Birds of Southern Wisconsin Floodplain Forests

by Michael J. Mossman

Some of Wisconsin's wildest and most luxuriant forests lie within the floodplains of major streams and rivers. Because of their high water table and characteristic, periodic flooding, relatively few lowland forests have been converted to agriculture, and many have been incorporated into state and federal preserves. Thus, they now provide some of the largest continuous tracts of natural habitat in the midwest, and support migrant and breeding bird faunas that are distinctive and especially rich. The observer who explores these swampy woods must often deal with poor access, and aggravations such as mosquitos, poison ivy, nettles, and mud. Consequently, the bird life of these forests is less well known than that of many other, more accessible habitats in the state. This article describes the floodplain forests and their avifauna, and details some representative sites.

This discussion of floodplain forests is limited to those without conifers, and which occur mainly in the southern half of the state. The most extensive tracts border the Mississippi and lower Wisconsin Rivers, especially where their major tributaries enter (Figure 1). Substantial stands are also found along other rivers such as the Sugar, Rock, Baraboo, Yellow, Black, Chippewa, and Wolf, and as far north as the St. Croix and lower Peshtigo. Smaller tracts occur along many rivers and streams. A related type of habitat—lacustrine forest—forms swamps on poorly drained soils of lake margins or extinct lake beds, where surface water fluctuations are less extreme than in the river and stream bottoms; they are treated briefly in this paper.

Curtis (1959) combined these lacustrine and floodplain forests into the broad category of "southern lowland forests." Within this category, he used plant species composition rather than site characteristics to distinguish two forest types (Table 1). The more open-canopied "southern wet forest" is dominated by the most flood-tolerant tree species such as silver maple, willow, and cottonwood (Figure 2). The generally more close-canopied "southern wet-mesic forest," on drier or more stable sites, is dominated by American elm, silver maple, and green ash, with a complement of more mesic species

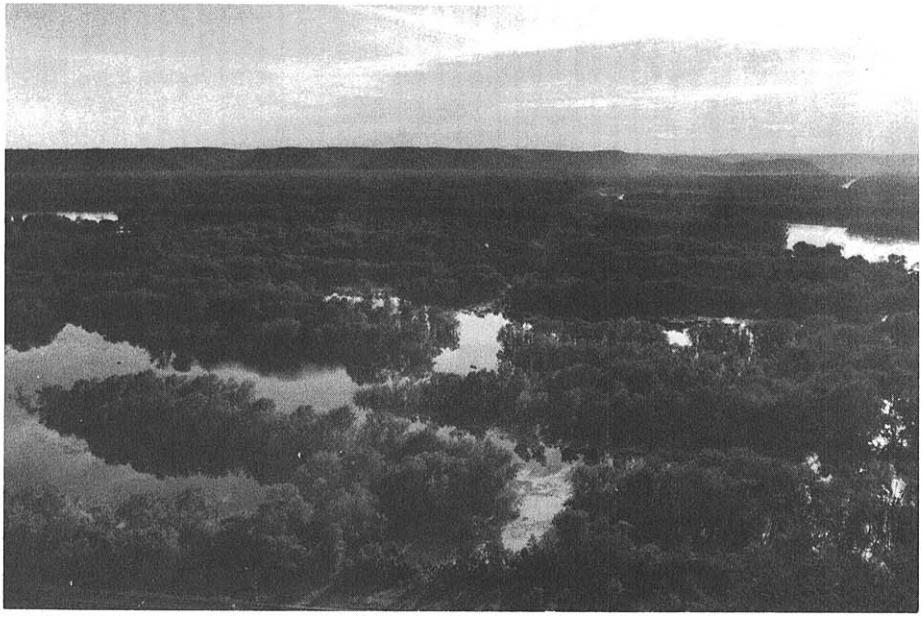

Figure 1. Mississippi River floodplain forest, Vernon County.

such as basswood and red maple (Figure 3). Southern lacustrine forests are included in both wet and wet-mesic categories, and are often dominated by black ash and red maple. The most common groundlayer species in wet forest are wood nettle (*Laportea canadensis*), poison ivy (*Rhus radicans*), and grape (*Vitis riparia*); in wet-mesic forest they are woodbine (*Parthenocissus vitacea*), wood nettle, and jewelweed (*Impatiens biflora*).

These forests tend to have affinities to lowland forests farther south, and several southern plant species find their way northward into Wisconsin only

Table 1. Ranking of the 7 most important tree species in southern Wisconsin lowland forests, based on average importance values of Curtis (1959).

	Rank in:	
Species	Wet Forest	Wet-mesic Forest
Silver maple (*Acer saccharinum*)	1	2
Willow (*Salix nigra*)	2	
Cottonwood (*Populus deltoides*)	3	
American elm (*Ulmus americana*)	4	1
River birch (*Betula nigra*)	5	
Swamp white oak (*Quercus bicolor*)	6	6
Green ash (*Fraxinus pennsylvanica*)	7	3
Basswood (*Tilia americana*)		4
Black ash (*F. nigra*)		5
Red maple (*A. rubrum*)		7

Figure 2. "Open" Wisconsin River slough, Crawford County.

