



**AVIAN DIVERSITY OF THE PORT LOUISA NATIONAL
WILDLIFE REFUGE**

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Wildlife Refuge*

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***J. A. Spendelow, Peter S. Weber, Fred Fallon, Stuart Tingley, Bob Schuster,
George Jameson, Deanna Dawson, Jim Stasz, Greg Lasley, and Marcus Martin –
Photo Credits***

Overview of Refuge Location



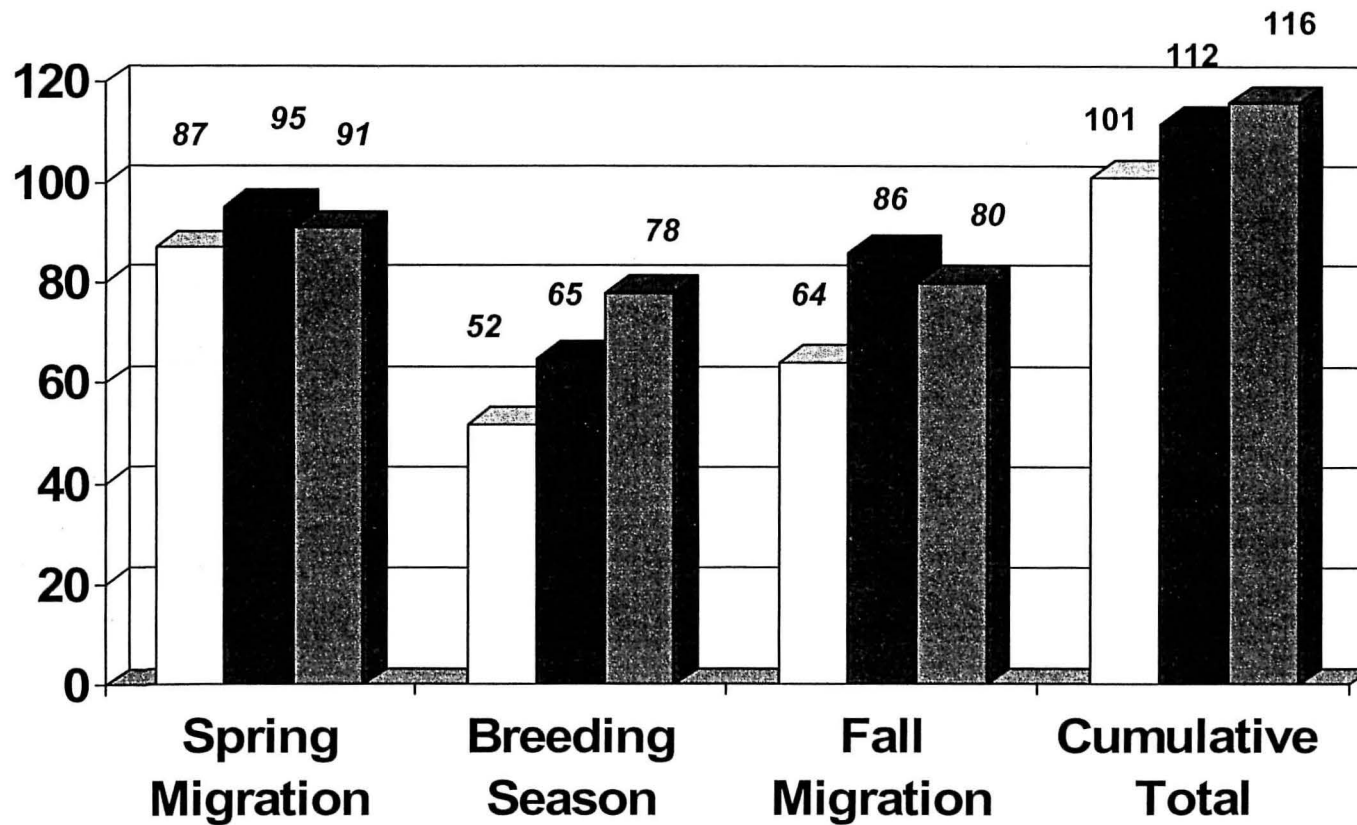
OBJECTIVES

- ***Identify the avian communities present: in floodplain forest habitat on the Big Timber Division, in a backwater complex of wetland/ floodplain forest/ levee grassland habitat on the Keithsburg Division, and in wet meadow and grassland habitat on the Horseshoe Bend Division.***
- ***Determine the relative abundance and frequency of occurrence for bird species found on the different Divisions of the Refuge.***
- ***Evaluate changes in species diversity associated with differences in habitat condition and season of use.***
- ***Compare the 2004 species diversity, relative abundance, and frequency of occurrence with that for data collected in 1994- 96 and identify any changes which have occurred over time.***

Monitoring Methods

- **10 point counts surveyed in each Division.**
- **Each survey station sampled eight times - - late April through mid- May; June and July; and late August through mid- September.**
- **All birds detected were tallied within a 100 meter circular plot for 10 minutes.**
- **Surveys were not conducted during periods of steady precipitation or on days of sustained wind in excess of 15 mph (Ralph et al. 1993). All survey stations were sampled between sunrise and 11:00 AM CDT.**
- **Survey stations are located at least 200 meters apart at Big Timber Division; 500 meters apart at Keithsburg Division; and at least 500 meters apart at Horseshoe Bend Division.**
- **The total number of birds recorded represents the number detected, not the actual number of birds present.**

Total Number of Species Observed



□ Big Timber Division ■ Keithsburg Division ▒ Horseshoe Bend Division

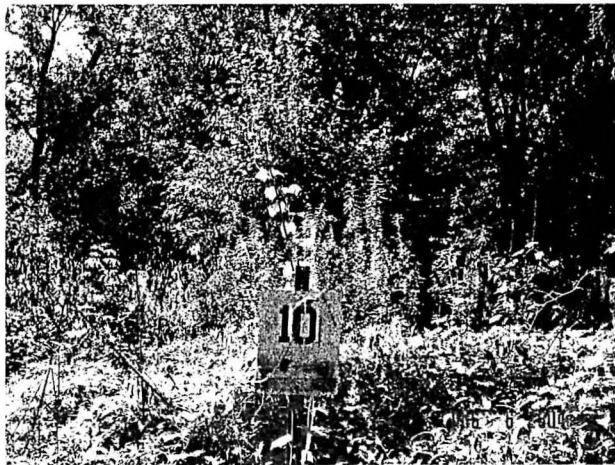
***Big Timber Division
Point Count Sites***



