The passenger pigeon. Vol. 58, No. 4 Winter 1996

Madison, Wis.: Wisconsin Society for Ornithology, Winter 1996

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THE PASSENGER PIGEON
Vol. 58 No. 4
Winter 1996

JOURNAL OF THE WISCONSIN SOCIETY FOR ORNITHOLOGY

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The Passenger Pigeon (ISSN 0031-2703) is published quarterly (Spring, Summer, Fall, and Winter) by The Wisconsin Society for Ornithology, W330 N8275 West Shore Drive, Hartland, WI 53029. Subscription rates are: Individual, $15 per year; Family, $20 per year; Sustaining, $35 per year; Library, $18 per year; Life (Single), $300; Life (Couple), $400; and Patron, $750. Back issues may be obtained for $5.00 each. Send back issue and change of address requests to Memberships, W330 N8275 West Shore Drive, Hartland, WI 53029.

Send all manuscripts and correspondence to the Editor; information for "Seasonal Field-Notes" should be sent to the Associate Editor or the appropriate Field-Note Compiler. Manuscripts that deal with information on birds in the State of Wisconsin, with ornithological topics of interest to WSO members, or with activities of the WSO will be considered for publication. All manuscripts submitted for possible publication should be typewritten, double-spaced, and on only one side of page-numbered typing paper. Illustrations should be submitted as photographs or good-quality drawings. Keep in mind that illustrations must remain legible when reduced to fit on a journal page. All English and scientific names of birds mentioned in manuscripts should follow *The A.O.U. Checklist of North American Birds (6th Edition)*. Use issues after Vol. 50, No. 1, 1988, as a general guide to style.

Only One Birder

Acid rain, deforestation of the tropical rainforests, logging of the remaining old-growth forests in the U.S., draining and filling of wetlands, allowing oil drilling in the National Arctic Wildlife Refuge: if your mail is anything like mine, you hear about these, and many other, environmental issues frequently. I don't know about you, but I often feel overwhelmed and frustrated by these national or global problems. What can I, as only one birder, do to change any of them?

Just to make us all feel better, I would like to suggest some actions that can be done by individual birders that will help "our" birds. Here's my list of 10 items. It is not exhaustive, but it's a start.

- Educate yourself about birds, their needs, and what can be done to help them. There are many periodicals and books available on almost every subject related to birds. Public libraries carry some of them, but if you can't find an item you want, call the WSO Bookstore at 414-547-6128 and the Reels will find it for you. You can also attend conferences and symposia sponsored by WSO and other environmental organizations. These provide not only the chance to learn about current research findings, but to talk with other birders and share first-hand experiences.
- Landscape your property in a bird-friendly fashion. There are many publications to help you do this. Obviously managing large grasslands or woods in a manner that helps the birds is important, but so is creating a bird haven in even small backyards. You can plant native plants that supply needed fruits and berries and provide good cover and shelter. Most native plants are much cheaper to acquire than exotics, and easier to maintain. And don't forget to supply some water. A simple shallow birdbath with a heater in winter, or an elaborate fountain, waterfall and pond are all the same to the birds. Just be sure it's safe and clean.
- Find an alternative to chemical pesticides for your property. When I worked at the Oshkosh Wild Birds Unlimited store, I was often asked, "Why don't I have any robins in my yard any more, are they declining? My first response was, "Do you have a lawn care company come in and take care of your lawn?" More often than not, the answer was, "Oh, yes." Not only do chemical pesticides kill the worms and insects the robins and other birds eat, but if the adult birds feed those insects treated with the pesticides to their young, the young are poisoned. This is often a problem along bluebird trails, and can occur anywhere birds are raising young. (Chemicals on your lawn isn't too good for children and pets, either.)
- Keep your cat indoors. Research has shown that the domestic cat is a major predator on birds. This includes not just feral cats, but well-fed lovable

house cats. In fact the well-fed cat has more patience to wait out the hunt than the hungry wild feline. Cats without their front claws are still able to catch and kill many birds. It is also better for the cats if they stay indoors. According to statistics provided by a veterinarian friend of mine, the average life expectancy for a cat that is allowed outside is 3 years, while one that always stays indoors averages 13 years. (Yes, I have two cats and they never go outside.)

- Bird-proof your windows. Another source of many bird deaths each year is windows—from those large expanses of plate-glass high in the sky along the flight paths of migratory birds to those much smaller windows in our homes. Anything that you can do to break up the reflection of the sky and trees in the window helps, silhouettes of raptors, drawing your drapes or blinds, or netting on the outside.
- Buy an endangered resources license plate. This money is used to pay for projects that are for the benefit of non-game species.
- Support our state park system, and buy duck stamps that help provide wildlife refuges. The park and refuge systems provide habitats for many species.
- Participate in bird research projects. There are numerous projects in Wisconsin each year that need people to collect data. They include the Christmas, May Day, and Migration Counts (Christmas Count coordinators can be found in the Spring issues of the *Passenger Pigeon*, May Day and Migration Count coordinators are in the Winter issue), the Nicolet Forest Survey (contact Bob Howe), and the Wisconsin Breeding Bird Atlas (contact me).
- Infect others with your love of birds. Share your knowledge about birds with your friends, take them to meetings and on field trips, introduce them to the birds. In order for "our" birds to be protected into the future more people must care about them and their welfare. To care about them, people must know them. You can make the introductions.
- Maintain your membership in WSO. We have worked hard for 58 years to make WSO the leading bird organization in Wisconsin. For us to continue the effort, we need your support through your dues, attendance at WSO events, your special donations, and your commitment to the projects WSO conducts.

There's my list of 10 things we each can do. What would you add to these ideas? Let me know, and I'll put your list of things that we each can do to help the birds in future issues of *The Badger Birder.*

Bettie Harriman

President

Birds of Wisconsin's Lake Beaches and Dunes

Surveys of Wisconsin birds of Great Lakes' beaches and dunes between 1970 and 1995 revealed a rich assemblage of species representative of several community types. A variety of edge species, and species attracted to open habitats and forest openings, use lake beach and dune communities for foraging and resting, and occasionally, nesting. Shorebirds, gulls, terns, and sometimes raptors, are the most visible avifauna frequenting our Great Lakes' coasts.
Descriptions of habitats and historical perspectives on habitat changes and changes in bird populations, notably the Piping Plover, are discussed.

by Sumner W. Matteson

It is no secret that migrating raptors and shorebirds (Figure 1) are often best observed along Wisconsin's Great Lakes' coasts, and it is along Lakes Michigan and Superior that lake beach and dune communities are best represented, though these communities occur to a much lesser extent at sandy interior lakes (Curtis 1959). This paper, the thirteenth in the series "*Wisconsin Birding: The Habitat Way*," discusses breeding and migratory birds at these coastal communities.

Beaches and dunes covered in this paper refer to sand beaches and dunes, varying from open unvegetated beaches to vegetated dunes, open dune swales, and vegetated sand ridges, which succeed with stabilization to forest cover. For some of the more unfamiliar or obscure terms used, a few definitions are called for (from: Nelson and Nelson 1967, Monkhouse 1970, Tver 1979): 1) *barrier beach*—typically an offshore sand bar or sand ridge parallel to the mainland shore and separated from it by a lagoon that gradually becomes established as the ridge—barrier—is built up by storm waves. 2) *barrier spit*—elongated sandy point of land projecting into the lake (sea) from the mainland and across the mouth

Figure 1. Ruddy Turnstone, Wisconsin Point, Lake Superior. (Photo by Robbye Johnson)

of an estuary or head of a bay. 3) *baymouth bar*—a bank of sand, mud, or stones of varying sizes that extends across a bay, usually linking two mainland promontories to create a somewhat straight coastline. 4) *cuspate foreland*—an island's broadly triangular, low sand promontory formed from the convergence of two opposing sand bars or ridges created by opposing longshore currents. 5) *longshore current*—inshore current that moves essentially parallel to the shore and which is usually generated by waves breaking at an angle to the shoreline. 6) *tombolo*—a sandbar connecting an island with the mainland. 7) *"true" sand spit*—long, fairly narrow sandy point of land or shoal that extends from shore into the lake (sea).

Among the best examples of beach and dune communities are those at: Kohler-Andrae State Park, Point Beach State Forest, Whitefish Dunes State Park, Long Island and Chequamegon Point, Wisconsin Point, and Outer Island in the Apostle Islands. Nesting typically occurs less often at these coastal sites than inland, but management of them as feeding and resting grounds may be just as important as management of nesting habitat in the long-term considerations of bird survival.

Methods

Information on lake beach and dune geology, botany, history, and avian studies was compiled from a variety of sources and cited accordingly in the text. Gleason and Cronquist (1991) was the final authority on plant nomenclature used throughout the paper.

Wisconsin Department of Natural Resources' (DNR) Natural Areas' standardized, single-visit breeding bird surveys, as well as additional surveys/visits to document breeding birds, were conducted during 1970–1995 by volunteers, state and federal agency personnel, and myself, at 24 sites on Lakes Michigan and Superior. (A July visit to Wisconsin Point in 1996 produced additional data.) Data from 132 (standardized and other) surveys at 10 representative sites were compiled for Table 1. A total of 78 single-visit breeding bird surveys in lake beach/dune habitats was used to determine species abundance in Table 2; for this table only those surveys were included where observers recorded habitat associations.

During June and early July 1989–1991, I described the vegetation of 7 lake beach and dune habitat types (strand, foredune, heath-like backdune, backdune grassland/savanna, open dune swale/wetland, forested dune ridge and swale, tombolo/sand ridge) within 50 × 100m transects at 9 sites, with each transect separated from other transects by at least 100m. In each of 4 height classes (0–1m, 1–3m, 3–6m, and >6m), I made ocular estimates (James and Shugart 1970) of percent cover of open ground (including driftwood), vegetation, residual plant material, and water. Birds observed during these surveys are pooled with data from single-visit surveys in Table 2. In field notes, I also made cover estimates of vegetation types and heights during my single-visit breeding bird surveys.

Site descriptions were based on several sources in addition to my observations. These sources were as follows: Bureau of Endangered Resources' (BER) Natural Areas' files (all sites), William Tans' notes and unpublished DNR reports on the flora of the Outer Island Sand Spit and Whitefish Dunes, Reed (1959) on Point Beach State Forest flora, Judziewicz and Koch (1971) on Outer Island and Long Island sandscapes, and Bratley (1971), Koch *et al.* (1979), and Eric Epstein (pers. comm. and *in litt.*) on Wisconsin Point flora. These sites (with the exception of Outer Island Sand Spit), as well as several beach/dune birds, also received mention in *Wisconsin's Favorite Bird Haunts, Revised Edition* (Tessen 1976) and *Wisconsin's Favorite Bird Haunts: Supplement Edition* (Tessen 1979). These latter two publications include maps.

Origin and Maintenance of Beaches/Dunes

About 20,000–35,000 years ago, the ancestral Great Lakes drained into an area north of the present St. Lawrence River. Southern portions of these receding lakes exposed broad lake plains—former lake bottoms with lacustrine soils, primarily sands, as well as coarser, clastic sediments (The Nature Conservancy 1994, Albert 1995), and also iron-rich red clay along the south shore of Lake Superior. Accompanying development of this drainage and the retreat of massive glacial ice sheets was a tilting of the Great Lakes basin (Martin 1965).

The scouring of bedrock sandstones and shales and other sedimentary rock by glacial action, the filling of scoured and dammed basins with water, and the rebound of

Table 1. Maximum number of birds detected at 10 lake beach and dune sites on Lakes Michigan and Superior, Wisconsin, during 28 May–4 July, 1970–1995. Includes observations for adjacent lake and wetland habitats, and forested ridges and swales. PB = Point Beach State Forest, KD = Kohler Dunes State Natural Area, LI = Long Island, WP = Wisconsin Point, OI = Outer Island Sand Spit, JHR = Jackson Harbor Ridges, WD = Whitefish Dunes State Park, MI = Madeline Island, SB = Seagull Bar, SI = Stockton Island. Years and numbers of visits given in Table 4. + = Species present but number not documented during observation period.