Figure 3. "Closed" Wisconsin River slough amid silver maple, Grant County.

along these corridors of habitat. For example, sycamore (*Platanus occidentalis*) occurs only in the southernmost Wisconsin counties along the Sugar, Mississippi, and Wisconsin Rivers; and river birch is common along the Wisconsin and Mississippi Rivers and their tributaries, especially where the woods have been grazed, as far north as Buffalo and Wood Counties.

Because of frequent flooding, shrubs and tree seedlings have a difficult time becoming established, and so mature lowland forests often exhibit a fairly open understory, with large trees spaced well apart, their canopies spreading to form a cathedral-like ceiling. Poison ivy, grape, and woodbine commonly form heavy vines, or lianas, that reach into the canopy. Herbaceous ground cover may vary considerably between years, depending on the extent and longevity of flooding. Severe flooding may raise the water level four or more feet. It is usually limited to the spring season, but may extend well into the summer. During late June 1984, for example, one could easily canoe through extensive tracts of Mississippi River bottom woods, over ground that the previous June was dry and covered with nettles and poison ivy. Since wet-mesic forests occur on drier or more stable sites than do wet forests, their understory is typically better developed and more diverse. In general, southern wet forest succeeds to wet-mesic forest, and wet-mesic forest succeeds to mesic (sugar maple-basswood) forest only with a long-term drop in the water table or in the severity of flooding.

Southern floodplain forests are typically dissected by slough channels, former oxbows, and beaver flowages, where trees are killed or precluded by prolonged flooding. Floods also leave tangles of dead branches and detritus along sloughs. Sand or mud are often exposed on spits or slough margins, and commonly develop stands of dense willow saplings or shrubs, such as buttonbush (*Ceonothus occidentalis*). Canopy openings also occur as a result of disease, especially Dutch elm disease, which has virtually eliminated the American elm as a dominant canopy species since the time of Curtis' work. This has opened up the canopy of most wet-mesic forests, and somewhat obscured their distinction from wet forests.

Floodplain forests have suffered other losses and disturbances as a result of human activities, such as logging, grazing, ditching, conversion to agriculture, and inundation by dams. But, because of the difficulty of converting these forests, they have fared better than many of Wisconsin's native habitats. Comprising only 420,000 acres prior to settlement, southern lowland forests of moderate to high quality still cover some 32,000 acres, or 8% of their original extent. As other native habitats were decimated, corridors of lowland forests emerged as among the largest and probably the most viable remnants of natural plant and animal communities statewide, and especially so in the southern half of the state. They have become increasingly important as places for various forms of recreation, including hunting and fishing, as mitigation against flooding, as corridors of plant and animal migration and dispersal, and as breeding habitat for birds that require mature or extensive forests.

Much of Wisconsin's southern floodplain forest is owned and managed by public agencies and utilities.

The U.S. Fish and Wildlife Service manages many thousands of acres along both sides of the Mississippi River, as part of the Upper Mississippi National Wildlife and Fish Refuge. Water levels along this entire stretch of river are regulated by the U.S. Army Corps of Engineers at a series of 10 locks and dams. Many of the southern floodplain forests of the St. Croix River are managed by the National Park Service as a National Scenic Riverway. Privately owned, public utilities such as the Wisconsin Power and Light Company and Wisconsin River Power Corporation own substantial acreages along the Wisconsin River in association with their hydroelectric dams and reservoirs.

The Wisconsin Department of Natural Resources (WDNR) owns and manages several thousands of acres as state parks and wildlife areas along many floodplains, such as the Mississippi, Wisconsin, St. Croix, White, and Wolf Rivers. State Natural Areas have been designated within some of these state and federally owned tracts, and have been purchased by WDNR elsewhere, sometimes with the assistance of The Nature Conservancy. Today, these various agencies protect a total of 16 designated natural areas of this community type, comprising several thousand acres.

The importance of riverbottom corridors to migrant birds is well known among birdwatchers, many of whom travel regularly to sites such as Wyalusing, at the confluence of the Wisconsin and Mississippi Rivers, to view spring and fall migrations of songbirds and raptors. The bottoms are also popular birding spots in winter for Golden-crowned Kinglet and Brown Creeper, most woodpeckers, the occasional Yellow-rumped Warbler feeding on poison ivy berries, species such as Song Sparrows that frequent springs, and the Bald Eagle and various gulls and waterfowl that concentrate at open water.

It is during the nesting season that the birdlife of floodplain forests is most intriguing. At this time, resident birds tend to segregate into the particular breeding microhabitats to which they are especially adapted. My discussion of this avifauna is based mainly on data from the Natural Areas breeding-bird survey program (Mossman and Matthiae 1988), especially from surveys I conducted by foot and canoe in 85 floodplain stands durings 1978–86. These stands were between 40 acres and several hundreds of acres in size, located along 19 rivers in 22 counties. They include 11 of the state's 16 designated natural areas of this type, and many other public and private tracts of moderate to high quality. Surveys lasted from one to several hours. The number of individual birds recorded per survey ranged from 30 to approximately 400. Birds of adjacent habitats such as marshes, shrub swamps, and upland forests, were not counted in these surveys, even when these habitats interdigitated with the floodplain forests. I counted birds in open channels and shorelines only when channels were less than about 30 m wide.