Most Representative of Pre-1993 Flood
Forest Structure



Development of Multi-layered Understory



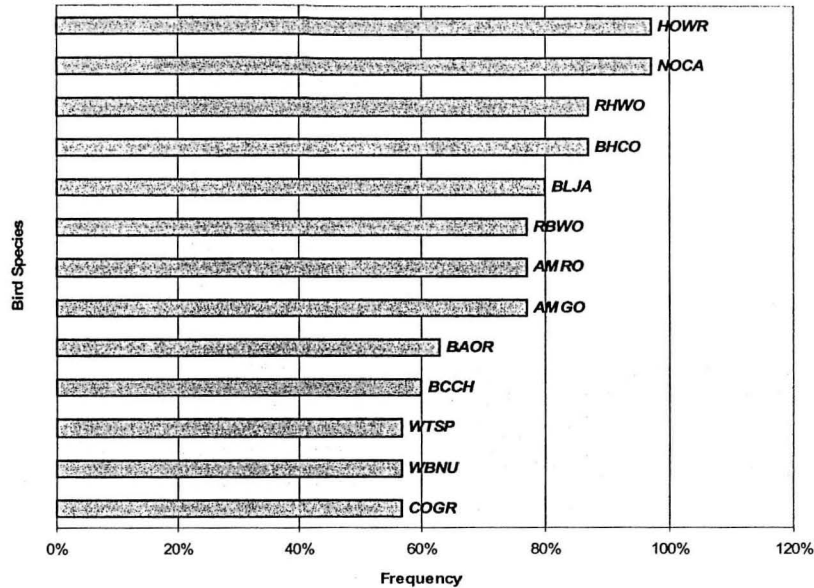
Disturbance Created Openings



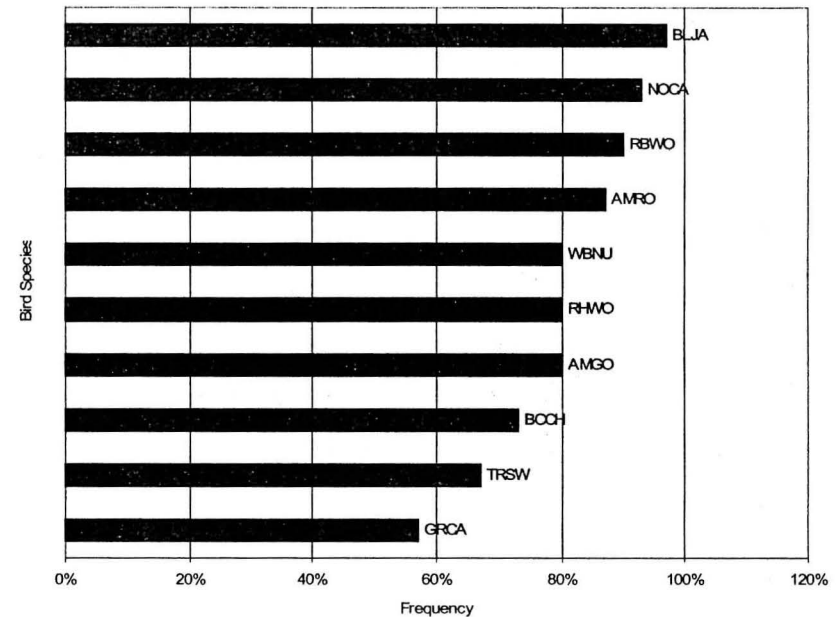
Dense Patches of Red Mulberry Regeneration

Big Timber Division Frequency of Occurrence Results

Most Often Detected Bird Species During the Spring Point Counts -
Big Timber Division



Most Often Detected Bird Species During the Fall Point Counts - Big Timber
Division



Spring Migration vs. Fall Migration Differences:

House Wrens with High Frequency in the Spring are Detected at a Low Frequency in the Fall

Brown-headed Cowbirds Detected at a High Frequency in the Spring were not Present in the Fall

White-throated Sparrows Detected at a Moderate Frequency in the Spring were not Present in the Fall

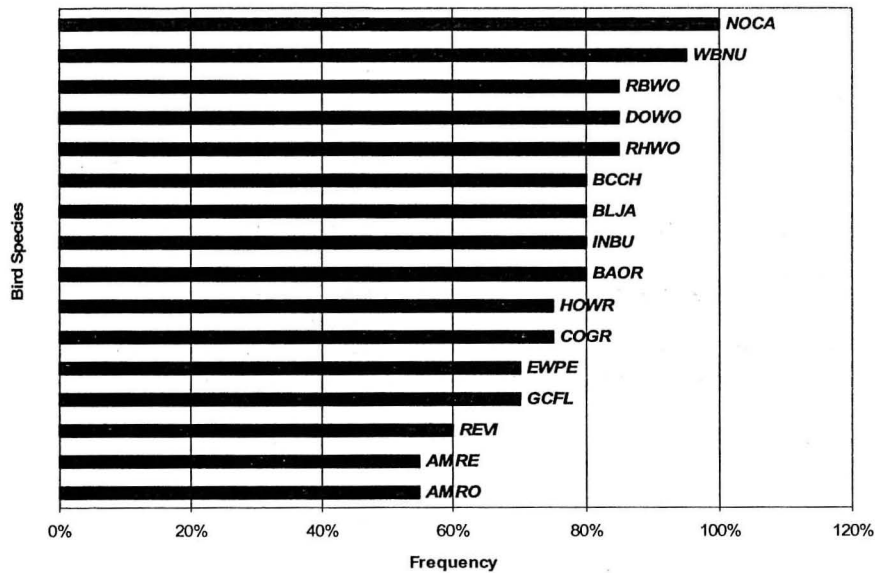
A Higher Frequency of Gray Catbirds in the Fall than in the Spring

Species Only Detected in the Spring Migration: White-throated Sparrow, Alder Flycatcher, White-eyed Vireo, Blue-headed Vireo, Northern Parula, Common Yellowthroat, Northern Waterthrush Eastern Towhee, Golden-crowned Kinglet, Ruby-crowned Kinglet, Veery, Swainson's Thrush, Solitary Sandpiper, Rusty Blackbird, Brewer's Blackbird, and Cape May, Yellow-rumped, Blackburnian, Palm, Blackpoll, Cerulean, and Kentucky Warblers.

Species Only Detected in the Fall Migration: Blue-winged, Golden-winged, and Bay-breasted Warblers, Scarlet Tanager, Barn and Bank Swallows, Red-breasted Nuthatch, Eastern Bluebird, and Great Egret.