Species	PB	KD	LI	WP	OI	JHR	WD	MI	SB	SI
Common Loon			3	1	2			1		
White Pelican			24							
Double-crested Cormorant			7	2	30	28			2	
American Bittern				1				1		
Least Bittern									1	
Great Blue Heron	2		3	10	+	3			3	1
Green Heron	2	1		+						
Black-crowned Night-Heron									12	
Mute Swan				3						
Brant			3							
Canada Goose	5	4	14		+	1				
Wood Duck				7						
Green-winged Teal			6							
Black Duck	1			1						
American Coot				1					1	
Mallard	2	2	53	16		7		2	5	
Blue-winged Teal			3	8		2			4	
Northern Shoveler				1						
Gadwall			3							
American Wigeon			1	2						
Canvasback				4						
Redhead			1							
Greater Scaup				1						
Lesser Scaup			1	5						
White-winged Scoter										
Common Goldeneye						1				
Hooded Merganser				1						
Common Merganser			24		+					
Red-breasted Merganser			8	1	12	9		2		1
Turkey Vulture	1		1		4					
Osprey			1							
Bald Eagle			4	2	2					2
Northern Harrier			2	1	+			1		
Sharp-shinned Hawk					+	1				
Cooper's Hawk		1			+					
Red-shouldered Hawk	1									
Broad-winged Hawk					4	1	2			
Red-tailed Hawk					1					
American Kestrel	1				+					
Merlin	1		1	2	2				1	
Ring-necked Pheasant				1						
Ruffed Grouse	2					2				
Wild Turkey	1									
Virginia Rail			1	2						
Sora				2						
Black-bellied Plover	1		22		3				1	
Lesser Golden Plover			3		1					

(continued)

Table 1. *Continued*

Species	PB	KD	LI	WP	OI	JHR	WD	MI	SB	SI
Semipalmated Plover			15	1	1				2	
Piping Plover			6	4						
Killdeer	4	3	14	19	2	2		1	8	1
Greater Yellowlegs			3		+					
Lesser Yellowlegs			14	2						
Solitary Sandpiper			1							
Willet			1	1						
Spotted Sandpiper	1		10	12	8	7		3	6	1
Upland Sandpiper			1							
Whimbrel			2							
Hudsonian Godwit			1							
Marbled Godwit			14							
Ruddy Turnstone	1		8		21				4	
Red Knot			3		1					
Sanderling	1		140	3	17				1	
Semipalmated Sandpiper			35	4	23				10	
Western Sandpiper			1							
Least Sandpiper			70	2	6				20	
White-rumped Sandpiper			2							
Baird's Sandpiper			1		17					
Pectoral Sandpiper			3							
Buff-breasted Sandpiper			1							
Dunlin	1		47		8				5	
Short-billed Dowitcher			9							
Common Snipe				1	+			3		
American Woodcock				2	1					
Wilson's Phalarope			4							
Franklin's Gull			1							
Bonaparte's Gull	100		33	45	22				1	
Ring-billed Gull	1,000	210	664	190	54	1	1,200		1,000	
Herring Gull	500		206	420	65	30	12		156	2
Caspian Tern	8		192	2		1			40	
Common Tern	2		105	104					15	
Forster's Tern									5	
Black Tern			55	41					20	
Mourning Dove	6	6		4	+	2	4		1	
Black-billed Cuckoo	1	2	1	4						
Yellow-billed Cuckoo				1						
Great Horned Owl						1				
Barred Owl	1				1					
Long-eared Owl			1							
Whip-poor-will							1			
Chimney Swift	2	6		1			1	1		2
Ruby-throated Hummingbird	1	2						1	2	
Belted Kingfisher	3		2		+			2		
Red-headed Woodpecker					1					
Red-bellied Woodpecker						1				
Yellow-bellied Sapsucker				1	+					
Downy Woodpecker	1	1		+	+					
Hairy Woodpecker	5				+	7	3	1		
Northern Flicker	1	1	2	4	+	3	1	1		
Pileated Woodpecker	2					1	1			
Olive-sided Flycatcher	1			1				2		
Eastern Wood-Peewee	7	3	1	1	1	1	8			

(continued)

Table 1. *Continued*

Species	PB	KD	LI	WP	OI	JHR	WD	MI	SB	SI
Yellow-bellied Flycatcher		1			1					
Alder Flycatcher	6		2	5	5			5		1
Willow Flycatcher		1				1			3	
Least Flycatcher	3		1	12	2				1	2
Eastern Phoebe			1	1	+	1				
Great Crested Flycatcher	11	2		3	+	7				
Western Kingbird					1					
Eastern Kingbird	6	6	4	8	2	6		4	7	
Horned Lark			1		2				1	
Purple Martin	2	6		2		1	2		2	
Tree Swallow	6	12	7	544	3	3	6	14	12	6
Northern Rough-winged Swallow	5	1	2	8	+			1	3	
Bank Swallow	12	10	10		+	2			125	
Cliff Swallow	4		5	34		4	5		10	
Barn Swallow	4	7	10	6	2	2			1	
Blue Jay	54	3	13	1	2	21	7			
American Crow	15	6	7	8	2	10	26	2	1	1
Common Raven			5	1	1	1		1		
Black-capped Chickadee	19	8	3	3	11	11	10	3		
Tufted Titmouse	1									
Red-breasted Nuthatch	10		1	3	1	3	1			
White-breasted Nuthatch	2			1	2		6	2		
Brown Creeper	2				+	1				
House Wren	5	5		1			4			
Winter Wren	1	1			1	1				1
Sedge Wren	3				15			1		1
Marsh Wren									15	
Golden-crowned Kinglet			1		+	11				1
Ruby-crowned Kinglet					+					
Blue-gray Gnatcatcher	1									
Eastern Bluebird	2	4	1		5	1	3			1
Veery	16	1	2	5	+		8	5		
Gray-cheeked Thrush					+					
Swainson's Thrush					+					
Hermit Thrush	1				1		4			
Wood Thrush	1				1	1	4			
American Robin	9	9	3	32	1	6	10	1		1
Gray Catbird	7	4	1	6	+	1		3	2	
Northern Mockingbird					2					
Brown Thrasher		2	1	1	+					2
American Pipit					1					
Cedar Waxwing	19	9	40	17	3	48	13	+	5	
European Starling	1	3	1	10	+	6	2		38	
Solitary Vireo	3			+	+				+	
Yellow-throated Vireo	2						3		1	
Warbling Vireo		1		7			4	1	3	
Red-eyed Vireo	18	5	2	7	2	1	11	6		1
Tennessee Warbler				1	2					
Nashville Warbler	1		9	5	5	1		15		5
Northern Parula					+					
Yellow Warbler	4	4	7	11	5	1	1	4	15	1
Chestnut-sided Warbler	7	2	1	7	2		2			2
Magnolia Warbler	1	1			+	2				
Yellow-rumped Warbler	3	4	2	5	3	9	2	6	1	

(continued)

Table 1. *Continued*

Species	PB	KD	LI	WP	OI	JHR	WD	MI	SB	SI
Black-throated Green Warbler	18		4		1	9	6	2		
Blackburnian Warbler	1	1	1	1	1	1	2	2		
Yellow-throated Warbler		1								
Pine Warbler	3		2					2		1
Palm Warbler					+					
Blackpoll Warbler				1	+					
Cerulean Warbler							1			
Black-and-white Warbler	4		1	2	+	8	2	1		
American Redstart	8	1	7	25	2	5	8	6		1
Ovenbird	20			4	1	5	14	3		
Northern Waterthrush	1			1						
Kentucky Warbler				1						
Mourning Warbler	7	1		4	+	1				
Common Yellowthroat	14	6	5	10	4	5	4	8	1	4
Hooded Warbler	1									
Wilson's Warbler					1					
Canada Warbler	7	1		+	3		1	1		
Yellow-breasted Chat							1			
Scarlet Tanager	6				+		1			
Northern Cardinal	6	4								
Rose-breasted Grosbeak	2			1						
Indigo Bunting	8	4			2	2	2			
Dickcissel				1						
Eastern Towhee	3	6			1					
Chipping Sparrow	7	33	5	3	2	2	10	3		2
Clay-colored Sparrow	6	6	2	3	1		3			
Field Sparrow	1	10								
Vesper Sparrow		9								
Savannah Sparrow	2		4	6	+			1		
Grasshopper Sparrow		1					2			
Le Conte's Sparrow				1	+					
Song Sparrow	11	16	11	11	2	6		6	14	5
Swamp Sparrow	3		1	7	1			4	3	3
White-throated Sparrow	2		2	3	2		2	2		
White-crowned Sparrow					+					
Dark-eyed Junco					1					
Lapland Longspur					1					
Bobolink	2	1		67	+					4
Red-winged Blackbird	12	29	50	65	2	3		8	28	
Eastern Meadowlark	1	1			1					
Western Meadowlark			1		2					1
Yellow-headed Blackbird			63	9	+				5	
Rusty Blackbird				2						
Brewer's Blackbird			1	15					4	
Common Grackle	7	6	1	10	+	9	3			
Brown-headed Cowbird	3	7	6	23	+		1	10	4	
Baltimore Oriole	1	3		5	+	1	1	1		1
Purple Finch				6	+	1		1		
House Finch	6	14								
Pine Siskin			5	2	+					
American Goldfinch	20	11	2	4	+	6	2	1	1	
Evening Grosbeak			7	9	+					
House Sparrow	2	2								

Table 2. Comparative abundance of birds detected on breeding bird surveys in 7 lake beach/dune habitats. A = Abundant (occurred on over 75% of sites). C = Common (occurred on 51–75% of sites). FC = Fairly Common (occurred on 26–50% of sites). U = Uncommon (occurred on 11–25% of sites). R = Rare (occurred on 1–10% of sites). **Wetland* means sedge meadow, ephemeral pool, bog, swamp, and interdunal wetland. Numbers in parentheses indicate number of sites surveyed.

Species	sand beach (n = 24)	foredune (n = 15)	backdune grassland/ savanna (n = 10)	heathlike backdune (n = 6)	open dune swale/ wetland* (n = 10)	forested dune ridge & swale (n = 13)	tombolo/ sand ridge (n = 5)	Overall
White Pelican	—	—	—	—	—	—	U	R
Double-crested Cormorant	U	—	—	—	—	—	—	R
Great Blue Heron	—	—	—	—	C	—	—	R
Green Heron	—	—	—	—	FC	—	—	R
Black-crowned Night-Heron	—	—	—	—	—	—	U	R
Canada Goose	U	—	—	—	—	—	—	U
Green-winged Teal	—	—	—	—	U	—	—	R
Mallard	C	—	—	—	FC	—	U	U
Blue-winged Teal	R	—	—	—	FC	—	U	R
Gadwall	—	—	—	—	U	—	—	R
Common Merganser	R	—	—	—	—	—	—	R
Red-breasted Merganser	U	—	—	—	—	—	—	U
Turkey Vulture	—	—	U	U	—	U	—	U
Bald Eagle	R	—	—	—	U	U	—	U
Northern Harrier	—	U	U	—	R	—	—	U
Sharp-shinned Hawk	—	—	—	—	—	R	—	R
Cooper's Hawk	—	—	—	—	—	R	—	R
Red-shouldered Hawk	—	—	—	—	—	R	—	R
Broad-winged Hawk	—	—	—	—	—	FC	—	R
Red-tailed Hawk	—	—	R	—	—	—	—	R
American Kestrel	—	—	R	—	—	—	—	R
Merlin	—	U	FC	FC	—	FC	—	FC
Ring-necked Pheasant	—	—	—	—	—	R	—	R
Ruffed Grouse	—	—	—	—	—	U	—	R
Wild Turkey	—	—	—	—	—	R	—	R
Virginia Rail	—	—	—	—	U	—	—	R

Black-bellied Plover	R	—	—	—	—	—	U	R
Lesser Golden Plover	R	—	—	—	—	—	—	R
Semipalmated Plover	R	—	—	—	—	—	U	R
Piping Plover	R	—	—	—	R	—	—	R
Killdeer	FC	C	C	FC	R	—	U	FC
Greater Yellowlegs	R	—	—	—	R	—	U	R
Lesser Yellowlegs	R	—	—	—	—	—	U	R
Willet	R	—	—	—	R	—	—	R
Spotted Sandpiper	FC	C	FC	—	FC	—	FC	FC
Upland Sandpiper	—	—	R	—	—	—	—	R
Whimbrel	R	—	—	—	R	—	—	R
Hudsonian Godwit	R	—	—	—	R	—	—	R
Marbled Godwit	R	—	—	—	—	—	R	R
Ruddy Turnstone	U	—	—	—	—	—	—	R
Red Knot	R	—	—	—	—	—	—	R
Sanderling	FC	—	—	—	—	—	U	U
Semipalmated Sandpiper	U	—	—	—	—	—	U	U
Western Sandpiper	R	—	—	—	—	—	—	R
Least Sandpiper	FC	—	—	—	—	—	U	U
White-rumped Sandpiper	R	—	—	—	—	—	—	R
Baird's Sandpiper	R	—	—	—	—	—	—	R
Pectoral Sandpiper	R	—	—	—	—	—	—	R
Buff-breasted Sandpiper	R	—	—	—	—	—	—	R
Dunlin	U	—	—	—	—	—	U	R
Short-billed Dowitcher	R	—	—	—	R	—	R	R
American Woodcock	—	—	—	FC	—	—	—	R
Wilson's Phalarope	—	—	—	—	R	—	—	R
Franklin's Gull	R	—	—	—	—	—	—	R
Bonaparte's Gull	U	—	—	—	—	—	—	R
Ring-billed Gull	A	—	—	—	FC	—	C	FC
Herring Gull	C	—	—	—	—	—	U	U
Caspian Tern	U	—	—	—	—	—	U	R
Common Tern	U	R	—	—	—	—	R	R
Black Tern	R	—	—	—	—	—	—	R
Mourning Dove	—	—	C	—	—	C	FC	U
Black-billed Cuckoo	—	—	—	—	—	FC	—	R