Although I usually estimated percent cover of canopy and understory species during these surveys, it was often difficult to classify stands as either wet or wet-mesic. This was because of the problem with elm die-offs, the mosaic pattern of wet and wet-mesic microsites within many stands, and the composition of most stands being roughly intermediate between wet and wet-mesic (e.g., dominated by silver

maple, with small, approximately equal proportions of green ash, river birch, and swamp white oak). However, trends were apparent in the distribution of some bird species along the gradient from wet to wet-mesic. More obvious differences were found between the avifaunas of "open" stands that were dissected with many open sloughs and channels, and "closed" forest in which sloughs or channels were fewer and mostly covered by tree canopy.

Table 2 summarizes the frequency of occurrence, general abundance, and habitat associations of 91 species encountered on the 85 breeding-bird surveys. Missing from the table are a few species that breed uncommonly in flooplain forest, including Double-crested Cormorant, Osprey, Wild Turkey, Cooper's Hawk, and Screech Owl. The most frequently encountered species, in descending order, were: Great Crested Flycatcher, Eastern Wood-Pewee, Song Sparrow, Northern House Wren, American Robin, American Redstart, Northern Oriole, Downy Woodpecker, Blue-gray Gnatcatcher, and Blue Jay. Other less common species may also be considered characteristic of southern floodplain forests, since they are more abundant here than in most or all other habitat types in Wisconsin. These include the Yellow-crowned Night-Heron, Wood Duck, Red-shouldered Hawk, Barred Owl, Yellow-bellied Sapsucker, Tufted Titmouse, Brown Creeper, Warbling Vireo, and the Prothonotary, Kentucky, and Yellow-throated Warblers.

I also surveyed 5 southern lacustrine swamps, and found a bird fauna similar to that of floodplain forests. Great Crested Flycatcher and Common Yelowthroat were most common. There were relatively more Hairy Woodpeckers, Veeries, American Robins, and Scarlet Tanagers, and fewer Red-bellied Woodpeckers, Warbling Vireos, and Prothonotary Warblers than in floodplain forests. Northern species such as Winter Wren, Golden-winged Warbler, Canada Warbler, and Northern Waterthrush occurred in some stands near the tension zone.

There are several distinctive features in the floodplain forest avifauna. One is the large number of fish-eating species, including Double-crested Cormorant, 4 species of herons, Great Egret, Belted Kingfisher, Bald Eagle, Osprey, Hooded Merganser, and even Common Grackle. Several of these fish-eaters nest colonially. Great Blue Herons nest in many floodplain and lacustrine forests, as well as upland sites, singly or in colonies ranging in size from 2 to over a thousand nests. The largest and most stable colonies occur in mature stands that are isolated from human disturbance. Great Egrets have nested in recent years among several of the largest Great Blue Heron colonies on the Mississippi River, as well as in floodplain forests of the Wolf and Embarass Rivers, and Fourmile Island State Natural Area in Horicon Marsh. Yellow-crowned Night-Herons apparently nest singly or in very small colonies in floodplain forests along the lower Baraboo, Wolf, Yellow, lower Wisconsin, and Mississsippi Rivers. Black-crowned Night-Herons nest mostly in cattail and bulrush marshes, shrub swamps, and isolated shrub- or tree-covered islands, but occasionally in floodplain forest. Although Double-crested Cormorants usually nest on isolated snags and islands, they sometimes nest within floodplain forests, such as the Ambrough Slough Great

Table 2. Abundance and habitat associations of birds breeding in southern Wisconsin floodplain forests.

Species	Frequency (%)[1]	Abundance[2]	Habitat Association
Great Blue Heron	58	C	Open or wooded sloughs
Great Egret[3]	5	U	Open sloughs
Green-backed Heron	25	U	
Black-crowned Night-Heron	1	R	
Yellow-crowned Night-Heron[3]	4	U	Extensive forest
Wood Duck	55	C	Open or wooded sloughs
Mallard	15	U	Open or wooded sloughs
Blue-winged Teal	4	U	Open sloughs
Hooded Merganser	7	U	Wooded sloughs
Turkey Vulture	7	U	
Bald Eagle[3]	1	R	
Red-shouldered Hawk[3]	32	FC	Moderate to large tracts
Broad-winged Hawk	1	R	North only
Red-tailed Hawk	4	U	
Ruffed Grouse	1	R	Drier sites, near uplands
Sandhill Crane	1	R	
Spotted Sandpiper	5	U	Stream, river and slough margins
Black Tern	1	R	
Mourning Dove	21	U	
Black-billed Cuckoo	4	U	More common northward
Yellow-billed Cuckoo	65	C	Canopy of closed or (most often) open woods, declines northward
Great Horned Owl	12	U	Open woods
Barred Owl	33	FC	Open or closed woods
Common Nighthawk	5	U	
Whip-poor-will	2	R	On drier sites near uplands
Chimney Swift	27	FC	Sometimes near large chimney snags
Ruby-throated Hummingbird	15	U	
Belted Kingfisher	38	FC	Along rivers and streams
Red-headed Woodpecker	53	C	Mostly in open woods
Red-bellied Woodpecker	62	C	Mostly in closed woods
Yellow-bellied Sapsucker	64	C	Mostly in open woods, with birch
Downy Woodpecker	80	A	
Hairy Woodpecker	67	C	Increases northward
Northern Flicker	47	FC	
Pileated Woodpecker	45	FC	Mostly in extensive, mature forest
Eastern Wood-Pewee	93	A	Most common where canopy closed
Acadian Flycatcher[3]	5	U	Closed, wet-mesic, streamside woods
Willow Flycatcher	2	R	Open, shrubby sites
Least Flycatcher	16	U	Open woods and groves
Eastern Phoebe	8	U	Near buildings, bridges, cliffs
Great Crested Flycatcher	93	A	Most common near snags
Eastern Kingbird	15	U	Open woods and edges
Purple Martin	5	U	
Tree Swallow	68	C	Mostly channels among open woods

(continued)

Table 2. Abundance and habitat associations of birds breeding in southern Wisconsin floodplain forests (*continued*).