Big Timber Division Frequency of Occurrence Results

Most Often Detected Bird Species During the Breeding Season Point Counts - Big Timber Division



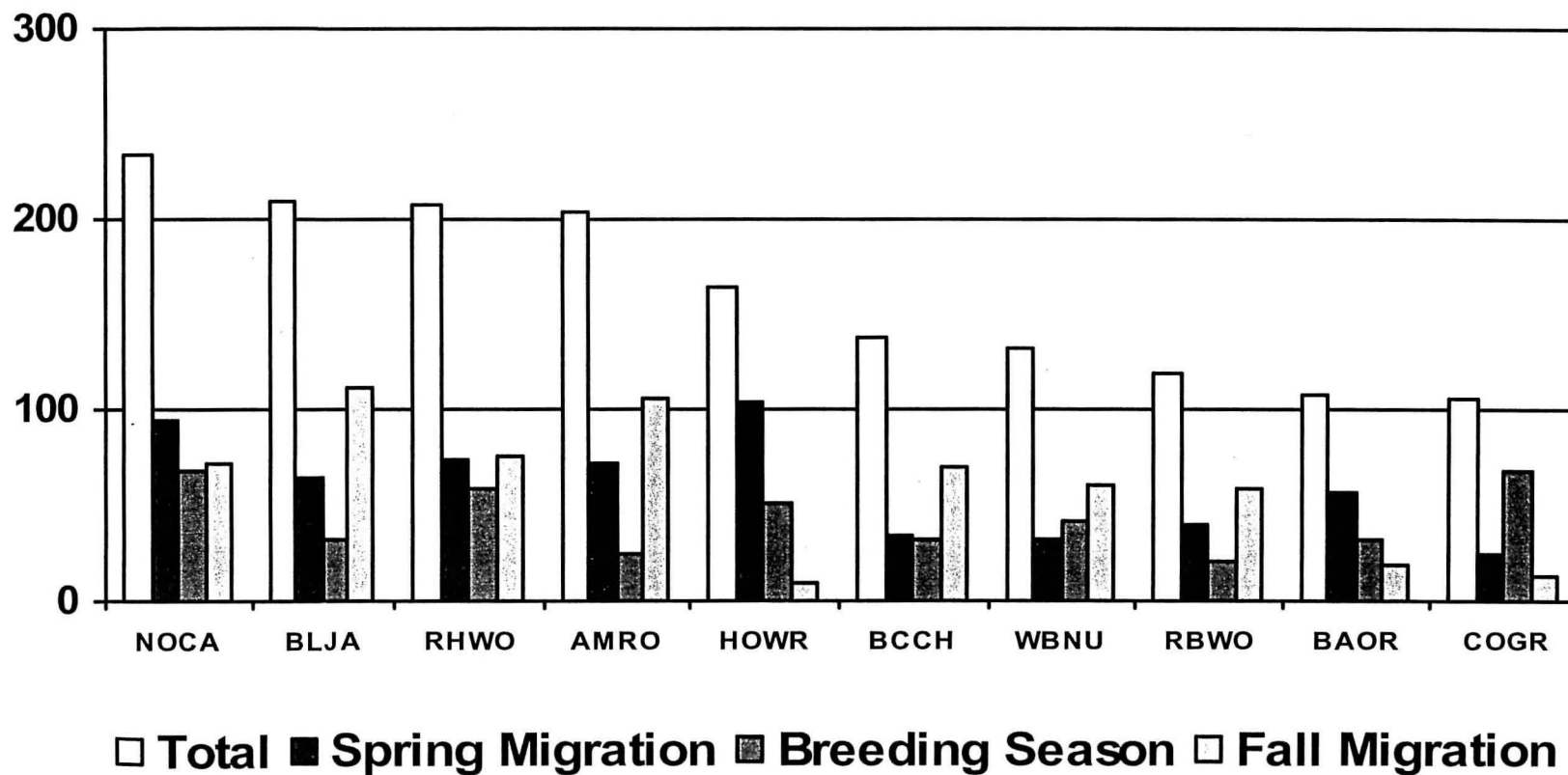
Species Only Detected in the Breeding Season:

- Spotted Sandpiper
- Eastern Phoebe
- Yellow-throated Warbler
- Cliff Swallow

Neotropical Migrants Present (51 species)

- * Yellow-billed Cuckoo
 - * Chimney Swift
 - Ruby-throated Hummingbird
 - Alder Flycatcher
 - * Great Crested Flycatcher
 - Least Flycatcher
 - * Eastern Wood-pewee
 - Least Flycatcher
 - * Baltimore Oriole
 - * Rose-breasted Grosbeak
 - Scarlet Tanager
 - Indigo Bunting
 - Cliff Swallow
 - Bank Swallow
 - Barn Swallow
 - * Northern Rough-winged Swallow
 - * Gray Catbird
 - * House Wren
 - Blue-gray Gnatcatcher
 - Swainson's Thrush
 - * Wood Thrush
 - Veery
 - * Red-eyed Vireo
 - * Warbling Vireo
 - White-eyed Vireo
 - Philadelphia Vireo
 - * Yellow-throated Vireo
 - Cape May Warbler
 - Blue-winged Warbler
 - Golden-winged Warbler
 - Orange-crowned Warbler
 - Tennessee Warbler
 - Nashville Warbler
 - Yellow Warbler
 - Chestnut-sided Warbler
 - Kentucky Warbler
 - Magnolia Warbler
 - * Yellow-throated Warbler
 - Bay-breasted Warbler
 - Palm Warbler
 - Blackpoll Warbler
 - Cerulean Warbler
 - Blackburnian Warbler
 - Black-and-White Warbler
 - * Prothonotary Warbler
 - Northern Waterthrush
 - * American Redstart
 - Wilson's Warbler
 - Canada Warbler
 - * Common Yellowthroat
 - Ovenbird
- * Detected during the nesting season – Likely to be nesting on the Refuge & have produced young.