(continued)

Table 2. *Continued*

Species	sand beach (n = 24)	foredune (n = 15)	backdune grassland/ savanna (n = 10)	heathlike backdune (n = 6)	open dune swale/ wetland* (n = 10)	forested dune ridge & swale (n = 13)	tombolo/ sand ridge (n = 5)	Overall
Yellow-billed Cuckoo	—	—	—	—	—	R	—	R
Great Horned Owl	—	—	—	—	—	R	—	R
Barred Owl	—	—	—	—	—	R	—	R
Whip-poor-will	—	—	—	—	—	R	—	R
Chimney Swift	R	R	U	U	R	U	R	U
Ruby-throated Hummingbird	—	—	U	—	—	FC	—	R
Belted Kingfisher	—	—	—	—	FC	R	—	R
Red-bellied Woodpecker	—	—	—	—	—	R	—	R
Yellow-bellied Sapsucker	—	—	—	—	—	R	—	R
Downy Woodpecker	—	—	R	—	—	FC	—	R
Hairy Woodpecker	—	—	—	—	—	FC	—	R
Northern Flicker	FC	FC	C	C	U	C	FC	FC
Pileated Woodpecker	—	—	—	—	—	U	—	R
Olive-sided Flycatcher	—	—	—	—	—	U	—	R
Eastern Wood-Pewee	—	—	—	—	—	C	—	U
Yellow-bellied Flycatcher	—	—	—	—	—	U	—	R
Alder Flycatcher	—	—	—	—	C	FC	—	U
Willow Flycatcher	—	—	—	—	U	U	—	R
Least Flycatcher	—	—	—	—	—	FC	—	R
Eastern Phoebe	—	—	U	—	—	U	—	R
Great Crested Flycatcher	—	—	—	—	—	FC	—	R
Eastern Kingbird	—	U	FC	U	C	C	FC	FC
Horned Lark	U	U	R	R	—	—	R	U
Purple Martin	U	FC	U	R	R	U	R	U
Tree Swallow	A	A	A	FC	FC	A	A	A
Northern Rough-winged Swallow	FC	FC	U	U	U	U	C	FC
Bank Swallow	FC	FC	U	R	U	—	FC	FC
Cliff Swallow	FC	FC	—	—	—	—	FC	U
Barn Swallow	FC	FC	FC	FC	FC	—	FC	FC
Blue Jay	—	—	U	—	—	C	FC	FC

American Crow	FC	U	FC	FC	U	A	U	FC
Common Raven	—	—	R	—	R	FC	R	U
Black-capped Chickadee	—	—	FC	—	FC	C	FC	FC
Tufted Titmouse	—	—	—	—	—	R	—	R
Red-breasted Nuthatch	—	—	—	—	—	FC	—	U
White-breasted Nuthatch	—	—	—	—	—	FC	—	U
Brown Creeper	—	—	—	—	—	U	—	R
House Wren	—	—	—	—	—	FC	—	R
Winter Wren	—	—	—	—	—	C	—	R
Sedge Wren	—	—	—	—	FC	—	—	R
Golden-crowned Kinglet	—	—	—	—	—	U	R	U
Blue-gray Gnatcatcher	—	—	—	—	—	R	—	R
Eastern Bluebird	—	—	C	FC	—	—	—	U
Veery	—	—	—	—	—	FC	R	R
Hermit Thrush	—	—	—	—	—	U	—	R
Wood Thrush	—	—	—	—	—	FC	—	R
American Robin	U	U	FC	FC	U	A	U	FC
Gray Catbird	—	—	C	FC	FC	FC	FC	FC
Brown Thrasher	—	—	FC	U	—	FC	U	U
Cedar Waxwing	—	—	U	U	—	A	U	U
European Starling	FC	U	U	R	U	FC	FC	FC
Solitary Vireo	—	—	—	—	—	U	—	R
Yellow-throated Vireo	—	—	—	—	—	U	R	R
Warbling Vireo	—	—	FC	—	U	FC	FC	U
Red-eyed Vireo	—	—	U	—	U	A	R	U
Tennessee Warbler	—	—	—	—	—	R	—	R
Nashville Warbler	—	—	—	—	R	A	R	U
Yellow Warbler	—	—	FC	U	A	R	FC	FC
Chestnut-sided Warbler	—	—	FC	—	R	C	U	FC
Magnolia Warbler	—	—	—	—	—	U	—	R
Yellow-rumped Warbler	—	—	—	—	U	A	—	U
Black-throated Green Warbler	—	—	—	—	FC	FC	—	U
Blackburnian Warbler	—	—	—	—	FC	A	—	U
Pine Warbler	—	—	U	—	—	U	—	R
Northern Waterthrush	—	—	—	—	—	R	—	R
Blackpoll Warbler	—	—	—	—	—	R	—	R

(continued)

Table 2. *Continued*

Species	sand beach (n = 24)	foredune (n = 15)	backdune grassland/ savanna (n = 10)	heathlike backdune (n = 6)	open dune swale/ wetland* (n = 10)	forested dune ridge & swale (n = 13)	tombolo/ sand ridge (n = 5)	Overall
Cerulean Warbler	—	—	—	—	—	R	—	R
Black-and-White Warbler	—	—	—	—	—	FC	U	R
American Redstart	—	—	R	—	C	A	U	U
Ovenbird	—	—	—	—	—	C	—	R
Mourning Warbler	—	—	R	—	—	FC	—	R
Common Yellowthroat	—	—	A	U	A	R	FC	FC
Hooded Warbler	—	—	—	—	—	R	—	R
Wilson's Warbler	—	—	—	—	R	—	R	R
Canada Warbler	—	—	—	—	FC	U	—	R
Scarlet Tanager	—	—	—	—	—	U	—	R
Northern Cardinal	—	—	R	—	—	U	—	R
Rose-breasted Grosbeak	—	—	—	—	—	U	—	R
Indigo Bunting	—	—	FC	—	—	FC	—	R
Dickcissel	—	—	R	—	—	—	—	R
Eastern Towhee	—	—	U	R	—	U	—	R
Chipping Sparrow	—	—	FC	—	—	A	U	FC
Clay-colored Sparrow	—	—	FC	FC	—	—	—	U
Field Sparrow	—	R	U	R	—	—	—	R
Vesper Sparrow	—	R	R	R	—	—	—	R

Savannah Sparrow	—	U	FC	—	—	—	—	R
Song Sparrow	—	U	C	FC	A	FC	C	FC
Swamp Sparrow	—	—	—	—	C	R	—	R
White-throated Sparrow	—	—	—	—	U	FC	—	R
Bobolink	—	R	U	R	—	—	R	R
Red-winged Blackbird	U	U	FC	U	A	R	FC	FC
Eastern Meadowlark	—	R	FC	R	—	—	—	R
Western Meadowlark	—	—	—	—	—	—	R	R
Yellow-headed Blackbird	—	—	—	—	U	—	—	R
Rusty Blackbird	—	—	R	—	—	—	—	R
Brewer's Blackbird	—	—	U	U	—	—	—	R
Common Grackle	U	U	FC	FC	FC	U	R	FC
Brown-headed Cowbird	U	R	FC	R	U	FC	FC	FC
Baltimore Oriole	—	—	FC	—	R	FC	—	U
Purple Finch	—	—	—	—	—	U	—	R
House Finch	—	—	U	—	—	U	—	R
Pine Siskin	—	—	—	—	—	U	—	R
American Goldfinch	—	U	C	FC	FC	FC	C	FC
Evening Grosbeak	—	—	—	—	—	U	—	R
House Sparrow	R	—	U	R	—	U	R	R

the earth's crust as the last ice sheets departed, characterized the period. A tremendous amount of sediment deposition occurred near and around drowned river mouths in lake plains, leading to the formation of sand beaches (technically called sand "berms"), bars, and spits (The Nature Conservancy 1994). Long sand spits, such as Long Island/Chequamegon Point (Figure 2), Wisconsin Point (Figure 3) and Minnesota Point, and Long Point on Lake Erie, were gradually established by accretions of water-borne sand, whose origins were eroded quartzose sandstone (Martin 1965).

Present lake levels were reached about 2,500 years ago (The Nature Conservancy 1994).

Owing to their geologic origins and changeable conditions, Wisconsin's Great Lakes' sand beaches and dunes are dynamic, ancient communities: they have been continually shaped and influenced structurally by sediments transported and deposited by longshore currents over many thousands of years, and by wave action, storm surge, fluctuating water levels, and vegetative succession (often affected by natural events—e.g. fire—or by human-made disturbances).

Sand beaches and dunes depend critically on and are critical to the continued transport of sediments. When this is interrupted, when shoreline development blocks sand replenishment from wave action, the beach will be scoured, and endless, expensive "beach nourishment"

Figure 2. Long Island, with broad Sand Cut in center, forms a barrier spit with Chequamegon Point in lower portion of aerial photo. (Photo courtesy of Apostle Islands National Lakeshore, U.S. National Park Service)

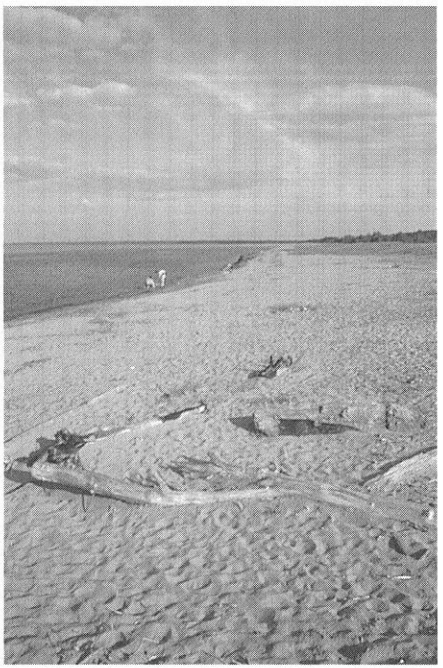

Figure 3. Wisconsin Point. (Photo by Meg Turville-Heitz)

projects may be necessary, typified by the artificial beaches created along Miami's shores (Myers and Ewel 1990). Beach replenishment is extremely costly. The U.S. Army Corps of Engineers participated in 56 major beach nourishment projects between 1950 and 1993 in the U.S. at a total cost of almost $1.5 billion, with almost $900 million coming from the federal government (Dean 1996).

On the Great Lakes, both residential development and recreational traffic pose a threat to the continued viability of lake beaches and dunes. *"This* [threat] *destroys and fragments communities and populations,"* commented The Nature Conservancy (1994), *"impairs system functions such as sand transport and impoverishes natural diversity. Dunes are also prone to accelerated erosion. For example, large, relatively unvegetated blowouts develop into parabolic dunes when pedestrian or vehicular traffic, or removal of overstory vegetation, destabilizes sand and exposes it to wind erosion."*

Onshore winds are also a key factor in dune creation and continuity. Dune sand grains typically range in size from 0.15mm to 0.30mm; grains less than 0.15mm generally present a smooth surface that winds pass over (Jacobson 1968).

"Sand dunes like snow drifts have a gentle slope on the windward side and a steep slope on the leeward side," wrote Jacobson. *"Sand impelled by the wind ascends on the windward slope and comes to rest on the lee side. Thus a dune advances in the direction the wind is blowing by excavation of material from the windward side and deposition on the leeward side. If not arrested dunes would march inland and engulf roads, buildings and villages—a feat they have often accomplished."*

Sand transport and dune formation are also affected by colonizing grasses, such as American beach grass (*Ammophila breviligulata*) on Lakes Michigan and Superior and the dune reed or sand reed (*Calamovilfa longifolia* var. *magna*) on Lake Michigan. Stabilization of shifting, wind-blown sands occurs first by these grasses; these are the dominant stabilizers of Great Lakes foredunes. They may also be present to a limited extent in the upper beach zone, beyond the wash of waves, except in storms. These species grow upward and laterally, outpacing burial by sand. The stems of these grasses stymie the flow of surface winds so that drifting sand grains drop around

and near the colonizing grasses, and contribute to dune build-up. Along Lake Michigan, especially at Point Beach State Forest, stands of little bluestem (*Schizachyrium scoparium*) occur as an intermediate stage in dune colonization between the forest edge and dune crests (Van Denack 1961). Forbs such as beach pea (*Lathyrus maritimus* var. *glaber*), beach wormwood (*Artemisia campestris*), silverweed (*Potentilla anserina*), gray goldenrod (*Solidago nemoralis*), and starry false-Solomon's seal (*Smilacina stellata*), also help stabilize the dune (Curtis 1959, Salamun and Stearns 1978, Judziewicz and Koch 1993).