Species	Frequency (%)[1]	Abundance[2]	Habitat Association
Northern Rough-winged Swallow	19	U	Near cliffs, exposed banks, tip-ups
Bank Swallow	1	R	Near cliffs, exposed banks
Cliff Swallow	1	R	Near cliffs, bridges
Barn Swallow	7	U	Near bridges, farms
Blue Jay	78	A	Mostly closed woods
American Crow	55	C	
Black-capped Chickadee	62	C	
Tufted Titmouse	14	U	Decreases northward
White-breasted Nuthatch	76	A	
Brown Creeper	48	FC	Dead standing trees
House Wren	88	A	Piles of detritus and dead wood
Blue-gray Gnatcatcher	79	A	Canopy of open or closed woods
Eastern Bluebird	1	R	Open woods or sloughs with snags
Veery	16	U	Closed forest
Wood Thrush	20	U	Closed forest
American Robin	87	A	
Gray Catbird	59	C	Shrubby sites
Cedar Waxwing	35	FC	
European Starling	28	FC	Mostly near snags and openings
Yellow-throated Vireo	72	C	Mostly in open mature woods
Warbling Vireo	67	C	Open woods and edges
Red-eyed Vireo	74	C	Mostly in wet-mesic forest
Blue-winged Warbler	6	U	Wet-mesic forest openings
Yellow Warbler	28	FC	Mostly in open and wet forest
Yellow-throated Warbler[3]	2	R	Only where sycamore present
Cerulean Warbler[3]	36	FC	Canopy of extensive, mature forest
Black-and-white Warbler	1	R	Northward only
American Redstart	82	A	Diverse vertical forest structure
Prothonotary Warbler	72	C	Flooded trees, edges of sloughs
Ovenbird	26	FC	Wet-mesic forest
Northern Waterthrush	1	R	Swampy streamside
Louisiana Waterthrush	4	U	Closed streamside forest
Kentucky Warbler[3]	7	U	Lush understory in closed, extensive, mature forest
Mourning Warbler	9	U	Closed, mostly northern and central forest with dense shrubs or nettles
Common Yellowthroat	69	C	Mostly openings
Scarlet Tanager	22	U	Closed forest
Northern Cardinal	65	C	Declines northward
Rose-breasted Grosbeak	58	C	Wet-mesic forest
Indigo Bunting	59	C	Wet-mesic forest openings and edges

(*continued*)

Table 2. Abundance and habitat associations of birds breeding in southern Wisconsin floodplain forests (*continued*).

Species	Frequency (%)[1]	Abundance[2]	Habitat Association
Rufous-sided Towhee	7	U	
Song Sparrow	93	A	Slight preference for wet forest
Red-winged Blackbird	62	C	Mostly open forest and edges
Common Grackle	75	A	Edges of water, flooded woods
Brown-headed Cowbird	55	C	
Northern Oriole	81	A	Mostly open forest
American Goldfinch	64	C	Mostly wet forest and shrubby edges
House Sparrow	2	R	Sometimes in heron rookeries

[1]Percent of stands in which the species was recorded.
[2]A = Abundant, C = Common, FC = Fairly Common, U = Uncommon, R = Rare.
[3]Designated or proposed as threatened or endangered in Wisconsin.

Blue Heron colony near Prairie du Chien.

Cavity nesters, wood drillers, and bark gleaners are probably better represented in lowland forests than in any other community in Wisconsin, a reflection of the large number of trees typically injured or killed by fluctuating water levels and Dutch elm disease. Seven of Wisconsin's 8 breeding woodpecker species are fairly common to abundant here. Altogether, 25 (27%) of the 91 species in Table 2, including over a third of those species considered common or abundant, nest at least sometimes in tree cavities. One of these, the House Sparrow, also sometimes nests within the large stick nests of herons and egrets. Another characteristic floodplain species, the Brown Creeper, nests primarily under the bark of dead or dying trees, while the Great Egret, herons, Eastern Kingbird, Osprey, and Bald Eagle often nest on snags. Some of these species have undoubtedly increased over the past 25 years in response to the widespread effects of Dutch elm disease, and may decline again as the remaining elms collapse. This is probably most likely for the Red-headed Woodpecker, which nests frequently in dead elms from which the bark has fallen.

Cliff nesters are also prevalent in the floodplain fauna, because of the frequent proximity to rock cliffs, cutbanks, and bridges. Of these species, the Bank Swallow and Kingfisher are most restricted to natural sites, whereas Barn Swallows and Rock Doves nest almost entirely on bridges and buildings. Floodplain Cliff Swallows and Eastern Phoebes nest about as readily on natural as artificial substrates, as do Europeon Starlings, which also use tree cavities. The nests of Common Grackles and Robins are occasionally built under bridges. Rough-winged Swallows nest in cliffs and cutbanks, sometimes in small cavities of bridges, and rarely, in the absence of such sites, over water among the upturned roots of fallen trees.