Relative Abundance Results
(Species with the Greatest Number of Birds Detected)
Big Timber Division



Keithsburg Division Point Count Sites



Linear Juxtaposition of Habitat Adjacent to Mississippi R. in Vicinity of Levee



Periodically Flooded Woodland Stands



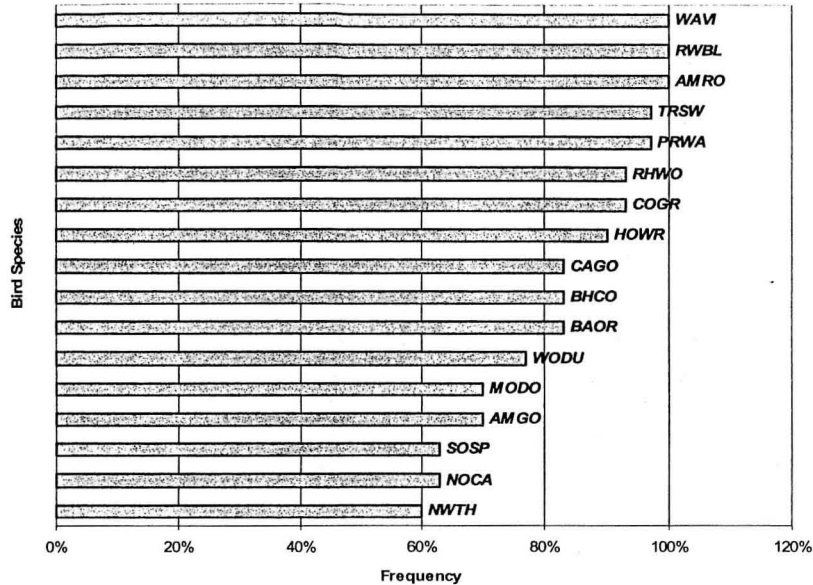
Large Increase in Dead Snags and Downed Woody Debris



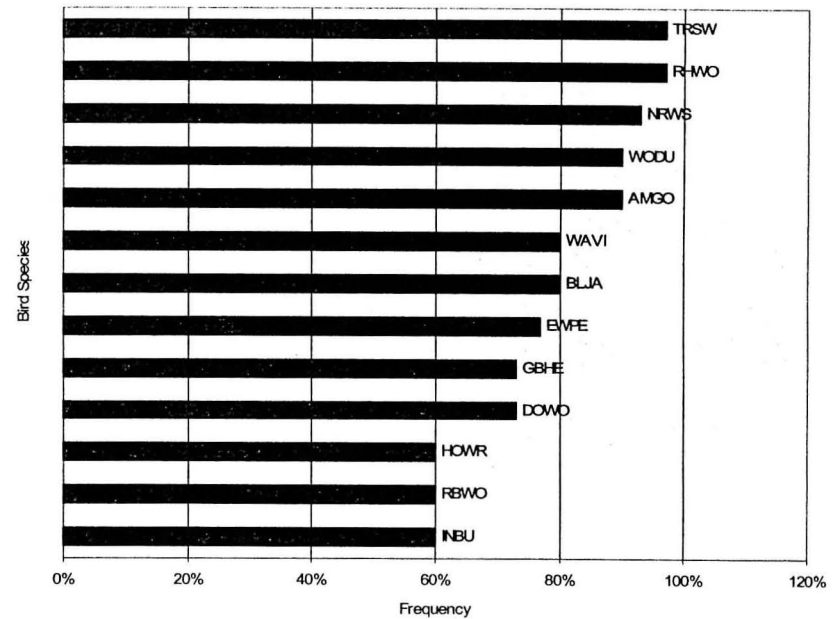
Dense stands of Willow Regeneration

Keithsburg Division Frequency of Occurrence Results

**Most Often Detected Bird Species During the Spring Point Counts -
Keithsburg Division**



**Most Often Detected Bird Species During the Fall Point Counts - Keithsburg
Division**



Large Variation in Spring Migration vs. Fall Migration Species Detection:

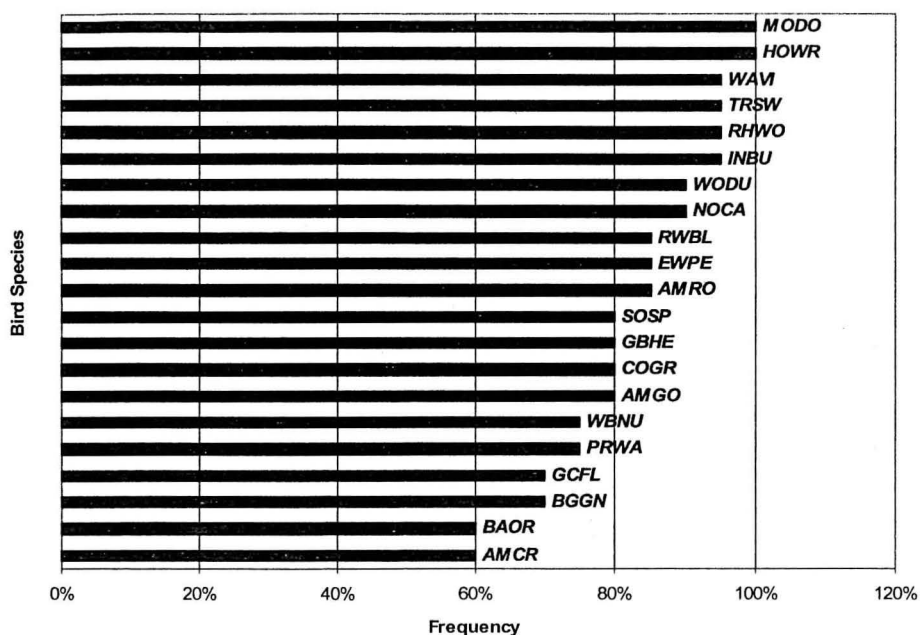
American Robins, Prothonotary Warblers, Baltimore Orioles, and Canada Geese with High Frequency in the Spring and Low Frequency in the Fall
Northern Rough-winged Swallows, Eastern Wood-pewees, and Downy Woodpeckers with Low Frequency in the Spring and High Frequency in the Fall
A Higher Frequency of Red-winged Blackbirds, Common Grackles, Mourning Doves, and Northern Waterthrushes in the Spring than in the Fall
A Higher Frequency of Great Blue Herons, Blue Jays, and Indigo Buntings in the Fall than in the Spring

Species Only Detected in the Spring Migration: White-crowned, Clay-colored, Chipping, and Swamp Sparrows, Alder Flycatcher, Marsh Wren, Black-billed Cuckoo, Nashville, Yellow-rumped, Palm, and Blackpoll Warblers, Belted Kingfisher, Wilson's Phalarope, Lesser Yellowlegs, Wilson's Snipe, Common, Forster's, and Caspian Terns, Hooded Mergansers, and American Coots.

Species Only Detected in the Fall Migration: Blue-winged, Golden-winged, Canada, Black-and-white, and Chestnut-sided Warblers, Scarlet Tanager, White-eyed and Philadelphia Vireos, Red-breasted Nuthatch, Olive-sided and Least Flycatchers, Pectoral Sandpipers, Greater Yellowlegs, Green-winged Teal, and Sharp-shinned Hawk.