Plants that adapt to windswept, volatile coastal conditions are especially hardy and responsive to the demanding physical conditions. Sea rockets (*Cakile* spp.), for example, produce a "two-stage" fruit that allows the plant to remain both at the original beach site and to colonize a new one: the bottom half of the fruit detaches during storm wave action and remains buried with dead parent material, while the upper half is carried away to a new site (Myers and Ewel 1990).

Lake dune plant succession—from sand to herbaceous cover, to shrubs or scattered trees, to forest—is similar to succession on inland oak and pine barrens, where fire or some other disturbance may create a blowout area. Lake dunes are arguably more dynamic because of the energetic interplay of an open topography with wind, wave, and ice action.

Description of Habitat Types and Plant Communities

Lake beach and dune communities have continued to evolve during the past 2,500 years. These communities are geomorphologically diverse. Judziewicz and Koch (1993) preferred using the term "sandscapes" when describing sand spits in the Apostle Islands because of the variety of sand landforms present: cuspate forelands on Raspberry, Stockton, and South Twin islands, barrier beaches at Big Bay (Figure 4) and Amnicon Bay on Madeline Island, tombolo on York Island, double tombolo at Presque Isle Point on Stockton Island, beaches, barrier spit—Long Island, and true sand spits at Cat and Outer (Figures 5a and b) islands.

Beach and dune communities exhibit distinct slope profiles as a result of erosion and sediment deposition, with the area from the water's edge (wash zone) to the reach of the highest storm waves, or upper beach, known as the beach zone (also called strand zone or storm beach zone). For purposes of later discussion in relation to birds observed, I refer to the beach zone as the ***strand.*** The strand ranges from open unvegetated beach or mudflat with occasional dead wood and cobble present to <10% grass cover 0–1m tall on upper portions of the sand beach.

Comparing Lake Michigan's and Lake Superior's beaches, Curtis (1959) wrote: *"The beaches of Lake Superior resemble those of Lake Michigan in microtopography but differ considerably in vegetation, with a greatly reduced number of species except in completely protected bays. In fact, long stretches of Lake Superior beach, often several miles in length, can be found which have not a single seed plant except for a few stragglers in areas of buried organic debris."*

Sand beach plants that do occur

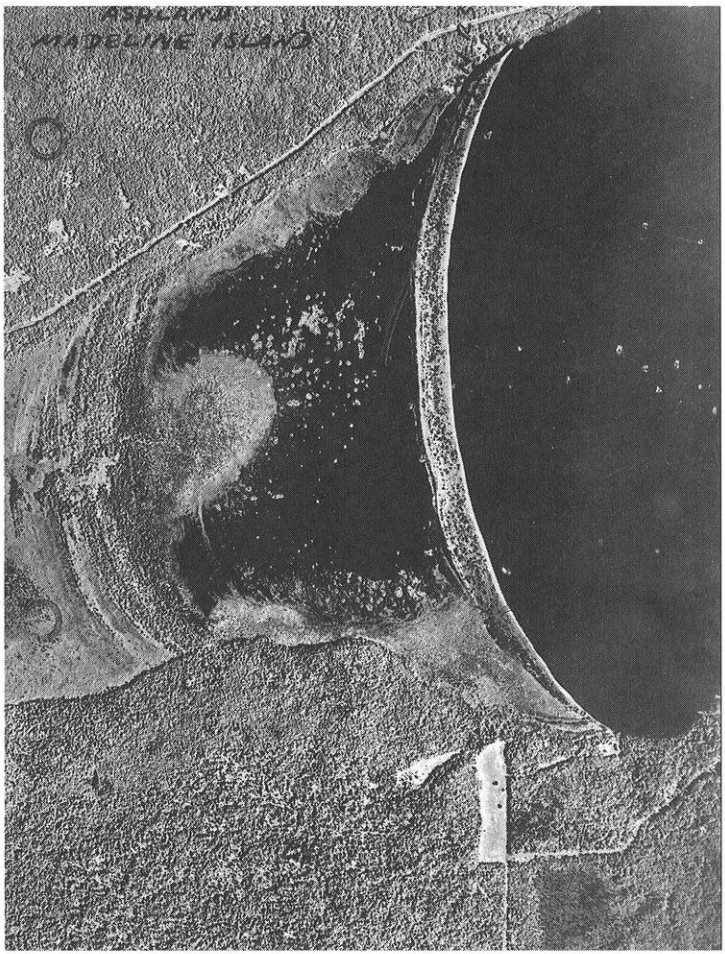

Figure 4. Big Bay, Madeline Island, with barrier beach and lagoon. (Photo courtesy of UW-Madison Department of Landscape Architecture)

are annuals, or short-lived perennials that grow from transient rhizomes or tubers. A fairly large number of species, however, have adapted to the ever-changing coastal conditions (Curtis 1959).

Characteristic or dominant Wisconsin lake beach plants are: sea rocket (*Cakile edentula*), winged pigweed (*Cycloloma atriplicifolium*), seaside spurge (*Euphorbia polygonifolia*), and silverweed. Common associates on Lake Michigan include: beach pea, common horsetail (*Equisetum arvense*), quack grass (*Agropyron repens*), and butter and eggs (*Linaria vulgaris*) (Salamun and Stearns 1978, McEachern 1991). Curtis (1959) noted that *Cakile edentula* occurred in higher densities where concentrations of Herring Gulls loafed but drew no conclusions about the relationship.

Sand beach is comprised primarily

a

b

Figures 5a and b. Outer Island Sand Spit strand and dunes, with beach grass, beach pea, common hairgrass, short-leaf fescue, beach wormwood, common juniper, and sand cherry in stabilized dunes. (Photos by S.W. Matteson)

of sands, but gravel or cobble and gravel comprise portions of open beach at many sites on both Great Lakes. Cobble/gravel beach, that is, a beach dominated exclusively by cobble or gravel, or some combination of the two, is not included in the discussion below.

Walking inland from the strand, I have found that the dune fields of Lake Michigan and Superior exhibit variations of the following habitat types that can be associated with lake beach and dune avifauna: 1) young (active) dune—***foredune***—sloping back from the beach, with up to 70% grass and forb cover 0–1m tall and no trees; sometimes bordered on the landward side by 2) mud flat or ***open dune swale/wetland***—defined here as wet depression, ephemeral pool, sedge meadow dominated by sedges (*Carex*) and rushes (*Juncus*) in early successional stages, (rarely) interdunal wetland, and/or alder thicket; then, a stabilized backdune, sometimes preceding a dune swale/wetland, featuring 3) ***heath-like backdune***-- dominated by mat-forming trailing (creeping) juniper (*J. horizontalis*) and common juniper (*Juniperus communis*), 0–1.2m tall (55–80% cover), interspersed with grasses, forbs, and lichens that present a heath-like aspect; and/or 4) ***backdune grassland/savanna,*** punctuated by blowout areas and featuring a mix of grasses, forbs, shrubs, and areas with "dune copse"--saplings 3–6m tall and/or trees >6m comprising 10–30% cover, which grade into a 5) ***forested dune ridge/swale***—old dune ridge dominated by a mix of conifers and hardwoods >6m, with occasional openings or clearings in the canopy due to the effects of fire or senescence. Forested swales sometimes included swamps or bogs. A variant ridge is the 6) ***tombolo/sand ridge***—occurring on southwestern Long Island and Seagull Bar, and at Stockton Island; vegetative cover ranged from open and sparse on Long Island and Stockton Island on Lake Superior to tree/sapling/shrub-dominated on Lake Michigan's Seagull Bar (Figure 6).

Lake dune plants, as one might expect, are highly xerophytic, but in the swales occur mesophytes, or hydrophytes if standing water is present or if a depression is close to the water table. As indicated above, open swales vary in type from ephemeral pools and wet areas to established sedge meadows. Rushes (*Juncus* spp.)—particularly wire-rush or lakeshore rush (*Juncus balticus* var. *littoralis*), sedges (*Carex* spp.), and bladderworts (*Utricularia* spp.) predominate in the early successional stages. A very rare type of swale is the interdunal wetland, described by The Nature Conservancy (1994) as an "alkaline shoredune pond-marsh."

(Note: The terms "Lake Michigan only" and "Lake Superior only" used below refer *only* to a comparison of plant species occurrence for the Wisconsin shores of Lakes Michigan and Superior and are not meant to imply limited presence elsewhere.)

Typically, dunes encompass interdunal wetlands, which may feature several rare plants, notably: 1) selago-like spikemoss or northern spikemoss (*Selaginella selaginoides*) (state endangered species) (Lake Michigan only), 2) marsh grass-of-parnassus

Figure 6. Flooded eastern tip of Seagull Bar, Lake Michigan, 6 June 1990. Randy Hoffman is set to "broad-jump" stream. (Photo by S. W. Matteson)

(*Parnassia palustris*) (state endangered) (Lake Superior only; also inland in Douglas County), 3) dwarf lake iris (*Iris lacustris*) (federally threatened, state threatened) (Lake Michigan only; see Salamun and Stearns 1978)—discovered by naturalist Thomas Nuttall on Mackinac Island, Lake Michigan, in 1810 (Guire and Voss 1963), 4) false or sticky asphodel (*Tofieldia glutinosa*) (state threatened) (Lake Michigan only and inland), 5) Garber's sedge (*Carex garberi*) (Lake Michigan only—documented by R. Moran at Kohler Dunes, 29 June 1978; BER files), 6) lenticular sedge or shore sedge (*Carex lenticularis*) (state threatened), 7) variegated scouring rush (*Equisetum variegatum*) (state species of special concern), 8) small fringed or lesser fringed gentian (*Gentianopsis procera*) (state species of special concern) (Lake Michigan only), 9) bird's-eye or Mistassini primrose (*Primula mistassinica*)—typically found on rocks, cliffs, and gravel shores (Gleason and Cronquist 1991) but noted by Salamun and Stearns (1978), 10) Ohio goldenrod (*Solidago ohioensis*) (state species of special concern) (Lake Michigan only), 11) small purple bladderwort (*Utricularia resupinata*) (state species of special concern), 12) Robbins spike-rush (*Eleocharis robbinsii*) (state species of special concern), and 13) slender arrow-grass (*Triglochin palustre*) (state species of special concern) (Salamun and Stearns 1978, E. Epstein *in litt.*, Bureau of Endangered Resources 1993a,b).

The BER's Natural Heritage Inventory (1993b) lists 10 lake dune

plants, three of which also occur on lake beaches, as state endangered or threatened. They are: sand reed (threatened); Garber's sedge (threatened); dune thistle (*Cirsium pitcheri,* state and federally threatened), also known as Pitcher's thistle, named after its discoverer, Dr. Zina Pitcher, who apparently found the plant when he served as an army surgeon from 1822 to 1837 while stationed at Fort Brady on eastern Lake Superior (Guire and Voss 1963); thickspike (or dune) wheatgrass (threatened) (*Agropyron dasystachyum* var. *psammophilum*); northern commandra (*Geocaulon lividum*) (endangered); dwarf lake iris; clustered broomrape or sand cancer-root (*Orobanche fasciculata*) (threatened); sand dune willow or heart-leaved willow (*Salix cordata*) (endangered); dune goldenrod (*Solidago spathulata* var. *gillmani*) (threatened)—on both lake beach and lake dune; and Lake Huron tansy (*Tanacetum huronense*) (endangered, probably extirpated)—on both lake beach and lake dune. Nuttall discovered Lake Huron tansy during the same 1810 expedition to Mackinac Island where he found dwarf lake iris (Guire and Voss 1963).

Regionally, the Nature Conservancy (1994) has identified 131 elements in the Great Lakes basin that are "critically imperiled or rare on a global scale." Thirty-one of these elements are natural community types; among these is the interdunal wetland. The sand dune, however, is among the most prominent. Important endemics include dune thistle; Houghton's goldenrod (*Solidago houghtonii*), discovered by botanist Douglass Houghton in 1839 on the north end of Lake Michigan (Guire and Voss 1963); and an insect, the Lake Huron locust (*Trimerotropis huroniana*). These species join the open beach/foredune obligate Piping Plover as federally listed species.

