Tanager | 8 | 1 | 27 Apr - 12 May | 15 Sep |
| Blue Grosbeak | 1 | | 15 May | |
| Indigo Bunting | 71 | 64 | 21 Apr - 15 May | 31 Aug - 12 Oct |
| Orchard Oriole | 26 | | 27 Apr - 15 May | |

Appendix 4. Mist-net sampling in early-successional stage upland habitat on 20 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 22.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 4.4 |
| Mean NML capture rate per 10 net-hours | 2.4 |
| NML capture percentage (%) of sample | 54.5 |
| Total number of species in sample | 14.0 |
| Percentage (%) of NML species in sample | 57.1 |

Appendix 5. Mist-net sampling in early-successional stage upland habitat on 21 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 57.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 11.4 |
| Mean NML capture rate per 10 net-hours | 8.0 |
| NML capture percentage (%) of sample | 70.2 |
| Total number of species in sample | 14.0 |
| Percentage (%) of NML species in sample | 78.6 |

Appendix 6. Mist-net sampling in early-successional stage upland habitat on 28 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 45.0 |
| Total net-hours | 55.0 |
| Mean total capture rate per 10 net-hours | 8.2 |
| Mean NML capture rate per 10 net-hours | 6.5 |
| NML capture percentage (%) of sample | 80.0 |
| Total number of species in sample | 21.0 |
| Percentage (%) of NML species in sample | 80.1 |

Appendix 7. Mist-net sampling in early-successional stage upland habitat on 4 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 37.0 |
| Total net-hours | 60.0 |
| Mean total capture rate per 10 net-hours | 6.2 |
| Mean NML capture rate per 10 net-hours | 5.2 |
| NML capture percentage (%) of sample | 83.8 |
| Total number of species in sample | 19.0 |
| Percentage (%) of NML species in sample | 84.2 |

Appendix 8. Mist-net sampling in early-successional stage upland habitat on 10 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 21.0 |
| Total net-hours | 47.5 |
| Mean total capture rate per 10 net-hours | 4.4 |
| Mean NML capture rate per 10 net-hours | 3.8 |
| NML capture percentage (%) of sample | 85.7 |
| Total number of species in sample | 14.0 |
| Percentage (%) of NML species in sample | 85.7 |

Appendix 9. Mist-net sampling in early-successional stage upland habitat on 11 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 10.0 |
| Total net-hours | 35.0 |
| Mean total capture rate per 10 net-hours | 2.9 |
| Mean NML capture rate per 10 net-hours | 2.9 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 10. Mist-net sampling in early-successional stage upland habitat on 17 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 14.0 |
| Total net-hours | 55.0 |
| Mean total capture rate per 10 net-hours | 3.3 |
| Mean NML capture rate per 10 net-hours | 3.3 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 9.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 11. Mist-net sampling in early-successional stage upland habitat on 18 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 8.0 |
| Total net-hours | 52.5 |
| Mean total capture rate per 10 net-hours | 1.5 |
| Mean NML capture rate per 10 net-hours | 1.5 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 5.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 12. Mist-net sampling in early-successional stage bottomland habitat on 13 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 10.0 |
| Total net-hours | 90.0 |
| Mean total capture rate per 10 net-hours | 1.1 |
| Mean NML capture rate per 10 net-hours | 0.4 |
| NML capture percentage (%) of sample | 40.0 |
| Total number of species in sample | 5.0 |
| Percentage (%) of NML species in sample | 60.0 |

Appendix 13. Mist-net sampling in early-successional stage bottomland habitat on 14 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 29.0 |
| Total net-hours | 100.0 |
| Mean total capture rate per 10 net-hours | 2.9 |
| Mean NML capture rate per 10 net-hours | 0.2 |
| NML capture percentage (%) of sample | 6.9 |
| Total number of species in sample | 7.0 |
| Percentage (%) of NML species in sample | 14.3 |

Appendix 14. Mist-net sampling in early-successional stage bottomland habitat on 27 April 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 64.0 |
| Total net-hours | 110.0 |
| Mean total capture rate per 10 net-hours | 5.8 |
| Mean NML capture rate per 10 net-hours | 4.2 |
| NML capture percentage (%) of sample | 71.2 |
| Total number of species in sample | 23.0 |
| Percentage (%) of NML species in sample | 69.6 |