A few floodplain forest birds may be considered "northern" species. The Song Sparrow and Hairy Woodpecker,

for instance, are widespread but increase in abundance northward within this forest type. The Mourning Warbler, Veery, and Northern Waterthrush are uncommon to rare in the southern counties, and increase northward. South of the tension zone, they are most common in lacustrine ash swamps, which resemble the hardwood and coniferous-hardwood swamps of northern Wisconsin in which these birds are often abundant.

The Yellow-bellied Sapsucker, Brown Creeper, and American Redstart are fairly widespread in northern Wisconsin, but in southern Wisconsin breed regularly only in lowland forests (Figures 4 and 5). They all nest commonly as far south as the Illinois border. The

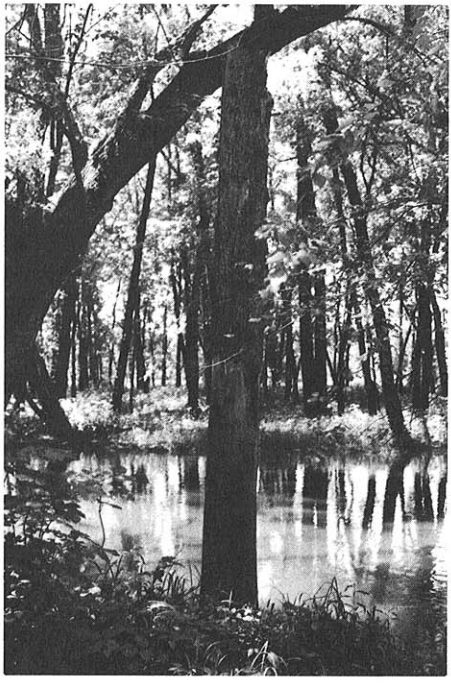

Figure 4. Wisconsin River slough, with Yellow-bellied Sapsucker nest on barkless section of snag, Richland County.

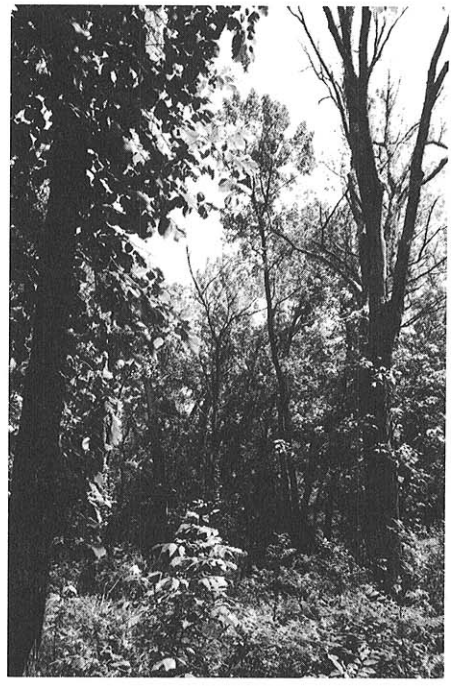

Figure 5. Floodplain forest opening around dead elm, which contains a Brown Creeper nest, Richland County.

Redstart tends to increase northward, while the Brown Creeper seems influenced more by the availability of dead standing trees than by latitude. The Sapsucker has an unusual distribution. It nests commonly along the Mississippi River from Dubuque to Lake Pepin, and along the lower Wisconsin from Wyalusing to Avoca. Northward along these rivers and their tributaries the species becomes uncommon, and north of the tension zone it becomes primarily an upland species. Especially in Grant, Crawford, and Buffalo Counties, Sapsucker nests are common, and easy to locate when the nestlings are vocal in June. Its floodplain distribution appears correlated with that of a southern plant species, river birch,

which is a common feeding and nesting substrate.

Like river birch, several other southern floodplain plant species decline or disappear northward in Wisconsin. Several southern bird species do so as well, some of which have expanded their breeding ranges northward primarily along river corridors in historic times. These include the Red-bellied Woodpecker, Tufted Titmouse, Blue-gray Gnatcatcher, and Northern Cardinal. The most extreme example of a southern bird species in Wisconsin is the Yellow-throated Warbler, formerly also called Sycamore Warbler, which occurs regularly during the breeding season only along the Sugar River in southern Rock County, where sycamore and other associated plant species extend northward into the state.

Today the Northern Cardinal is very common along the floodplains of southern Wisconsin, but becomes less frequent above LaCrosse and Portage, and is absent from the northernmost stands along the St. Croix and Peshtigo. Blue-gray Gnatcatchers and Cerulean Warblers decrease in abundance somewhat to the north, but occur regularly in suitable habitat even in the most northern sites. Kentucky Warblers breed at scattered sites along the Mississippi and Wisconsin as far upstream as Buffalo and Dane Counties. The Prothonotary Warbler nests commonly in appropriate habitat as far north as Buffalo, Columbia, and Waupaca Counties, and somewhat less commonly northward to Polk, Marathon, and Outagamie Counties.