Characteristic open dune/sand ridge plant species on Lake Michigan include: sand reed, thickspike wheatgrass, beach grass, beach pea, silverweed, evening-primrose (*Oenothera oakesiana*), Canada wild-rye (*Elymus canadensis*), beach wormwood, common milkweed (*Asclepias syriaca*), starry false Solomon's- seal, and gray goldenrod. Common associates include: yarrow (*Achillea millefolium*), sand (rock) cress (*Arabis lyrata*), horseweed (*Conyza canadensis*), draba (*Draba reptans*), rough fleabane (*Erigeron strigosus*), boneset (*Eupatorium perfoliatum*), horsemint (*Monarda punctata*), Canada blue grass (*Poa compressa*), sand cherry (*Prunus pumila*), pin cherry (*Prunus pensylvanica*), smooth (meadow, wild) rose (*Rosa blanda*), bush-honeysuckle (*Diervilla lonicera*), sand dune willow, sandbar-willow (*S. interior*), shining willow (*S. lucida*), broadleaf willow (*S. myricoides*) (Lake Michigan only), poison ivy (*Rhus radicans*), summer grape (*Vitis aestivalis*), and (locally) little bluestem (Guire and Voss 1963, Salamun and Stearns 1978, McEachern 1991, Bureau of Endangered Resources 1993a).

Also occurring on open Lake Michigan dunes, typically foredunes, are: dune thistle, dune goldenrod, American dunegrass (*Elymus mollis*), clustered broomrape, and sand coreopsis (*Coreopsis lanceolata* var *lanceolata*)—state species of special concern (Salamun and Stearns 1978,

Bureau of Endangered Resources 1993b).

Characteristic open dune species on Lake Superior (prominently in the Apostle Islands) include: beach grass with common associates beach pea, beach wormwood, false-heather (beach heath) (*Hudsonia tomentosa*), common juniper, trailing juniper, sand cherry, common hairgrass (*Deschampsia flexuosa*), Canada wild-rye, a fescue (*Festuca saximontana*), ticklegrass (*Agrostis scabra*), sand cress, bastard-toadflax (*Comandra umbellata*), evening primrose, fireweed (*Epilobium angustifolium*), Canada goldenrod (*Solidago canadensis*), and roses (*Rosa* spp.), particularly smooth rose (Judziewicz and Koch 1993, Bureau of Endangered Resources 1993b).

Notably absent from dune fields in the Apostle Islands are prairie plants and plants from the jack pine barrens community (Judziewicz and Koch 1993).

With dune stabilization on backdunes, mat-forming shrubs such as trailing and common junipers are prominent. Other common backdune shrubs include sandbar willow, shining willow, sand dune willow (dominant on Long Island dune crests), slender willow (*Salix gracilis*), broadleaf willow (Lake Michigan only), roses (*Rosa* spp.)—particularly smooth rose, sand cherry, and locally, poison ivy.

Lichen heaths are also prominent on backdunes, especially in the Apostle Islands where the reindeer mosses *Cladina mitis, C. rangiferina, C. chlorophaea,* and *C. cristatella* are most common (Judziewicz and Koch 1993). False-heather and blueberries (*Vaccinium* spp.) are also typical heath plants. Occasionally, locally, bearberry (*Arctostaphylos uva-ursi*) on both lakes, and Canada yew (*Taxus canadensis*) on Lake Michigan, are prominent (Salamun and Stearns 1978, Judziewicz and Koch 1993). Ericaceous species become established in low-moisture, acidic conditions. Noted Jacobson (1968): *"These* [woody shrubs and semi-woody herbaceous plants] *first appear scattered among the grasses and forbs . . . and often initially take hold at the edge of a swale or on the leeside of a dune."*

In addition to the backdune heath zone, a mix of grasses and forbs, interspersed with shrubs and scattered saplings and trees comprise a backdune savanna zone.

Locally, on Lake Michigan, rare or endangered species such as northern comandra, dwarf lake iris, smooth phlox (*Phlox glaberrima* ssp *interior*), and low nut-grass (*Scleria verticillata*), occur on stabilized dunes and ridges (Salamum and Stearns 1978).

Succession leads to a forested dune ridge with dominance by xerophytic trees, particularly Hill's oak (*Quercus ellipsoidalis*), red pine (*Pinus resinosa*), and jack pine (*P. banksiana*) on Wisconsin's Lake Superior dunes and red oak (*Q. rubra*) on Wisconsin's Lake Michigan dunes.

Saplings and trees that are often common or present on stabilized dunal systems include: cottonwood (*Populus deltoides*) (Lake Michigan only), white pine (*Pinus strobus*), red pine, hemlock (*Tsuga canadensis*), balsam fir (*Abies balsamea*), white cedar (*Thuja occidentalis*), quaking aspen (*Populus tremuloides*), balsam poplar (*P. balsamifera*), American beech (*Fagus grandifolia,* especially at Whitefish Dunes), (locally) sugar maple (*Acer saccharum*), red maple

(*A. rubrum*), paper birch (*Betula papyrifera*), and white ash (*Fraxinus americana*) (Lake Michigan only).

Naturally, open, young lake dunes do not have the structural diversity associated with older stabilized dunes and ridges. And old forested dune ridges are structurally far more complex, with second growth oak and pine forests and some boreal elements predominant on Lake Superior. Along Lake Michigan, northern mesic forest elements occur north of Sheboygan County; southern mesic forest elements occur in fragments from Sheboygan to Racine counties (Curtis 1959, Salamun and Stearns 1978); and oak savanna and prairie remnants occur in association with beaches and dunes in Racine and Kenosha counties (Van Denack 1961).

At the Kenosha Sand Dunes, Sanders (1969) depicted successional zones that began with the storm beach, followed by a grassy and shrubby foredune (geologically 6,000 years old), then a cottonwood-oak dune ridge complex (8,000 years old), then wet prairie, then, further inland, an old (10,000 years) oak-maple dune ridge.

Along western Lake Michigan, lake dunes occur amidst lacustrine ridges and swales paralleling the old shoreline; they are all part of 2 to 3km-wide bands along ancestral Glacial Lake Chicago, which lay about 17m higher than present levels (Sanders 1969, Albert 1995). To the south, in Indiana, the dunes developed from a similar beach-ridge origin, but they arose during a period that pre-dated the western Lake Michigan shore development. Storm winds played an important developmental role as well. Southern Lake Michigan dunes are exposed directly to strong northwesterly winds sweeping across the lake, whereas western Lake Michigan dunes, especially those at Point Beach, which projects out into Lake Michigan, experience winds from several different directions. The resultant effect: a series of relatively low ridges and blowouts at Point Beach (Figure 7), Kohler Dunes State Natural Area (Figure 8) and other western Lake Michigan dunes, compared to dunes that reach 60–120m high along Lake Michigan's southern shores.

More often than not, similarities between Lake Michigan south shore dunes and western Lake Michigan lake dunes are evident, especially when comparing similar dune pioneering and stabilizing plants. As Van Denack (1961) noted: "The same pioneer grasses are prominent: beach grass, sand reed grass, and little bluestem. The same juniper and bearberry mat-formers; willow, poplar, and juniper shrubs; pioneering birches, pines, and white cedar are found; and the dominant hemlocks occur in both the northern and southern locations."

At Point Beach State Forest, Van Denack described six kinds of beach and dune habitats, beginning with the strand zone:

> *"a) the undulating strand extend*[s] *from the lake to the first dunes, b) the foredune ridge (1.3–3 m high except where obliterated by high lake-level wave action) extend*[s] *in a line down the beach . . . c) the interdune trough* [contains] *small hillocks of sand blown in by southwesterly winds, d) the main or front-dune ridge* [is] *broken in a series of hills 3–8 m high by southwesterly or northeasterly winds, e)*

Figure 7. Small interdunal wetland encompassed by grass-and-juniper dominated backdunes adjacent to northern hardwoods and pines at Point Beach State Forest. (Photo by S.W. Matteson)

> [then there is a] *maze of compound blowouts and sand draws, f)* [and then] *the back rim of the blowout area lead*[s] *rather abruptly to the forest margin."*

Van Denack's general description is as applicable today as it was in the early 1960's (though plant succession is much more evident on dune ridges), largely due to the active state of Point Beach's dunal system, which has been influenced markedly by the area's low topography, the Point's geographic protrusion into Lake Michigan, and the area's history of intensive logging in the 1860's and 1870's.

Habitat Changes: Historical Perspectives

Point Beach and Lake Michigan shore—At the time of the original land survey of the Point Beach area in the mid-1830's, the area adjacent to where the current lighthouse stands was dense with white pine, hemlock, black ash (*Fraxinus nigra*), and American beech. About a mile north of the lighthouse, the forest along the dune ridge was dominated by what one surveyor called "rolling" hemlock, with mixed stands of white pine, fir, white birch, beech, and white cedar present. North of the current state forest boundary the surveyor noted *"the land adjoining the lake . . . is high rolling, sandy. Covered with white pine."* South of the lighthouse, about a mile south of Molash Creek, the dune ridge was covered with hemlock, black ash in the swales, and beech and white birch; there was a *"thick undergrowth of*

Figure 8. Backdunes at Kohler Dunes State Natural Area, punctuated by sand blow-outs, with common and trailing junipers, sand reed, beach grass, Canada wild-rye, little bluestem, common fleabane, beach wormwood, thickspike wheatgrass, sand cress, sand cherry, and silverweed characterizing the open vegetation. (Photo by S.W. Matteson)

[white] *pine."* The land around Molash Creek was *"rolling,* [with] *hemlock, birch, beech, black ash, and* [white] *pine."* Speckled alder (*Alnus rugosa*) was also present in the swales.

The Point Beach region in the 1850s was renowned for its vast stands of hemlock. The use of hemlock for its bark and lumber, stated Van Denack, *"gave rise in the 1860's to a thriving tanning industry on the site of the original village of Two Creeks, 5 miles north of Point Beach."* Van Denack summarized what happened in subsequent years:

> *"Encouraged by the Pfister and Vogel leather tannery, the villagers logged the hemlock extensively within a radius of 12 miles. By 1863 the little village had become a thriving port, shipping hemlock bark to other ports by a fleet of lake steamers. In obtaining the bark, the tree was felled, and the wood sold for ties. So intensive was this logging that within 20 years the hemlock bark supply was exhausted, and the leather company had to resort to importing bark for its tanning purposes.*
>
> *"The great fire of 1870 (known locally as the 'Peshtigo fire' because it began near the town in Marinette County) further destroyed the timber. Under pressure of high wind, the fire swept along the shores of Green Bay and spread through Brown, Kewaunee, and Door counties and across the northern part of Manitowoc County where Point Beach is now located.* [There] *about half the timber was 'burnt out' and . . . at a later period other fires also raged in the neighborhood."*

There are no reliable published estimates of the presettlement size of

Wisconsin's lake dune and beach communities, but based on accounts from historians, naturalists, and early ornithologists, the communities were extensive along portions of Lake Michigan and well represented (as they are today) along southern and western Lake Superior.

Among the early writers of this century, Goldthwait (1907) provided the only extensive written account of Lake Michigan beaches and dunes, notably deforested in some places. In 1905, he spent the months of July, August, and September, and well into the fall, traversing the Lake Michigan shore from Kenosha County north to Washington Island, around the peninsula down to Green Bay and then up to Marinette. Most of this journey was spent on foot, but he used "gasoline fishing boats" to maneuver the northern Door County coast, and took a train at some point south of Manitowoc and also north of Green Bay. Where beaches were prominent, he recorded detailed measurements of their height.

Goldthwait's description of areas south and north of Two Rivers in Manitowoc County, including portions of what is now Point Beach State Forest and the Point Beach Scientific Area, is noteworthy:

"South of the town of Two Rivers the low red clay upland slopes gently toward the shore, and is bordered by a swamp and an outer belt of dunes. It seems likely that these dunes are in part shore deposits of higher stages, worked over by the wind; but no definite beaches were found there.

"Northeast of the town this dune belt broadens and forms a wide coastal belt of sand hills, enclosing many acres of swampy woodland, between Two Rivers and the lighthouse.