Appendix 15. Mist-net sampling in early-successional stage bottomland habitat on 5 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|---|-------|
| Total captures | 119.0 |
| Total net-hours | 120.0 |
| Mean total capture per 10 net-hours | 9.9 |
| Mean NML capture rate per 10 net-hours | 9.0 |
| NML capture percentage (%) of sample | 90.8 |
| Total number of species in sample | 24.0 |
| Percentage (%) of NML species in sample | 75.0 |

Appendix 16. Mist-net sampling in early-successional stage bottomland habitat on 12 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 51.0 |
| Total net-hours | 135.0 |
| Mean total capture rate per 10 net-hours | 3.8 |
| Mean NML capture rate per 10 net-hours | 3.3 |
| NML capture percentage (%) of sample | 86.3 |
| Total number of species in sample | 20.0 |
| Percentage (%) of NML species in sample | 80.0 |

Appendix 17. Mist-net sampling in early-successional stage bottomland habitat on 15 May 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 55.0 |
| Total net-hours | 115.0 |
| Mean total capture rate per 10 net-hours | 4.8 |
| Mean NML capture rate per 10 net-hours | 4.1 |
| NML capture percentage (%) of sample | 85.4 |
| Total number of species in sample | 19.0 |
| Percentage (%) of NML species in sample | 89.4 |

Appendix 18. Mist-net sampling in early-successional stage upland habitat on
1 September 1996 in the St. Francis National Forest. NML = Neotropical migratory
landbird.

| | |
|--|------|
| Total captures | 25.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 5.0 |
| Mean NML capture rate per 10 net-hours | 3.2 |
| NML capture percentage (%) of sample | 64.0 |
| Total number of species in sample | 10.0 |
| Percentage (%) of NML species in sample | 70.0 |

Appendix 19. Mist-net sampling in early-successional stage upland habitat on
2 September 1996 in the St. Francis National Forest. NML = Neotropical migratory
landbird.

| | |
|--|-------|
| Total captures | 3.0 |
| Total net-hours | 15.0 |
| Mean total capture rate per 10 net-hours | 2.0 |
| Mean NML capture rate per 10 net-hours | 2.0 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 3.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 20. Mist-net sampling in early-successional stage upland habitat on 7 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 18.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 3.6 |
| Mean NML capture rate per 10 net-hours | 3.4 |
| NML capture percentage (%) of sample | 94.4 |
| Total number of species in sample | 10.0 |
| Percentage (%) of NML species in sample | 90.0 |

Appendix 21. Mist-net sampling in early-successional stage upland habitat on 8 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 10.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 2.0 |
| Mean NML capture rate per 10 net-hours | 1.8 |
| NML capture percentage (%) of sample | 90.0 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 87.5 |

Appendix 22. Mist-net sampling in early-successional stage upland habitat on 14 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 33.0 |
| Total net-hours | 47.5 |
| Mean total capture rate per 10 net-hours | 6.9 |
| Mean NML capture rate per 10 net-hours | 5.7 |
| NML capture percentage (%) of sample | 81.2 |
| Total number of species in sample | 17.0 |
| Percentage (%) of NML species in sample | 82.3 |

Appendix 23. Mist-net sampling in early-successional stage upland habitat on 15 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 11.0 |
| Total net-hours | 47.5 |
| Mean total capture rate per 10 net-hours | 2.3 |
| Mean NML capture rate per 10 net-hours | 2.1 |
| NML capture percentage (%) of sample | 90.1 |
| Total number of species in sample | 9.0 |
| Percentage (%) of NML species in sample | 88.9 |

Appendix 24. Mist-net sampling in early-successional stage upland habitat on 21 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 21.0 |
| Total net-hours | 45.0 |
| Mean total capture rate per 10 net-hours | 4.7 |
| Mean NML capture rate per 10 net-hours | 4.0 |
| NML capture percentage (%) of sample | 85.7 |
| Total number of species in sample | 13.0 |
| Percentage (%) of NML species in sample | 84.6 |