The Parula Warbler, a characteristic breeder in floodplain forests south of Wisconsin as well as in lowland coniferous forests north of the tension zone, is conspicuously absent from southern Wisconsin floodplain forests. This may be largely due to the absence here of beard-like lichens or Spanish moss, in which the species usually nests.

An important feature of the floodplain forest avifauna is its large complement of species that depend on extensive, forested tracts in which to breed (Temple 1988). At least 20 species from Table 2 appear to require stands at least 40 acres in size, and some occur only in much larger tracts. For example, I found Kentucky Warblers on only 6 surveys in 4 distinct floodplain forest stands, which ranged in size from 500 to over 7,000 acres in size. Of the 8 present or proposed endangered and threatened species in Table 2, five are sensitive to forest fragmentation: Yellow-crowned Night-Heron, Red-shouldered Hawk, Acadian Flycatcher, and Cerulean and Kentucky Warblers.

Populations of most floodplain forest birds have undoubtedly declined with the degradation and loss of substantial acreages since settlement. Yet the large extent, maturity, and interconnection of many remaining floodplain forests means that the breeding bird life of this habitat has remained relatively intact. No species are known to have disappeared permanently from this forest type as a result of habitat destruction. Two floodplain species were lost as a result of hunting and habitat destruction elsewhere: the Passenger Pigeon, which once passed through these corridors by the millions, and the Carolina Parakeet, which may have nested sparingly along the Mississippi and other floodplains in extreme southern Wisconsin. Others such as the Double-crested Cormorant, Great Egret, Bald Eagle, and Osprey, were virtually extirpated from this hab-

itat but returned with protection, the banning of DDT and habitat management. Careful management may also bring back 2 additional species that once bred along the riverbottoms — the Peregrine Falcon and Trumpeter Swan.

The best way of ensuring that these floodplain forest bird communities remain intact is by careful stewardship of their habitat. This means managing and protecting forests to meet the habitat requirements of individual species, with special attention paid to those species that are threatened or that are uncommon in other Wisconsin habitats; and by maintaining large, interconnected tracts that minimize the chances of local extinctions (Temple 1988).

These various characteristics of the rich, floodplain forest avifauna, and the particular habitat distributions of individual species make for fascinating birding during the breeding season. Observers willing to explore the larger, seemingly forbidding tracts by foot or canoe are further rewarded by an atmosphere of wildness and luxuriance, and by the discoveries that can be made in areas little known to other birdwatchers.

For example, in extensive, mature forests with trees at least 70 feet tall, you will almost certainly hear Cerulean Warblers in the canopy, and may find Kentucky Warblers among a lush understory of forbs, shrubs, and vines. In openings caused by the death of elms and other canopy trees, look for American Redstart, Indigo Bunting, Gray Catbird, Rose-breasted Grosbeak, and Mourning Warbler. Where dead, standing trees are prevalent, you will often hear the high tumbling songs of Brown Creepers, and might follow adults to their nests beneath slabs of bark on dead trees. Prothonotary Warblers, the "Golden Swamp Warblers" of early naturalists, are easily located in many flooded woods or on the edges of sloughs, where they can be watched feeding their fledglings, or at nest cavities in snags usually 3–5 feet above the ground or water. The nests of Yellow-bellied Sapsuckers are perhaps the most easily found of all floodplain forest birds, when their nestlings beg loudly from cavities of river birch and other live or dead trees.

Coming upon sloughs or channels, you may come upon a Great Blue Heron, Great Egret, or—if you're fortunate and in extensive forest—a Yellow-crowned Night-Heron. The more open sloughs and their patches of dense shrubs and saplings tend to be dominated by Tree Swallow, Red-winged Blackbird, Common Grackle, Eastern Kingbird, American Goldfinch, Song Sparrow, and Common Yellowthroat. Sometimes associated with these sloughs are marshes with additional breeders such as Black Tern, Marsh Wren, and Yellow-headed Blackbird. Almost everywhere in wooded tracts are Great Crested Flycatcher, Eastern Wood-Pewee, House Wren, Blue-gray Gnatcatcher, and Song Sparrow. Fairly extensive woods along smaller streams tend to have fewer Prothonotary Warblers, House Wrens, and Common Grackles than along major rivers, and more mesic-loving species such as Acadian Flycatcher, Wood Thrush, Red-eyed Vireo, and Louisiana Waterthrush.

Other fauna commonly observed in floodplain forests are muskrat, beaver, otter, gray and fox squirrels, raccoon, and several species of bats, turtles, frogs, and salamanders.

The southern floodplain forest is one of the few types of habitat in which intact breeding-bird communities are still possible without major restoration efforts. WSO members can help agencies such as the Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, and The Nature Conservancy maintain these communities by: lending financial support; contributing useful ornithological data through the WDNR's Natural Areas breeding-bird survey; and providing input on preservation priorities and other activities such as logging, public access, and the creation and management of impoundments. In so doing, we help guarantee future generations the same opportunities to wander the riverbottoms among the songs of species such as Cerulean, Kentucky, and Prothonotary Warblers.

Description of Sites

The following 3 floodplain forests are among the finest examples remaining in Wisconsin, and together include a broad spectrum of local habitat conditions and breeding bird species. As is typical for the most pristine sites, access is difficult and limited to a few road and railroad grades, except by canoe. Visitors should be prepared for mosquitoes, nettles, poison ivy, and wet ground.