"A mile northeast of town, behind the dunes, an old terrace and bluff of a 17-foot stage appears on the west side of the shore road opposite the ball grounds. This is the first remnant of an abandoned shore-line north of Centerville, 15 miles away. After following the bluff for a short distance, the road passes along a series of beaches of gravel and sand—two well marked ridges on the western side, rising more than 20 feet above the level of the lake, and lower, flatter beaches on the eastern side, ranging from 10 to 15 feet in altitude. Farther on, near J. Wilsman's house, the beaches attain their best development, the highest rising to 26 feet above the lake, with an unusually steep back slope, a second ridge at 23 feet, and several lower bars in the fields east of the road. At this point the road rises to the crest of the highest bar and follows it rather closely until it breaks up into the dunes. Behind the 26-foot beach, several rods northwest of Mr. Wilsman's house, higher dune-like ridges of sand may be followed through the woods to Molas [sic] Creek, where they join the dunes already mentioned, near the road. These dunes are rather high, rising probably 50 feet above the lake, usually irregular in outline, but with occasional ridge-like form that suggests the presence of beaches higher than the 26-foot level. They are no doubt the product of the extinct lake. . . .

"From Molas [sic] Creek northward to the lighthouse the shore passes through a wilderness of sand hills, where deforesting within the last thirty years has allowed the wind to freshen up the dunes into a state of active existence. Along the outer border of the dune belt, north of the lighthouse, the lake is rapidly cutting back into the sand hills, and exposing their thinly stratified structure."

In southeastern Wisconsin, along open sandy lands west and south of

Kenosha, Goldthwait took a train north from the Illinois border along dune ridges adjacent to extensive beaches, where the state endangered Piping Plover used to nest, and which today is lined with miles of concrete and stone riprap. He wrote: *"North of the State* [Illinois] *line the railroad obliquely ascends the bluff by a long grade, and thence to Kenosha follows slightly higher ground, among indistinct beach ridges and dune ridges. . . . The road to Kenosha at* [section 28] *follows a ridge whose crest is 48 feet above the lake. . . . The greater height at this point may be due to the accumulation* [of] *wind-blown sand. The extension of these beaches has been traced by Alden and others. The highest Glenwood beach lies about a mile and half west of the city. . . . In places the beach gives way to a terrace and low bluff of till."*

Effects of habitat changes on the Piping Plover and other shorebirds—In 1924, the beaches and dunes south of Kenosha were still relatively undisturbed and Gromme (1924) (Figure 9) described the "plover" beach at Chiwaukee as *"very broad and gravelly in places, and typical for piping plover, of which we observed about a dozen."*

The dunes south of Kenosha were especially impressive. In 1930, about 10km south of Kenosha, Gromme (1930) photographed a Piping Plover nest (Figure 10) and observed that *"back 100 feet from the shore the dunes rise and extend inland for nearly a mile. The area is wild and probably extends for several miles along the shore. Piping plover nest* [was] *a depression in sand lined with tiny bits of gravel and containing 4 eggs."*

Not only were the dunes impressive in the 1920's and early 1930's, but portions of the southeastern Wisconsin shore still reflected its presettlement character: a rich mosaic of open, sparsely vegetated beaches, dunes, and dune ridges adjoining prairie and oak openings. But marked changes were coming with creeping urbanization. For the Piping Plover, its days were numbered. The Milwaukee Public Museum's Herbert Stoddard (1923) wrote:

"Suspecting that the rare Piping Plovers might be nesting on a certain stretch of beach, a short distance south of Kenosha, Clarence Jung and the writer made a special trip to investigate on May 28th of this year. After considerable search each found a nest, and another was located by the writer on June 4th. . . . About four pair frequented this locality, which seems to be the only remaining breeding spot on the Wisconsin shore of Lake Michigan, south of Green Bay. It is very doubtful whether this little colony will survive much longer, as the whole district is ripe for development, which indeed has already commenced."

Stoddard delighted in the birdlife associated with this undisturbed prairie/lake beach/dune complex. He observed 200 each of "rare" Black-bellied Plovers and Ruddy Turnstones *"with a lesser number of Red-backed Sandpipers* [Dunlin] *. . . feeding in mixed flocks on the low knolls and around the sloughs of the prairie that parallels the lake shore for a considerable distance at this point. These prairies are entirely uncultivated, and the original prairie flora still persists. It astonished us greatly to see the beach-loving Turnstones feeding on the closely-cropped knolls fully a quarter of a mile from their usual habitat."*

But for Stoddard these observa-

Figure 9. Owen J. Gromme banding a Sanderling at Cedar Grove shore, 2 September 1926. (Photo courtesy of Milwaukee Public Museum)

tions were bittersweet; he was troubled by what was happening to the region: *"Bartramian Sandpiper or Upland Plovers were also quite numerous, a few of which were breeding. Their attractive calls, mixed with the mellow whistles of four varieties of true Plovers, filled the air with wild melody. . . . All the data on the shore birds frequenting this strip of original prairie should be gathered next spring before it is too late. The growing industrial towns of Waukegan and Kenosha have already changed the character of much of this flat strip of lake shore. A recent real-estate development known as 'Chiwaukee' on the south border of that part of the prairie favored by the shore birds, points to further changes. The right of way of an electric railroad promises to divide lengthwise the already narrow strip of prairie. In fact, the whole western shore of Lake Michigan, from Green Bay on the north to the Indiana Dunes on the south seems to have been suddenly 'discovered.' Cottages and subdivisions are springing up everywhere and competing with the factories for the last remaining strip of shore line."*

Gone today are the undisturbed beaches and expansive dry prairies adjacent to lake shore dunes.

Long Tail and Little Tail Points— Two other Lake Michigan sites have suffered too, but for a different omnipresent reason. Long Tail Point and Little Tail Point in lower Green Bay have historically at times contained long stretches of sandy beach, but periodic high lake levels combined with seiche activity and storm surge have significantly reduced or eliminated sand beach habitats as

Figure 10. Nesting Piping Plover, with clutch of 4 eggs, at Edithton Beach, 6 miles south of Kenosha, 10 June 1930. (Photo by Owen J. Gromme, courtesy of Milwaukee Public Museum)

well as significant amounts of emergent wetlands. In the 1920's, for example, lake levels were quite low. Gromme (1923) described Little Tail Point during an outing with the Milwaukee Public Museum: "*. . . a narrow strip of land, extends diagonally out into Green Bay for nearly a mile. . . . The entire south side of Little Tail is composed of low boggy ground, and the bulrushes grow out in the shallow water of the bay for a hundred yards or more, while the center is high and dry, overgrown with tall grass and thickets. The north side for its full length, is bordered by a broad sandy beach, and many bars and shallows which were every day frequented by hundreds of Bonaparte and Herring Gulls which could be seen all day long either flying up and down the beach or noisily squabbling out on the bars. . . . This type of beach was well suited to the Spotted Sandpipers and their cheery calls could be heard most any time as they flew up ahead of us, and out over the water. The heavy growth of bushes and grasses offered abundant shelter for their nests, several of which we found and photographed.*"

Long Island/Chequamegon Point—For economic and geographic reasons, the Wisconsin Lake Superior shore, with the exception of the Duluth-Superior and Ashland areas, has not experienced the same extent of development as that witnessed along the Lake Michigan shore, although recreational use has been steadily increasing as individuals increasingly seek remote sites to recreate. Arguably the best example of a lake beach

and dune system occurs on Long Island/Chequamegon Point (Figure 11), an area nearly as pristine today as when Native Americans first occupied it. And Long Island and the northwestern tip of Chequamegon Point will remain so in perpetuity due to its status as part of the Apostle Islands National Lakeshore.

Bona (1990) speculated that Long Island came into existence as a barrier spit 1050–1700 years ago when the Kakagon River shifted its mouth from Chequamegon Bay to its present site on Lake Superior. Some time in the 1490's, perhaps the same year that Columbus "discovered" America, a nomadic Ojibwa clan—part of the Crane totem family—discovered Chequamegon Point (Warren 1974), then as now a long, slender peninsula that shapes the eastern reaches of Chequamegon Bay on Wisconsin's Lake Superior shore, and one of the state's major staging areas for migrating shorebirds.

"The Cranes," wrote ethnographer William Warren in 1852, *"claim the honor of first having pitched their wigwams, and lighted the fire of the Ojibways, at Shaug-ah-waum-ik-ong, a sand point or peninsula lying two miles immediately opposite the Island of La Pointe* [Madeline Island]. . . . *In former times the distance is said to have been much less, the action of the waves having since gradually washed away the sand of which it is composed."*

The Ojibwa apparently did not remain encamped on Chequamegon Point for long, since war parties of their enemies, the Fox and Sioux, threatened to interrupt their peace. They sought refuge instead on Ma-

Figure 11. WDNR wildlife manager Fred Strand (during Piping Plover survey) walking the southeastern edge of the Sand Cut, Long Island/Chequamegon Point, 2 June 1983. (Photo by S.W. Matteson)

deline Island (home of the "Golden-breasted Woodpecker" [Northern Flicker]), periodically canoeing across to Chequamegon Point to hunt elk, moose, deer, bear, and waterfowl (Warren 1974). It was here on the western end of Chequamegon Point that a fierce battle occurred between the Ojibwa and Sioux.

The following brief account leaves a strong impression of rolling sand topography perhaps considerably more inclined and elevated than at present. *"At the time,"* several hundred years ago, wrote Warren, the *"extreme western end where the* [Sioux] *lay in ambush, is said in those days to have been covered with numerous sand hillocks, which the winds and waves have since nearly blown and washed away. Early one morning, two Ojibwa lads crossed over to the point to hunt ducks: on landing they were attacked . . . with loud yells. For some time the two youths, protected by the numerous sand-hills, defended themselves, and evaded the attempts of their enemies, who wished to take them captives."*

Since the early 1800's or about 1840 (Martin 1965, Bona 1990), the western end of the Chequamegon Point peninsula has periodically opened to Lake Superior as a result of storm surge and high water levels. The 6.4km stretch of land standing apart from the peninsula was, accordingly, named Long Island. The gap separating the two pieces of land became known as the "Sand Cut," with water only about .5 to 1.2m deep (Martin 1965). At the time of the original land survey in 1852, the vicinity of the Sand Cut area was apparently free of water and was described by a surveyor as *"sand prairie covered with a light growth of grass."*

In 1929, Ashland historian Guy Burnham (1930) wrote:

> *"The writer . . . remembers visiting Long Island during the early nineties. . . . There was a breach right through the island to the open lake, and the engineers, from an annual appropriation for that purpose, were trying to stop this breach from getting larger by dumping, as we remember, stone and slabs and other material. But it seemed impossible to fill the gap, which was a half mile or so in width. While the water was shallow where the break had occurred, the filling quickly disappeared in the sand."*

In 1974, Jim Harris and I waded across a narrow channel of hip-deep water to reach Long Island while surveying the Wisconsin shore of Lake Superior for nesting colonial waterbirds. We found 2 pairs of Piping Plovers, one each on Long Island and Chequamegon Point (Harris and Matteson 1975). Since 1975, the breach between the island and Chequamegon Point has been closed (McEachern 1991).

Long Island, part of the region's glacial lake plain, varies from 75 to 380m wide and comprises 12 parallel sand ridges reaching 4.6m high that alternate with swales at or below lake level (McEachern 1991). At the time of the original land survey in 1852, the ridges were dominated by a forest composed of red pine, white pine, white birch, and quaking aspen, alternating with alder thickets and sphagnum-sedge bogs in the swales (Bona 1990, Judziewicz and Koch 1993). Judziewicz and Koch (1993) also believe that oaks and jack pine were present. The original land surveyor considered the soil to be "third rate" as the surveyors so often did when describing areas with sandy soils. *"Long Island is mostly a*

sandy pine barren but will be . . . sold for fishing and other purposes," wrote the surveyor in 1852.

Poor soils, alder thickets, and bogs deterred logging and farming on the island. Historically, at least since the advent of merchant forts and trading centers in the area from the mid-1600's through the 1830's, Long Island was used seasonally. The U.S. Coast Guard built the "Old LaPointe" lighthouse in 1858 in a northwestern section of the island, then 40 years later moved it to the island's northwestern tip. A second LaPointe lighthouse, equipped for three families, was built on the eastern shore in 1938 and used for several years. A few families have also had small inholdings on the island over the past 200 years; about 40 acres remain in private ownership, but the rest of the island was acquired by the National Park Service in 1986 (McEachern 1991, J. Van Stappen pers. comm.).