Appendix 25. Mist-net sampling in early-successional stage upland habitat on 22 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 15.0 |
| Total net-hours | 42.5 |
| Mean total capture rate per 10 net-hours | 3.5 |
| Mean NML capture rate per 10 net-hours | 2.8 |
| NML capture percentage (%) of sample | 80.0 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 87.5 |

Appendix 26. Mist-net sampling in early-successional stage upland habitat on 28 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 12.0 |
| Total net-hours | 42.5 |
| Mean total capture rate per 10 net-hours | 2.8 |
| Mean NML capture rate per 10 net-hours | 2.8 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 7.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 27. Mist-net sampling in early-successional stage upland habitat on 29 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 11.0 |
| Total net-hours | 42.5 |
| Mean total capture rate per 10 net-hours | 2.6 |
| Mean NML capture rate per 10 net-hours | 1.2 |
| NML capture percentage (%) of sample | 45.5 |
| Total number of species in sample | 9.0 |
| Percentage (%) of NML species in sample | 33.3 |

Appendix 28. Mist-net sampling in early-successional stage upland habitat on 5 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 21.0 |
| Total net-hours | 42.5 |
| Mean total capture rate per 10 net-hours | 4.9 |
| Mean NML capture rate per 10 net-hours | 2.1 |
| NML capture percentage (%) of sample | 57.1 |
| Total number of species in sample | 14.0 |
| Percentage (%) of NML species in sample | 64.3 |

Appendix 29. Mist-net sampling in early-successional stage upland habitat on 6 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 15.0 |
| Total net-hours | 40.0 |
| Mean total capture rate per 10 net-hours | 3.8 |
| Mean NML capture rate per 10 net-hours | 3.5 |
| NML capture percentage (%) of sample | 93.3 |
| Total number of species in sample | 8.0 |
| Percentage of NML species in sample | 87.5 |

Appendix 30. Mist-net sampling in early-successional stage upland habitat on
12 October 1996 in the St. Francis National Forest. NML = Neotropical migratory
landbird.

| | |
|--|------|
| Total captures | 8.0 |
| Total net-hours | 37.5 |
| Mean total capture rate per 10 net-hours | 3.0 |
| Mean NML capture rate per 10 net-hours | 1.1 |
| NML capture percentage (%) of sample | 50.0 |
| Total number of species in sample | 7.0 |
| Percentage (%) of NML species in sample | 57.1 |

Appendix 31. Mist-net sampling in early-successional stage upland habitat on
13 October 1996 in the St. Francis National Forest. NML = Neotropical migratory
landbird.

| | |
|--|------|
| Total captures | 4.0 |
| Total net-hours | 37.5 |
| Mean total capture rate per 10 net-hours | 1.1 |
| Mean NML capture rate per 10 net-hours | 0.8 |
| NML capture percentage (%) of sample | 75.0 |
| Total number of species in sample | 3.0 |
| Percentage (%) of NML species in sample | 66.7 |

Appendix 32. Mist-net sampling in early-successional stage bottomland habitat on 31 August 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 32.0 |
| Total net-hours | 107.5 |
| Mean total capture rate per 10 net-hours | 3.0 |
| Mean NML capture rate per 10 net-hours | 2.7 |
| NML capture percentage (%) of sample | 90.1 |
| Total number of species in sample | 12.0 |
| Percentage (%) of NML species in sample | 75.0 |

Appendix 33. Mist-net sampling in early-successional stage bottomland habitat on 1 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 16.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 3.2 |
| Mean NML capture rate per 10 net-hours | 2.6 |
| NML capture percentage (%) of sample | 81.3 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 87.5 |

Appendix 34. Mist-net sampling in early-successional stage bottomland habitat on 7 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 11.0 |
| Total net-hours | 50.0 |
| Mean total capture rate per 10 net-hours | 2.2 |
| Mean NML capture rate per 10 net-hours | 1.8 |
| NML capture percentage (%) of sample | 81.2 |
| Total number of species in sample | 9.0 |
| Percentage (%) of NML species in sample | 77.8 |

Appendix 35. Mist-net sampling in early-successional stage bottomland habitat on 8 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 15.0 |
| Total net-hours | 45.0 |
| Mean total capture rate per 10 net-hours | 3.3 |
| Mean NML capture rate per 10 net-hours | 3.1 |
| NML capture percentage (%) of sample | 93.3 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 87.5 |