Nelson-Trevino Bottoms

Site.—At 3,740 acres, the largest of WDNR's 217 designated natural areas. With the adjacent Tiffany Wildlife Area it comprises the largest floodplain forest (8,000 acres) along the upper Mississippi River.

Location.—Western edge of Buffalo County, at the confluence of the Chippewa and Mississippi Rivers. It is bounded on the south by the Mississippi, on the west by the Chippewa, on the north by the Burlington Northern railroad grade, and on the east by State Highway 25.

Access.—To view the eastern edge of the tract, stop along Highway 25 just south of the Village of Nelson. Floodplain forest just north of the natural area is viewed by stopping along Highway 35, 2–4 miles north and west of Nelson. Or, from Highway 35, 3.5 miles west of Nelson, walk the inactive railroad grade southward 0.5 miles to the north edge of the natural area. The best way to penetrate the interior of the area is by boat, preferably canoe, from the various access points along either highway, especially when water levels are moderate to high. A compass, and an aerial photograph, topographic map, or Upper Mississippi National Wildlife and Fish Refuge map are highly recommended. Maps are not absolutely reliable because the amount of navigable water varies widely between seasons and years.

Site Description.—This tract was partially cut and perhaps burned, and its more accessible meadows grazed and mowed prior to protection by federal refuge status in 1924. However, it remains one of the most pristine floodplain forests in the midwest — a mosaic of mature and young forest, sloughs, channels, marshes, meadows, and shrubby thickets. Forest covers about half of the area, and is dominated by silver maple, with river birch, cottonwood, elm, and green ash. The interior

has a wilderness aspect, and is worth at least a half-day's visit by canoe.

Birds.—Table 3 lists the numbers of birds recorded while canoeing for a total of 10 hours on 3 June days, with no overlapping coverage. There are especially high numbers of birds such as Tree Swallow, Yellow-bellied Sapsucker, Warbling Vireo, Red-winged Blackbird, and Common Grackle, which prefer open forests and sloughs. Table 3 does not include herons and egrets encountered within the large rookery located near the center of the tract. This rookery has included over 200 active nests of Great Blue Herons and Great Egrets annually for at least 20 years. Great Egrets declined from 122 nests in 1977 (Thompson 1978) to 43 in 1984, and 0 in 1988, as the population has apparently shifted to other Mississippi River colonies. During the canoe surveys, I located 5 active nests of Prothonotary Warbler and 4 of Northern Oriole, among others.

Wauzeka Bottoms

Size.—The soon-to-be-designated natural area encompasses 798 acres, and is part of a complex of extensive forested tracts along this section of river.

Location.—Southern Crawford County at the confluence of the Wisconsin and Kickapoo Rivers. Bounded on the north by the Milwaukee, St. Paul and Pacific Railroad, on the west by the Kickapoo River, and on the south and east by the Wisconsin River.

Access.—Access is by canoe along the Wisconsin and Kickapoo Rivers, from landings in the Village of Wauzeka, or along Highway 132 on the south side of the Wisconsin, directly across from the natural area, 2 miles west of Woodman. Visitors can watch and listen from the rivers, or can stop along the riverbanks and walk into the tract. At times of high water, you can penetrate the western part of the tract along a winding shortcut channel that connects the 2 rivers. Although some observers walk the railroad tracks from the Village of Wauzeka, eastward along the north side of the tract, this is not recommended, since the railroad is active and privately owned.

Site Description.—Although some cutting has occurred in the past, this remains the best and largest tract of mature floodplain forest along the Lower Wisconsin, and perhaps the finest southern wet-mesic forest statewide. Recently purchased by The Nature Conservancy, its ownership is being transferred to WDNR. Near the Wisconsin River, the canopy is high and relatively complete, composed of silver maple, swamp white oak, and green and black ashes. The understory is lush, with a fairly complete ground cover and many lianas. Low pockets and sloughs are scattered through the interior, especially along the railroad grade, and are dominated by snags, an open canopy of silver maple and river birch, shrubs such as buttonbush, and emergents that include *Sagittaria* and *Iris*.

Birds.—Table 3 lists those birds encountered on the afternoon of 16 June 1984, amid intermittent rain, while walking the railroad tracks, then canoeing the Wisconsin River along the tract's southern edge, and through the shortcut slough to the Kickapoo. This area has a diverse admixture of open-

Table 3. Numbers of birds encountered on breeding season surveys in 3 southern floodplain forest tracts.