Keithsburg Division Frequency of Occurrence Results

Most Often Detected Bird Species During the Breeding Season Point
Counts
Keithsburg Division



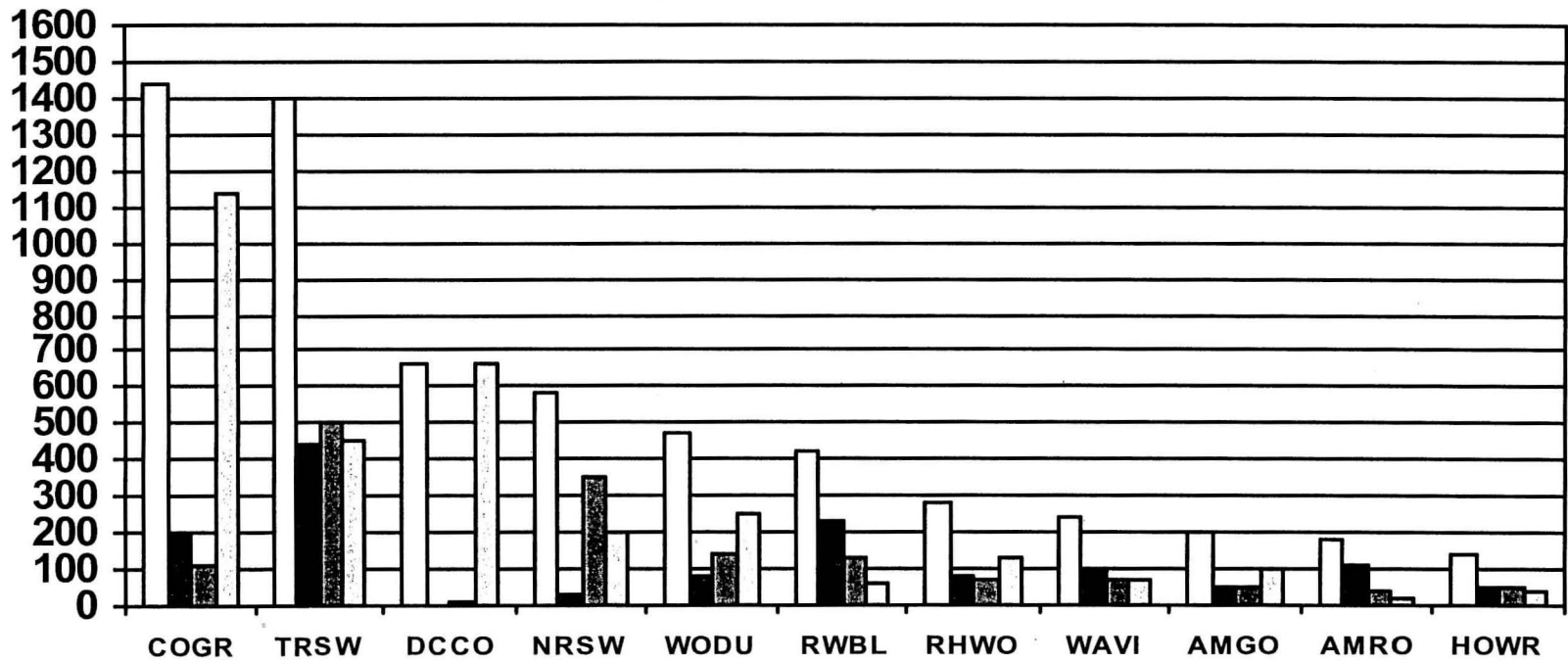
Large Numbers of Wood Duck Broods Observed

Neotropical Migrants Present (45 species)

- | | |
|----------------------------------------|--------------------------------|
| * <i>Yellow-billed Cuckoo</i> | * <i>Red-eyed Vireo</i> |
| * <i>Black-billed Cuckoo</i> | <i>Warbling Vireo</i> |
| * <i>Chimney Swift</i> | <i>White-eyed Vireo</i> |
| * <i>Ruby-throated Hummingbird</i> | <i>Philadelphia Vireo</i> |
| * <i>Eastern Kingbird</i> | * <i>Yellow-throated Vireo</i> |
| * <i>Great Crested Flycatcher</i> | |
| * <i>Olive-sided Flycatcher</i> | <i>Blue-winged Warbler</i> |
| * <i>Eastern Wood-pewee</i> | <i>Golden-winged Warbler</i> |
| <i>Least Flycatcher</i> | <i>Orange-crowned Warbler</i> |
| * <i>Baltimore Oriole</i> | <i>Tennessee Warbler</i> |
| * <i>Rose-breasted Grosbeak</i> | <i>Nashville Warbler</i> |
| <i>Scarlet Tanager</i> | * <i>Yellow Warbler</i> |
| <i>Purple Martin</i> | <i>Chestnut-sided Warbler</i> |
| <i>Cliff Swallow</i> | <i>Magnolia Warbler</i> |
| * <i>Bank Swallow</i> | <i>Yellow-throated Warbler</i> |
| <i>Barn Swallow</i> | <i>Bay-breasted Warbler</i> |
| * <i>Northern Rough-winged Swallow</i> | <i>Palm Warbler</i> |
| <i>Swallow</i> | <i>Blackpoll Warbler</i> |
| * <i>Gray Catbird</i> | <i>Black-and-White Warbler</i> |
| * <i>House Wren</i> | * <i>Prothonotary Warbler</i> |
| * <i>Blue-gray Gnatcatcher</i> | <i>Northern Waterthrush</i> |
| <i>Swainson's Thrush</i> | * <i>American Redstart</i> |
| * <i>Indigo Bunting</i> | <i>Wilson's Warbler</i> |
| | * <i>Common Yellowthroat</i> |

* *Detected during the nesting season – Likely to be nesting on the Refuge & have produced young.*

Relative Abundance Results
(Species with the Greatest Number of Birds Detected)
Keithsburg Division



Total
 Spring Migration
 Breeding Season
 Fall Migration

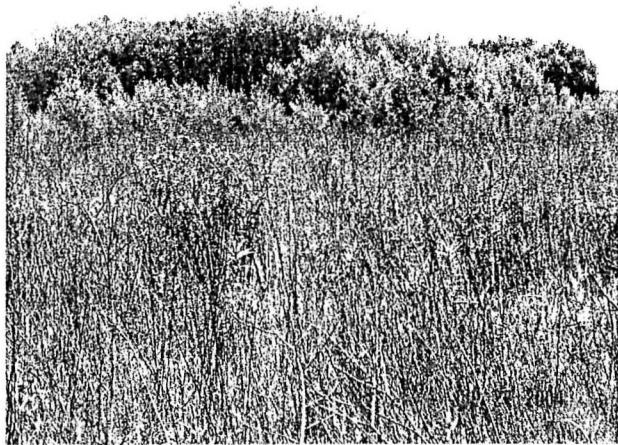
**Horseshoe Bend Division
Point Count Sites**