Birds of Sand Beach and Dune Communities

One might think the avian community to be depauperate on lake beaches and dunes and adjacent community types during the breeding season. Jung (1930), however, made this observation during a June outing on eastern Lake Michigan: *"A walk along a sandy shore, however, unfolds new delights. Before you, a spotted sandpiper flutters in a pitifully helpless manner, the telltale of a carefully hidden nest. A savannah sparrow tries to sneak quietly through tall grass in order to attract the intruder away from her naked little ones. Into the knot hole of a dead poplar disappears a flicker, to feed her young. At the edge of a clump of cat-tails a fuzzy little black powder puff with enormous feet, tells of the family interests of a sora rail. There is no end of nests and nestlings now."*

Lake beach and dune avifauna, due to the variety of lake dune microhabitats and edge components, the influence of adjacent habitats, and the interrelated factors of geography, climate, microclimate, edaphic factors, and plant succession, reflects a mixed bird diversity representing elements from other community types described in this series, especially prairies, all northern forest types, pine-oak barrens, and savannas. As a result of all these factors, many species are present during the breeding season, typically foraging or loafing, and few may be actually nesting. A total of 208 species were documented (Tables 1 and 4) for this paper, including many late migrants.

Breeding birds inhabiting Great Lakes' beach and dune communities vary in species richness and density according to plant community structure and composition. In general, avian species richness and density on lake dunes increase with plant community succession (Van Orman 1976). But low density and low richness or evenness (and hence diversity) do not imply or denote low conservation value and significance. What better example to illustrate this point than the occurrence on sand beaches of the federally endangered and threatened Piping Plover (Figure 12).

Absent from the Wisconsin shore of Lake Michigan as a nester since 1948 and from the Wisconsin shore of Lake Superior since 1983 (Figure

Figure 12. Foraging Piping Plover on Long Island, 1 June 1979. (Photo by S.W. Matteson)

13), the Piping Plover is one of three Wisconsin endangered breeding birds representing the lake beach community. Loss of nesting habitat and its effect on breeding Piping Plovers on Lake Michigan has been discussed. Along our Great Lakes' shores, it used to nest on extensive, undisturbed beaches in Kenosha, Door, and Oconto counties, as well as on Long Island and Chequamegon Point, and at sites in the Duluth-Superior Harbor. Its absence as a breeding bird along the Wisconsin shore of Lake Superior after the early 1980's is not related to breeding habitat loss here but probably to localized as well as extralimital factors (nest predation, storms, human disturbance—Figures 14a and b, residential and commercial development on/near the breeding and wintering grounds, gull invasions, chemical contaminants?) contributing to a regional population decline.

Piping Plovers generally require broad, barren, sand beaches, with scattered areas of gravel, bits of which typically line nest cups (SWM, pers. obs.; Haig *et al.* 1988). In 1987 and 1988, two beach areas at the southern end of Long Island and northern Chequamegon Point had mean widths of about 35m and 46m, respectively, well within the average widths (generally, 30–40m, though some beaches in Michigan's Upper Peninsula averaged 63m and 83m) of typical Piping Plover nesting beaches in the upper Midwest and Great Plains (Nordstrom 1990).

The Common Tern and Caspian Tern are the other two representative beach community species, although the Caspian Tern has been an irregular and rare nesting species (recently of dredge spoil islands), and the Common Tern has abandoned mainland sand beach habitats for sparsely vegetated islands, typically dredge spoil sites such as Interstate Island in the Duluth-Superior

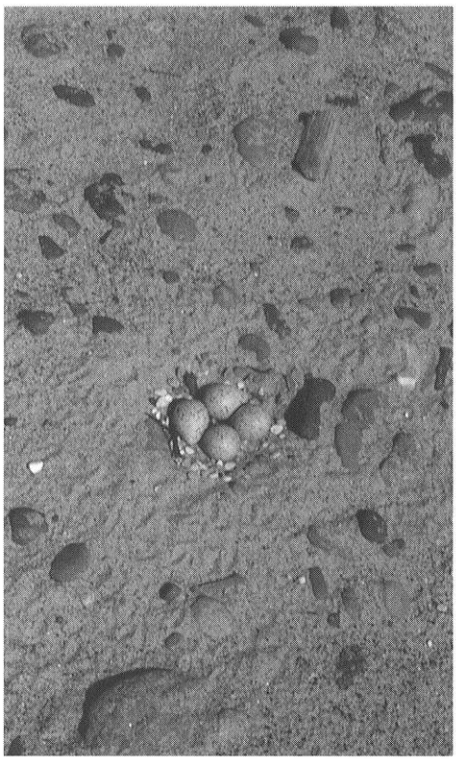

Figure 13. Clutch of 4 Piping Plover eggs, southeastern Long Island, 35 m west of lake edge, 2 June 1983. (Photo by S.W. Matteson)

Harbor (Figure 15). Both of these species are very sensitive to human disturbance, a factor contributing to their abandonment of mainland beach habitats (Matteson 1988, 1993).

If a breeding population of the Piping Plover becomes reestablished in the state, the most likely location is the Long Island/Chequamegon Point area. Based on my surveys of likely nesting habitat along Lakes Michigan and Superior, the beach and dune expanses here could probably support 10–15 breeding pairs. Nordstrom (1990) investigated the potential invertebrate resources available to Piping Plovers on Long Island/Chequamegon Point and other sites in the Great Lakes during 1987 and 1988 and found that Long Island/Chequamegon Point and another site contained invertebrate biomass 6–10 times greater than 17 other Great Lakes sites, with mean biomass greater in the wash zone than in the upper beach. Nordstrom documented the presence of invertebrates from 3 families at Long Island/Chequamegon Point: Chironomidae (midges) (62% of samples collected), Dolichopodidae (long-legged flies) (8%), and Tenebrionidae (darkling beetles) (8%).

Except for the Killdeer and Spotted Sandpiper (discussed below), and the very rare Piping Plover, summer inhabitants of the strand are not birds, but arthropods. Carabid beetles (Carabidae), tiger beetles (*Cicindela spp.*), lightning bugs (Lampyridae), crane flies (Tipulidae), cabbage butterflies (Pieridae), ground and field crickets (Gryllidae), Stone's grasshopper (Acrididae), burrowing spiders (Lycosidae), and sphecid wasps (Sphecidae) are some of the more common arthropods that inhabit sandy beaches and open dunes (Sanders 1969, Ballard 1991). It is the shorebird foraging at the water's edge, however, that readily comes to mind when we associate animal life with these areas.

Migrant Shorebirds—Thirty-seven (not including accidentals) of 49 nearctic shorebird species occur in Wisconsin (Table 3), ranging from common species such as Least Sandpiper to rare, casual species, such as the Red Phalarope. At least two of

a

b

Figure 14a. Author standing by fresh airplane tire tracks that came within 25 m of Piping Plover nesting site and 4 young on Chequamegon Point during 7 July 1979. (Photo by Kim Bro) Figure 14b. Ashland "short-order" cook riding ATV across Long Island/Chequamegon Point Sand Cut, 2 June 1983–the last year a clutch of Piping Plover eggs was documented in Wisconsin. (Photo by S.W. Matteson)

Figure 15. Fred Strand and natural resources technician Don Goodermote search for Common Tern chicks to band on Interstate Island, Duluth-Superior Harbor, 19 June 1991. Ring-billed Gull colony in background. (Photo by S.W. Matteson)

these, Short-billed Dowitcher and Sanderling, experienced significant population declines in North America during 1972–1983 (Howe *et al.* 1989). Prior to these declines, most shorebirds suffered serious losses from the nineteenth century into the early twentieth century when they were hunted for sport and food. Especially hard hit were Eskimo Curlew (now federally endangered), Lesser Golden Plover, and Hudsonian Godwit. In Louisiana in 1821, about 200 people harvested 48,000 Lesser Golden Plovers during a single day in the New Orleans area (Helmers 1992).

Habitat loss has certainly been a factor in the recent decline of other shorebirds such as the Snowy Plover (Figure 16) and Mountain Plover, and, of course, the Piping Plover (Haig *et al.* 1988, Helmers 1992). Organophosphate pesticides are a probable factor threatening shorebirds, especially on the wintering grounds in Central and South America where DDT, banned in the U.S. in 1972, is widely used (Helmers 1992).

Shorebirds that pass through Wisconsin most likely feed mainly on chironomid larvae (blood worms) and adults (midges) during migration largely because they are often the most abundant invertebrates present in the interior U.S. (Eldridge 1992) and along shorelines in the Great Lakes (Nordstrom 1990). Blood worms, incidentally, feed on periphyton (algae) that live on both living and dying plants in open, shallow-water habitats (Helmers 1992).

Shorebirds are renowned for re-

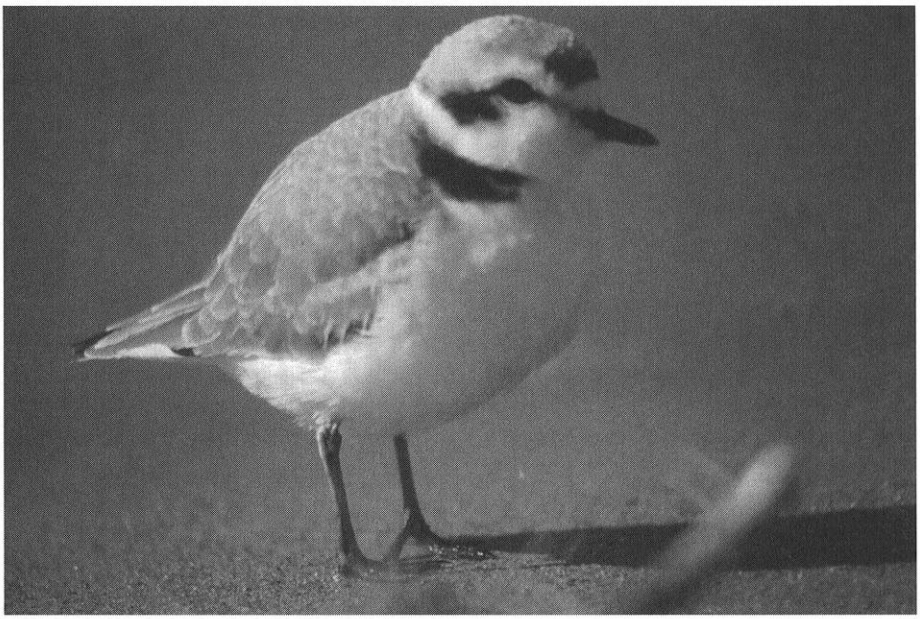

Figure 16. Snowy Plover, Two Rivers, Lake Michigan, 28 April 1991. Note the dark ear patch. (Photo by Charles Sontag)

sponding to spatial variations in prey densities and exploiting different foraging sites based on invertebrate abundance (Connors *et al.* 1981). Generally, most shorebird species (but not snipes and yellowlegs) forage at sites where short (less than one-half the height of the bird) vegetation comprises less than 25% of the ground cover, the remainder of the ground being open (Helmers 1992).

Shorebirds feeding on invertebrates along the strand or in shallow water can be classified as one or more of the following types: 1) *gleaner*—picks or gleans food from the substrate or water surface; 2) *sweeper*—sweeps for food in the water column; 3) *prober*—probes for food in the substrate. Sand beach and dune communities are uniquely supportive of shorebird foraging requirements because they provide relatively open coastal habitats rich in invertebrate life. Shorebird foraging guilds are presented in Table 3.