Species	Number of birds encountered at: Nelson-Trevino	Wauzeka	Avon
Great Blue Heron	6[1]	5	1
Great Egret	3[1]	0	0
Green-backed Heron	1	2	1
Yellow-crowned Night-Heron	0	+	0
Wood Duck	7[1]	7[1]	3
Mallard	1	1	0
Blue-winged Teal	2[1]	0	0
Hooded Merganser	0	+[1]	0
Red-shouldered Hawk	3	1	0
Spotted Sandpiper	0	0	1
Mourning Dove	3	0	1
Yellow-billed Cuckoo	7	13	2
Barred Owl	+	3	2
Chimney Swift	7	7	0
Ruby-throated Hummingbird	0	1	1
Belted Kingfisher	1[1]	2	0
Red-headed Woodpecker	2	4[1]	3
Red-bellied Woodpecker	7	8	12
Yellow-bellied Sapsucker	32	14[1]	0
Downy Woodpecker	12	11[1]	10
Hairy Woodpecker	12[1]	7[1]	1
Northern Flicker	3	4	2
Pileated Woodpecker	2	4	1
Eastern Wood-Pewee	11	15[1]	42
Acadian Flycatcher	0	0	3
Least Flycatcher	0	0	3
Eastern Phoebe	0	+[1]	0
Great Crested Flycatcher	17	20	48
Eastern Kingbird	1	+	0
Purple Martin	0	2	0
Tree Swallow	92[1]	21[1]	12
Northern Rough-winged Swallow	4	+	6[1]
Cliff Swallow	0	0	2
Barn Swallow	3	0	10[1]
Blue Jay	4	4	6
American Crow	4	5	8
Black-capped Chickadee	4	4[1]	2
Tufted Titmouse	+	+	7
White-breasted Nuthatch	13	9	6
Brown Creeper	7	3	1
House Wren	63	28	72
Blue-gray Gnatcatcher	33	20	14
Eastern Bluebird	0	+[1]	0
Veery	0	1	3
Wood Thrush	0	2	4
American Robin	16	8	7
Gray Catbird	3	12	17
Cedar Waxwing	1	1	9
Europeon Starling	2	+	3
Yellow-throated Vireo	6	6	7
Warbling Vireo	48[1]	2	0
Red-eyed Vireo	3	4	17
Yellow Warbler	0	1	2

(*continued*)

Table 3. Numbers of birds encountered on breeding season surveys in 3 southern floodplain forest tracts (*continued*).

Species	Number of birds encountered at: Nelson-Trevino	Wauzeka	Avon
Yellow-throated Warbler	0	0	2
Cerulean Warbler	5	5	7
American Redstart	20	33	39
Prothonotary Warbler	23[1]	27[1]	9
Ovenbird	2	+[2]	0
Louisiana Waterthrush	0	0	1
Kentucky Warbler	0	3	0
Common Yellowthroat	14	17	8
Scarlet Tanager	0	1	2
Northern Cardinal	1	24[1]	26
Rose-breasted Grosbeak	5	2	13
Indigo Bunting	6	7	19
Song Sparrow	16	48	24
Red-winged Blackbird	64[1]	16	2
Common Grackle	113[1]	25[1]	6
Brown-headed Cowbird	11[1]	1	16
Northern Oriole	32[1]	9[1]	4
American Goldfinch	5	16	2
House Sparrow	0	+	0

[1]Positive evidence of nesting (active nest or local brood).
[2]+ Recorded on other visit(s).

and closed-forest species, with especially good representation of those that prefer extensive, mature tracts, e.g., Yellow-crowned Night-Heron, Pileated Woodpecker, and Cerulean and Kentucky Warblers. Kentucky Warblers can usually be heard from the Wisconsin River.

Avon Bottoms

Size.—The entire forested tract covers about 800 acres along a 5-mile corridor, 0.1–0.5 miles in width. Only a portion of this is designated as a state natural area, the boundaries of which are currently being revised.

Location.— Along the Sugar River between the Village of Avon and the Illinois state line, in southwestern Rock County.

Access.—This stretch of river is spanned only by Nelson Road, which heads south from Highway 81 about 13 miles west of Beloit. It bisects the forest through a particularly good section. View here from the bridge or shoulder. The best birding is by canoe within about 1.5 miles either direction of Nelson Road. If you're willing to paddle upstream, put in and take out at this bridge. Otherwise, put in along Beloit-Newark Road, 0.5 mile west of the Village of Avon, and allow about 3–4 leisurely hours to reach Nelson Road. If you canoe beyond Nelson Road, allow 5–6 hours to reach the next landing, which is about 8 river miles downstream at Illinois' Sugar River Forest Preserve.

Site Description.—This corridor includes the only major stand of syca-

more in Wisconsin, as well as populations of other southern plant species that are here at the northern extreme of their range. Among the dominant silver maples are many swamp white oaks, ashes, and cottonwoods, and scattered basswoods and sycamores, the latter of which include some of the tallest trees present. Meadow pastures, cropland, and bits of upland woods border the floodplain forest and sometimes the river channel.

Birds.—Data in Table 3 are from a canoe survey during 0550–1000 h on 31 May 1986, beginning at Nelson Road, going upstream 0.5 mile and then downstream to the Illinois border. The main attaction here is the population of Yellow-throated Warblers, which occur sparingly, often in or near sycamores, between Avon and about 1.5 miles below Nelson Road. Other southern species such as the Tufted Titmouse and Northern Cardinal are especially abundant here. Otherwise, the avifauna is fairly characteristic of high quality floodplain forests along other small rivers in southern Wisconsin. In particular, there are relatively few individuals of species such as Tree Swallow and Warbling Vireo that prefer open woods and sloughs; while there are good populations of more "mesic" or "closed" forest species, including eastern Wood-Pewee, Acadian Flycatcher, Wood Thrush, Veery, Red-eyed Vireo, Louisiana Waterthrush, and Rose-breasted Grosbeak. This tract is outside the range of river birch, and perhaps as a result, Yellow-bellied Sapsuckers are rare or absent.

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