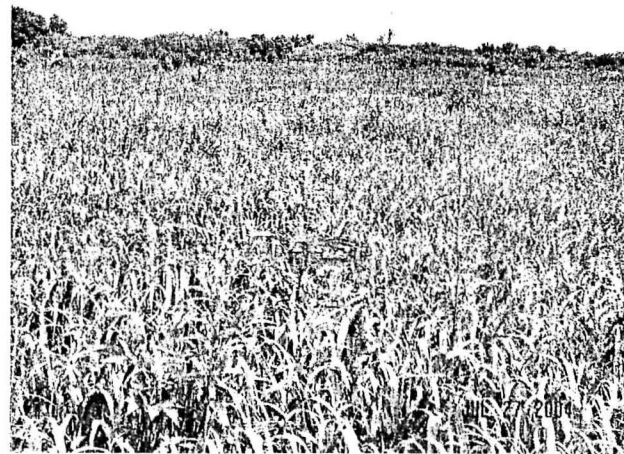
Wet Meadow Restoration –
Planted & Annual Spring Burn



Grassland Restoration - Planted & 3 Yrs
of Spring Burns w/ 1 Year Rest Interval



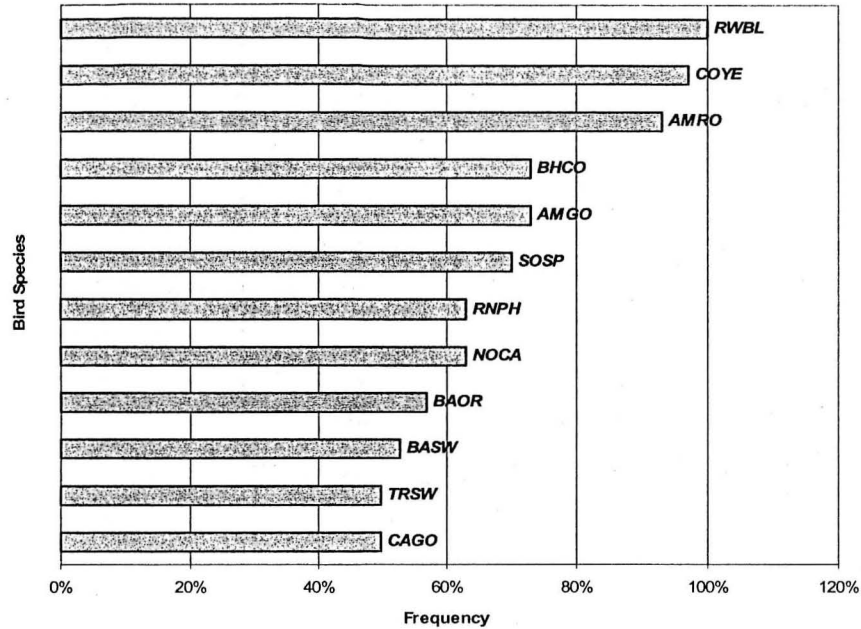
Natural Regeneration Wet Meadow –
Spring Burn w/ Rest Interval



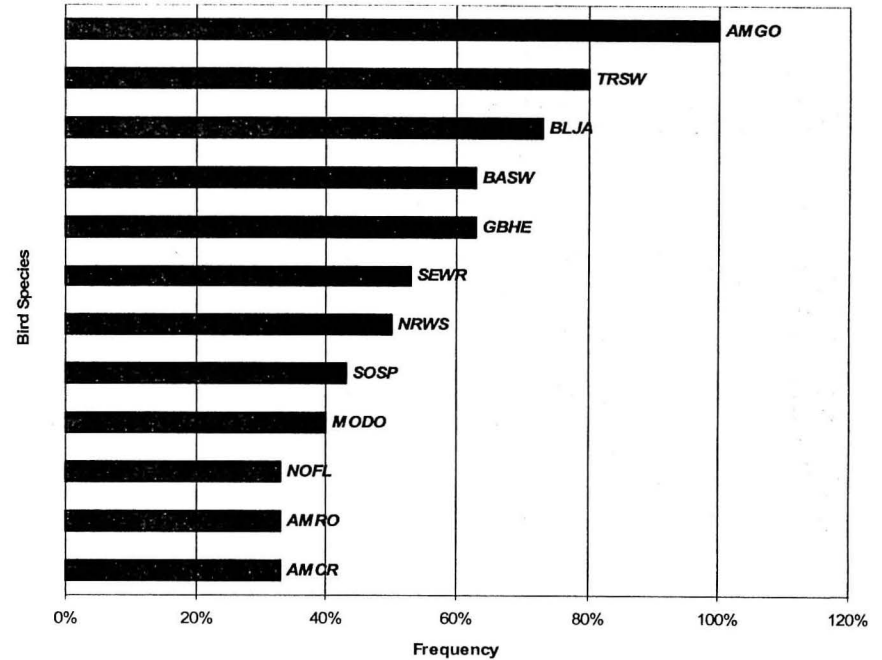
Natural Regeneration Grassland –
Spring Burn w/ 2 Years of Rest Interval

Horseshoe Bend Division Frequency of Occurrence Results

Most Often Detected Bird Species During the Spring Point Counts - Horseshoe Bend Division



Most Often Detected Bird Species During the Fall Point Counts - Horseshoe Bend Division



Spring Migration vs. Fall Migration Differences:

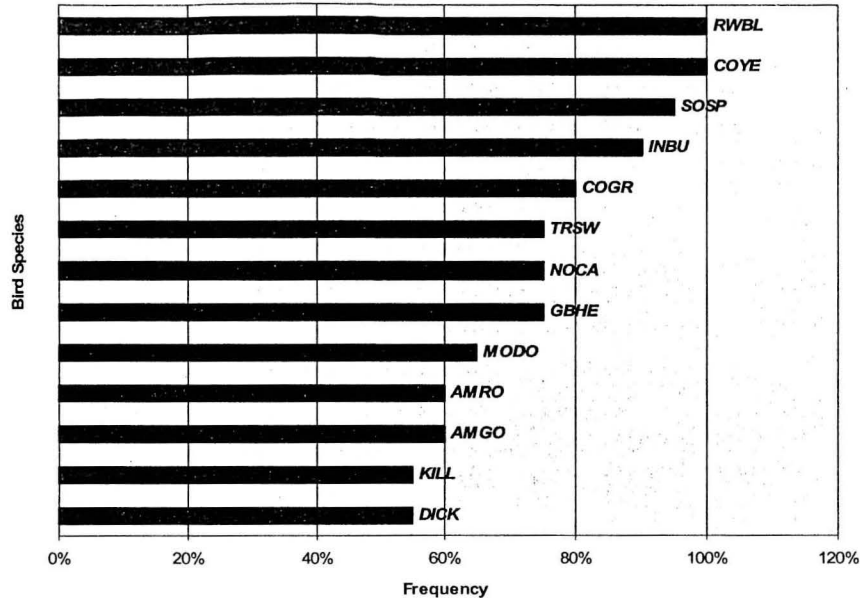
American Robins, Red-winged Blackbirds, and Common Yellowthroats with High Frequency in the Spring and Low Frequency in the Fall
A Higher Frequency of Northern Cardinals, Baltimore Orioles, Canada Geese, and Ring-necked Pheasants in the Spring than in the Fall
A Higher Frequency of Blue Jays, Sedge Wrens, Northern Rough-winged Swallows, and Great Blue Herons in the Fall than in the Spring