Appendix 36. Mist-net sampling in early-successional stage bottomland habitat on 14 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 23.0 |
| Total net-hours | 52.5 |
| Mean total capture rate per 10 net-hours | 4.4 |
| Mean NML capture rate per 10 net-hours | 4.4 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 8.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 37. Mist-net sampling in early-successional stage bottomland habitat on 15 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 8.0 |
| Total net-hours | 37.5 |
| Mean total capture rate per 10 net-hours | 2.1 |
| Mean NML capture rate per 10 net-hours | 2.1 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 6.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 38. Mist-net sampling in early-successional stage bottomland habitat on 21 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 21.0 |
| Total net-hours | 40.0 |
| Mean total capture rate per 10 net-hours | 5.3 |
| Mean NML capture rate per 10 net-hours | 4.5 |
| NML capture percentage (%) of sample | 85.7 |
| Total number of species in sample | 13.0 |
| Percentage (%) of NML species in sample | 84.6 |

Appendix 39. Mist-net sampling in early-successional stage bottomland habitat on 22 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|-------|
| Total captures | 16.0 |
| Total net-hours | 45.0 |
| Mean total capture rate per 10 net-hours | 3.6 |
| Mean NML capture rate per 10 net-hours | 3.6 |
| NML capture percentage (%) of sample | 100.0 |
| Total number of species in sample | 7.0 |
| Percentage (%) of NML species in sample | 100.0 |

Appendix 40. Mist-net sampling in early-successional stage bottomland on 28 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 11.0 |
| Total net-hours | 40.0 |
| Mean total capture rate per 10 net-hours | 2.8 |
| Mean NML capture rate per 10 net-hours | 2.5 |
| NML capture percentage (%) of sample | 90.1 |
| Total number of species in sample | 6.0 |
| Percentage (%) of NML species in sample | 83.3 |

Appendix 41. Mist-net sampling in early-successional stage bottomland habitat on 29 September 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 15.0 |
| Total net-hours | 42.5 |
| Mean total capture rate per 10 net-hours | 3.5 |
| Mean NML capture rate per 10 net-hours | 2.8 |
| NML capture percentage (%) of sample | 80.0 |
| Total number of species in sample | 7.0 |
| Percentage (%) of NML species in sample | 71.4 |

Appendix 42. Mist-net sampling in early-successional stage bottomland habitat on 5 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 3.0 |
| Total net-hours | 32.5 |
| Mean total capture rate per 10 net-hours | 0.9 |
| Mean NML capture rate per 10 net-hours | 0.3 |
| NML capture percentage (%) of sample | 33.3 |
| Total number of species in sample | 3.0 |
| Percentage (%) of NML species in sample | 33.3 |

Appendix 43. Mist-net sampling in early-successional stage bottomland habitat on 6 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 9.0 |
| Total net-hours | 32.5 |
| Mean total capture rate per 10 net-hours | 2.8 |
| Mean NML capture rate per 10 net-hours | 2.5 |
| NML capture percentage (%) of sample | 88.9 |
| Total number of species in sample | 5.0 |
| Percentage (%) of NML species in sample | 80.0 |

Appendix 44. Mist-net sampling in early-successional stage bottomland habitat on 12 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 9.0 |
| Total net-hours | 40.0 |
| Mean total capture rate per 10 net-hours | 2.3 |
| Mean NML capture rate per 10 net-hours | 1.3 |
| NML capture percentage (%) of sample | 55.6 |
| Total number of species in sample | 5.0 |
| Percentage (%) of NML species in sample | 40.0 |

Appendix 45. Mist-net sampling in early-successional stage bottomland habitat on 13 October 1996 in the St. Francis National Forest. NML = Neotropical migratory landbird.

| | |
|--|------|
| Total captures | 9.0 |
| Total net-hours | 40.0 |
| Mean total capture rate per 10 net-hours | 2.3 |
| Mean NML capture rate per 10 net-hours | 0.8 |
| NML capture percentage (%) of sample | 33.3 |
| Total number of species in sample | 6.0 |
| Percentage (%) of NML species in sample | 50.0 |