Species Only Detected in the Spring Migration: White-crowned, and Lark Sparrows, Blue Grosbeaks, Chimney Swifts, American Pipits, Tennessee, Yellow-rumped, Palm, and Blackpoll Warblers.

Species Only Detected in the Fall Migration: Mourning Warblers, Olive-sided and Least Flycatchers, Baird's Sandpipers, and Short-billed Dowitchers.

Horseshoe Bend Division Frequency of Occurrence Results

Most Often Detected Bird Species During the Breeding Season Point Counts
Horseshoe Bend Division



Nesting Grassland Species Present:

Bobolink	Grasshopper Sparrow
Dickcissel	Vesper Sparrow
Sedge Wren	Field Sparrow
Eastern Meadowlark	Chipping Sparrow
Le Conte's Sparrow	Nelson's Sharp-tailed Sparrow

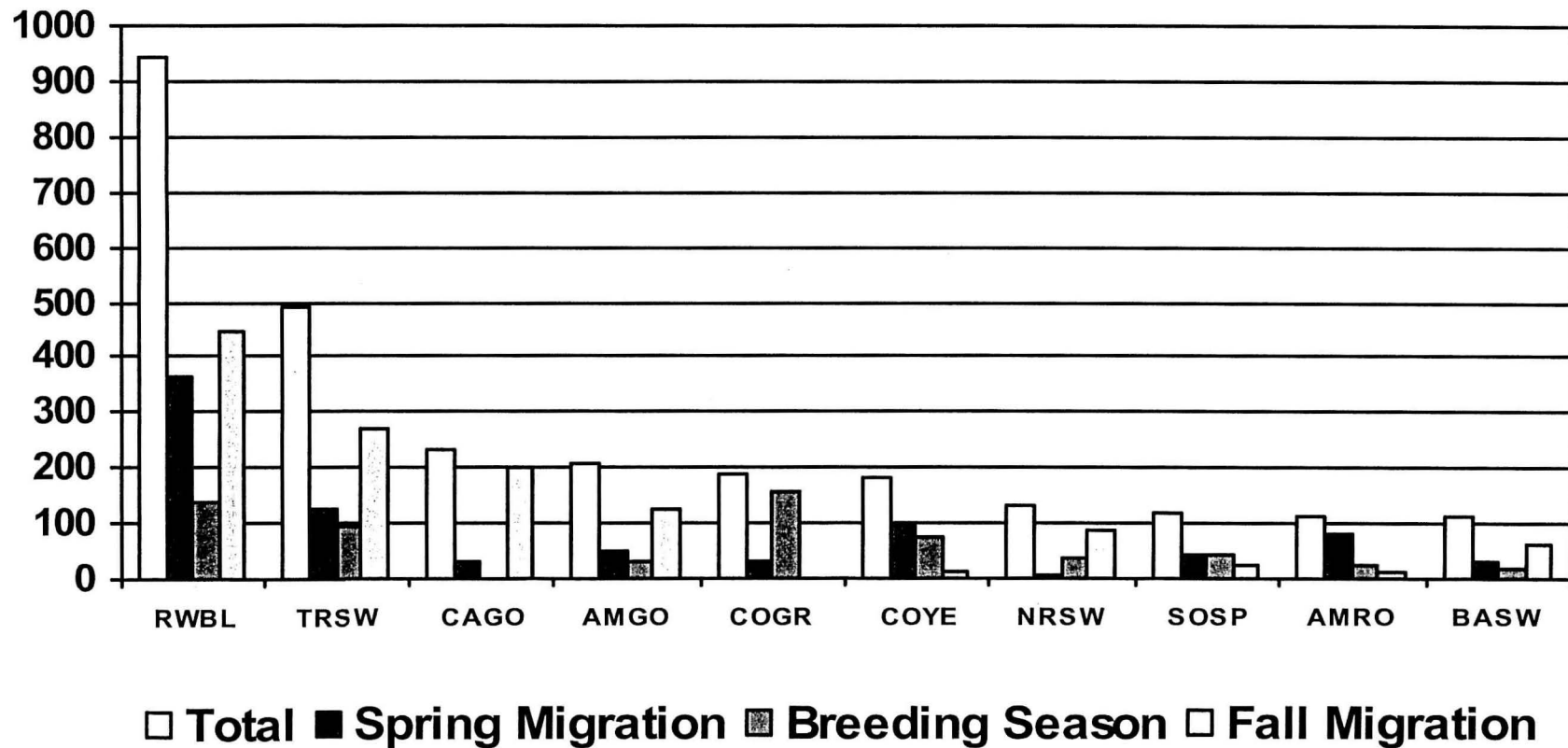
(Henslow's Sparrow detected in past years)

Species Only Detected during Breeding Season: Yellow-billed Cuckoo, Prothonotary Warbler, Willow Flycatcher, Eastern Phoebe, Eastern Wood-pewee, Marsh Wren, and Carolina Wren

Neotropical Migrants Present (37 species)

- | | |
|--------------------------------------------------------------------------------------------------|-------------------------|
| * Yellow-billed Cuckoo | * Red-eyed Vireo |
| * Chimney Swift | * White-eyed Vireo |
| Ruby-throated Hummingbird | * Bell's Vireo |
| * Eastern Kingbird | * Yellow-throated Vireo |
| * Great Crested Flycatcher | * Warbling Vireo |
| * Willow Flycatcher | |
| * Eastern Wood-pewee | |
| Least Flycatcher | Common Yellowthroat |
| * Baltimore Oriole | Palm Warbler |
| * Orchard Oriole | Tennessee Warbler |
| * Rose-breasted Grosbeak | Blackpoll Warbler |
| Blue Grosbeak | Mourning Warbler |
| * Grasshopper Sparrow | * Yellow Warbler |
| * Chipping Sparrow | |
| Lark Sparrow | |
| * Dickcissel | * Indigo Bunting |
| * Bobolink | * Gray Catbird |
| Purple Martin | * House Wren |
| * Cliff Swallow | * Blue-gray Gnatcatcher |
| * Bank Swallow | |
| * Barn Swallow | |
| * Northern Rough-winged Swallow | |
| * Detected during the nesting season – Likely to be nesting on the Refuge & have produced young. | |

Relative Abundance Results
(Species with the Greatest Number of Birds Detected)
Horseshoe Bend Division



USFWS Priority Species of Management Concern and/ or PIF Priority Species for the Dissected Till Plains (PA 32)

Red-headed Woodpecker - FWS & PIF

Dramatic Population Decline over the Last 30 Years (3.8 % Annually)

Contributing Factors: Food Base Problems

Lack of Sufficient Nesting Locations

***Increased Competition for Nest Cavities from
European Starlings***

Strong Association w/ Savanna Woodlands

***From Pt. Count Data, appear to be thriving on both Big Timber and
Keithsburg Divisions because of the large abundance of
dead and dying trees (84% and 95% frequency/
207 and 284 birds detected).***



Northern Flicker - FWS

Significant Population Decline over the Last 30 Years (3 % Annually)

***Primarily from Increased Competition for Nest Cavities from
European Starlings***

Habitat is relatively open, wooded areas.

***The flicker is more tolerant of human disturbance and of sharing
nest cavities with other species than the red-headed woodpecker.***

***Point count data indicates moderate numbers of northern flickers
are present and are nesting on both Big Timber and Keithsburg
Divisions (31% and 35% frequency/ 34 and 37 birds detected).***



**USFWS Priority Species of Management Concern and/ or
PIF Priority Species for the Dissected Till Plains (PA 32)**

Red-shouldered Hawk - FWS, Endangered in IA and IL

*Population decline documented in mid-1950s
Currently considered to have a small but relatively stable breeding
population in IA and IL which demonstrates high nest fidelity.
Mid-1950 decline mainly attributed to habitat loss with also a
possibility of chemical contamination.
Area sensitive species – require large blocks of mature floodplain
forest on a magnitude of 500 acres.*

No hawks detected during the 2004 Point Counts.



Black-billed Cuckoo - FWS

*Significant Rangewide Population Decline over the Last 30 Years
(3.6 % Annually). Although the Upper Midwest population was
considered increasing until 1979, regional declines from 1980 to
2000 reflect a similar 2.9% annual decrease.*

*Prone to cyclical population fluctuations related to outbreaks of
tent caterpillars.*

*Decline attributed to loss of woodland and hedgerow habitat.
Habitat is secondary succession woodland and its nest is built much
later than other species in well-concealed (dense foliage) areas.*

*From point count data, cuckoos were present on the Keithsburg
Division but none were detected on the Big Timber Division.*



USFWS Priority Species of Management Concern and/ or PIF Priority Species for the Dissected Till Plains (PA 32)

Cerulean Warbler - FWS & PIF

***Dramatic Population Decline over the Last 30 Years (3.4 % Annually)
Regional decline in the Upper Midwest is even greater (5.7 % / yr)
This is the greatest decline for any of the N Am warbler species.
Decline attributed primarily to loss of breeding and wintering
habitat, as well as to low tolerance of habitat disturbance
and trait of non-territorial behavior on breeding range.
Area Sensitive Species – Requires large tracts of mature woodland
Estimates of 7,400 acres of contiguous forest needed to
support maximum breeding densities and 1,700 acres
to achieve half that density (Robbins et al. 1989)***

***From point count data, one cerulean warbler was detected in the
spring on the Big Timber Division but none were detected on
the Keithsburg Division.***

Prothonotary Warbler - FWS & PIF

***Inconclusive data on population status but concerned since the
late 1970's that the species may be declining.
Any declining trend would relate to the loss of bottomland forest
breeding habitat and mangrove wintering habitat.
This is the only cavity nesting warbler (usually nesting 5-10 ft. from
the ground) and it requires swampy, riparian woodlands as habitat.***

***Point count data indicates low numbers of these warblers are present
and nesting on Big Timber Division and high numbers of these
warblers are present and nesting on Keithsburg Division
(12% and 57% frequency/ 15 and 101 birds detected).***



Photo by Steve Angley

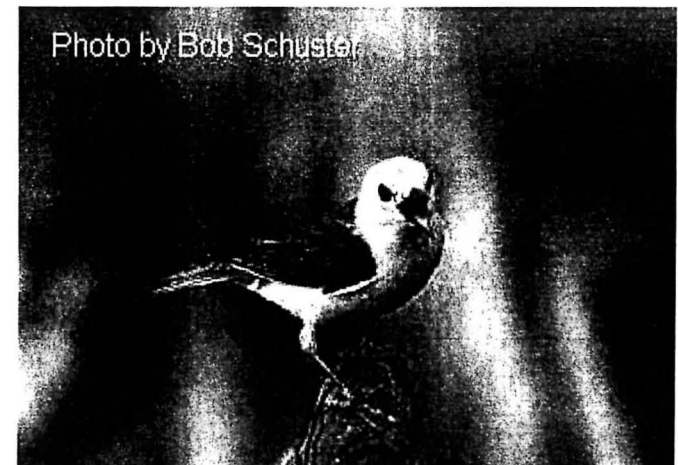


Photo by Bob Schuster

USFWS Priority Species of Management Concern and/ or PIF Priority Species for the Dissected Till Plains (PA 32)

Eastern Kingbird - PIF

**Significant Regional Population Decline in the Upper Midwest over the Last 30 Years (1.9 % Annually w/ IL at 2.2 % Annually)
Iowa population considered to be stable and represents important contributor to regional recovery**

Decline may be related to the long length of time required to rear independent young in this species (4- 5 weeks to teach young to hawk for food) and how this limits ability to re-nest or produce multiple broods.

Strongly Associated with Savanna Woodlands.

Documented success in defense against cowbird parasitism (ejects egg or abandons nest).

Point count data indicates low numbers of eastern kingbirds are present and nesting on the Keithsburg Division (11% frequency/ 15 birds detected) but none were detected on the Big Timber Division.

Wood Thrush - FWS

**Significant Population Decline over the Last 30 Years (2 % Annually)
Primarily from Habitat Loss and Heavy Cowbird Parasitism
Habitat is dense, interior forest with a multi-story structure.
This species is especially vulnerable when habitat is altered by thinning or fragmentation.**

Point count data indicates low numbers of eastern kingbirds are present and nesting on the Big Timber Division (17% frequency/ 27 birds detected) but none were detected on the Keithsburg Division.