To take advantage of peak abundance levels in summer invertebrates, adult shorebirds of several species generally depart their breeding grounds before young have fledged; this leads to staggered migration flights. Unlike neotropical passerines, shorebirds depend on a few, highly productive stop-over sites where they "fatten up" on invertebrates before their long-distance migrations, which for several species amounts to 12,000km between breeding grounds and wintering sites (Helmers 1992). It becomes especially important, therefore, to pre-

Table 3. Foraging guilds of shorebirds occurring in Wisconsin 1

Species	Foraging Guild 2	Water depth (cm) 2	Status
Black-bellied Plover	terrestrial/aquatic gleaner3	dry-4	FCM
Lesser Golden Plover	terrestrial/aquatic gleaner	dry-4	FCMe, UMw
Semipalmated Plover	terrestrial/aquatic gleaner	dry-4	FCMe, UMw
Piping Plover	terrestrial/aquatic gleaner	dry-4	RM, RSRn
Killdeer	terrestrial/aquatic gleaner	dry-4	CM, CSR
American Avocet	aquatic gleaner/ sweeper4	8–21	UM, CaSR
Greater Yellowlegs	aquatic gleaner	1–12	FCM, RSR
Lesser Yellowlegs	aquatic gleaner	1–12	CM, RSR
Solitary Sandpiper	aquatic gleaner	1–12	FCM
Willet	aquatic gleaner	1–12	UM, CaSR
Spotted Sandpiper	terrestrial/aquatic gleaner/prober5	dry-1	CM, CSR
Upland Sandpiper	aquatic/terrestrial gleaner	0 (wet)-11	FCMe, UMwc, FCSRe, USRwc
Whimbrel	terrestrial/aquatic gleaner/prober	dry-16	USpMen, RFMe
Long-billed curlew	terrestrial/aquatic gleaner/prober	dry-16	CaSpM, CaSV
Hudsonian Godwit	aquatic prober	4–17	USpM, RFM
Marbled Godwit	aquatic prober	4–17	USpM, RFM
Ruddy Turnstone	terrestrial/aquatic gleaner/prober	dry-2	CSpMe, USpMwcn, UMne, RFMwc, RSRe
Red Knot	aquatic prober/gleaner	0 (wet)-11	UMne, RME
Sanderling	aquatic prober/gleaner	0 (wet)-4	FCM-LSM, UME
Semipalmated Sandpiper	aquatic prober/gleaner	0 (wet)-4	CM
Western Sandpiper	aquatic prober/gleaner	0 (wet)-4	UM
Least Sandpiper	aquatic prober/gleaner	0 (wet)-4	CM
White-rumped Sandpiper	aquatic prober/gleaner	0 (wet)-4	UM
Baird's Sandpiper	aquatic prober/gleaner	0 (wet)-4	USpM, FCFMe, UFME
Pectoral Sandpiper	aquatic prober/gleaner	0 (wet)-11	CM
Purple Sandpiper	terrestrial/aquatic gleaner/prober	dry-2	CaSpM, CalFeaWM
Dunlin	aquatic prober/gleaner	0 (wet)-11	CMe, FCMw, USVne
Stilt Sandpiper	aquatic prober/gleaner	0 (wet)-11	RSpM, UFM
Buff-breasted Sandpiper	aquatic prober/gleaner	0 (wet)-11	CaSpM, RFM
Ruff (exotic)	aquatic gleaner	1–12 cm ?	RSpM, CaFM, AS
Short-billed Dowitcher	aquatic prober/gleaner	0 (wet)-11	FCM, RSRe
Long-billed Dowitcher	aquatic prober/gleaner	0 (wet)-11	USpM, FCFM
Common Snipe	aquatic prober/gleaner	0 (wet)-11	CM, FCSRnc, RSRse, UWRs, RWRcnw
American Woodcock	aquatic/terrestrial prober/gleaner	0 (wet)-11	FCM, FCSRnc, USRs
Wilson's Phalarope	aquatic gleaner	6–22	FCSpM, UFM, USRwne
Red (Grey) Phalarope	aquatic gleaner	unknown: usually far offshore	UM

1 Species occurring as accidental (Robbins 1991), except Ruff, are excluded; status is from Robbins (1991).

2 adapted from Helmers (1992)

3 gleaner = picks or gleans food from the substrate or water surface

4 sweeper = sweeps for food in the water column

5 prober = probes for food in substrate

AS = Accidental in summer

(continued)

Table 3. *Continued*

CaFM = casual fall migrant
CalFeaWM = casual late fall and early winter migrant
CaSpM = casual spring migrant
CaSpMe = casual spring migrant east
CaSR = casual summer resident
CaSV = casual summer visitant
CM = common migrant
CMe = common migrant east
CSR = common summer resident
FCFM = fairly common fall migrant
FCFMe = fairly common fall migrant east
FCM = fairly common migrant
FCMe = fairly common migrant east
FCM-LSM = fairly common migrant on Lakes Superior and Michigan
FCMw = fairly common migrant west
FCSpM = fairly common spring migrant
FCSRe = fairly common summer resident east
FCSRnc = fairly common summer resident north and central
RFM = rare fall migrant
RFMe = rare fall migrant east
RFMwc = rare fall migrant west and central
RM = rare migrant
RME = rare migrant elsewhere
RSpM = rare spring migrant
RSR = rare summer resident
RSRe = rare summer resident east
RSRn = rare summer resident north
RSRse = rare summer resident south and east
RWRcnw = rare winter resident central, north, and west
UFM = uncommon fall migrant
UFME = uncommon fall migrant elsewhere
UM = uncommon migrant
UME = uncommon migrant elsewhere
UMne = uncommon migrant north and east
UMw = uncommon migrant west
UMwc = uncommon migrant west and central
USpM = uncommon spring migrant
USpMen = uncommon spring migrant east and north
USpMwcn = uncommon spring migrant west, central, and north
USRs = uncommon summer resident south
USRwc = uncommon summer resident west and central
USRwne = uncommon summer resident west, north, and east
USVne = uncommon summer visitant north and east
UWRs = uncommon winter resident south

serve important shorebird staging areas. On southwestern Lake Superior, Wisconsin Point-Minnesota Point and Long Island-Chequamegon Point are the most important shorebird staging areas. The Outer Island Sand Spit along with other Apostle Islands' sandscapes are also important shorebird stop-over sites (SWM, pers. obs).

In Green Bay, when water is low and chironomids are plentiful, Seagull Bar, Peshtigo Point, Little Tail Point, Long Tail Point, Point Au Sable, and Barkhausen Refuge are the most important stop-over sites; with high lake water, coastal impoundments, riverine marshes, and flooded farm fields become important. Ruddy Turnstone, Sanderling, and

Red Knot can be fairly common at several of these sites, with Dunlin, Least Sandpiper, and Semipalmated Sandpiper very common at Barkhausen Refuge (Tom Erdman, pers. comm.).

Along the shore of Lake Michigan from the Door peninsula south, important staging areas include the dredge spoil impoundments at Manitowoc, Kewaunee, and Milwaukee, particularly after fresh spoil has been recently deposited. Also important are: beach frontage at Bailey's Harbor; a shore area south of Point Beach State Forest and north of Two Rivers; a 3km stretch of beach between Two Rivers and Manitowoc; and shoreline at Sheboygan from North Point south to the city's marina. During spring in these areas, high numbers of Ruddy Turnstones and Whimbrels may be seen, especially during the third week of May. For example, it is not uncommon at this time to see 2–3,000 Ruddy Turnstones and 100–200 Whimbrels at the Manitowoc impoundment alone, although numbers may vary greatly from year to year, with up to 2,000 Whimbrels occurring on rare occasions. Red Knots are also fairly regular, but in far fewer numbers, typically less than 5 (Charles Sontag, pers. comm.).

Shorebirds are best observed with a spotting scope; anything less does not provide the same measure of enjoyment in appreciating the variety of rich plumages these remarkable shore denizens exhibit, to say nothing about the lost opportunity to identify species in a mixed flock. Away from the Great Lakes, shorebirds can be best observed during spring and fall at inland lake shores, and in mud flats and open agricultural habitats where ephemeral pools and ploughed fields provide rich invertebrate food sources. Black-bellied and Golden Plovers, for example, forage in wet ploughed fields for earthworms (Wishart *et al.* 1981).

Observations of Lake Michigan shorebirds in surveys used for this paper were scant compared to those noted on Lake Superior, apparently due to more extensive coverage along Lake Superior. For example, there were at least 16 consecutive years of observations during roughly the same time period at 2 Lake Superior sites compared with no more than 5 consecutive years of observations at 2 Lake Michigan sites (Table 4).

Fairly common shorebirds I encountered frequenting Lake Superior's beach community during late May/early June and early July 1978–1994, were: Least Sandpiper, Sanderling, Semipalmated Sandpiper, Semipalmated Plover, Killdeer, Lesser Yellowlegs, Spotted Sandpiper, Ruddy Turnstone, and Dunlin. Overall, however, on both lakes combined, except for Killdeer, Spotted Sandpiper, and to a lesser extent Sanderling, these species were uncommon to rare on breeding bird surveys in lake beach and dune habitats because they mostly occur just prior to and just after the Natural Areas Breeding Bird Survey period of 28 May–4 July (Table 2). These species are typically common and fairly abundant on both lakes earlier and later in the spring and summer, respectively.

Less common overall on Lake Superior except sometimes locally and

Table 4. Ten lake beach and dune sites surveyed along Lakes Michigan and Superior during 1970–1995.

Site	Years Surveyed	No. Surveys[1]	No. NABBS[2]	No. Species Observed[3]
KD	1980, 1988, 1991–1995	8	8	64
PB	1978, 1984, 1988, 1990–1993, 1995	19	17	103
WD	1976, 1987, 1988, 1990,1991	5	5	51
JHR	1993–1995	3	3	65
SB	1983, 1987–1991, 1993	8	8	54
LI	1974, 1978–1995	41*	9	109
MI	1985, 1990, 1992, 1994	4	4	50
SI	1988, 1994, 1995	3	2	30
OI	1974, 1976, 1977, 1979, 1982, 1984, 1989, 1991, 1994	22	5	123
WP	1970, 1971, 1976–1990, 1991, 1994	19	17	112
TOTAL:		132	78	208

1—Surveys include Natural Areas Breeding Bird Surveys and sometimes additional visits to search for and document breeding birds.

2—Systematic Natural Areas Breeding Bird Surveys following prescribed routes.

3—Includes several species noted during survey period that were late migrants.

*—Includes 17 daily visits in 1988.

*—Includes at least 6 daily visits each in 1976 and 1977.

Sites: KD = Kohler Dunes State Natural Area; PB = Point Beach State Forest; WD = Whitefish Dunes State Park; JHR = Jackson Harbor Ridges; SB = Seagull Bar; LI = Long Island; MI = Madeline Island Big Bay Sand Spit and Bog; SI = Stockton Island Tombolo; OI = Outer Island Sand Spit; WP = Wisconsin Point.

in late spring were: Black-bellied Plover, Lesser Golden-Plover, Greater Yellowlegs, and Short-billed Dowitcher. Occurring infrequently to rarely, usually in late May or early June, sometimes earlier in May, were: Piping Plover, Willet, Whimbrel, Hudsonian Godwit, Marbled Godwit, Red Knot, White-rumped Sandpiper, Baird's Sandpiper, Pectoral Sandpiper, Buff-breasted Sandpiper, Common Snipe—a common interior migrant, American Woodcock, and Wilson's Phalarope. Willet, Whimbrel, Hudsonian Godwit, and Marbled Godwit were observed foraging along the wash zone and in sandbar shoals and shallow waters. Except for nesting Killdeer, Spotted Sandpiper, and Piping Plover (up to the early 1980's only), all shorebirds encountered were late-spring or "early fall" (before mid-July) migrants, or possibly stragglers that remained in the area throughout the summer.

Very rare (sighted only once) on Lake Superior sand beaches, and not observed in Lake Michigan breeding bird surveys for this paper, were: Upland Sandpiper, an interior grassland and barrens species; Solitary Sandpiper, a fairly common interior migrant at flooded fields and small pond edges; and the Western Sandpiper, an uncommon migrant in Wis-

consin (Robbins 1991). Charles Sontag (pers. comm.) has seen this latter species regularly along with several of the "peeps" (Least Sandpiper, Semipalmated Sandpiper, Sanderling, Pectoral Sandpiper, Dunlin, Baird's Sandpiper, White-rumped Sandpiper) along Lake Michigan beaches, mainly during fall migration.

Bradstreet (1977) reported that at Long Point, Lake Erie, Semipalmated Plover, Piping Plover, Black-bellied Plover, Ruddy Turnstone, Spotted Sandpiper, both yellowlegs, Pectoral Sandpiper, Baird's Sandpiper, Least Sandpiper, Dunlin, and Sanderling preferred the wash zone to ephemeral beach pools for foraging in spring (1 April–30 June). Killdeers and dowitcher species preferred the latter. During July and August, however, most species above preferred beach pools due presumably to an abundant food supply; exceptions were Black-bellied Plover, Ruddy Turnstone, Spotted Sandpiper, and Sanderling, which foraged in the wash zone.

Migrant and Breeding Open-water Birds—Regarding waterbirds observed from the strand (and dunes) during summer, I observed Common Loons somewhat regularly though widely dispersed, along and out from Lake Superior's shores during the breeding season, but seldom along Lake Michigan. Sightings along both coasts generally occur more frequently during migration (Robbins 1991).

Very rarely seen during the summer as a late migrant or nonbreeding bird would be the arctic-breeding Red-throated Loon—I saw only one on Lake Superior during 1978–1995. Bernard (1967) described this bird as a rare transient and summer visitant in Douglas County, "noted mainly at Wisconsin Point, Superior." And Temple and Harris (1985) noted that this bird, absent during summer, is an "uncommon spring migrant and rare fall migrant" in the Apostle Islands. Extremely rare during any season would be another arctic breeder, the Pacific Loon. Robbins (1991) noted that Red-throated Loons are best observed during spring and fall "off the southern Ozaukee County bluffs" when 30–40 birds might sometimes be observed on any one spring day and 20–30 on a peak fall day.

Very rare, too, during the summer on Lakes Michigan and Superior would be an observation of a Horned Grebe or Western Grebe, with the latter the most likely to be observed. Even rarer during summer would be a sighting of an Eared Grebe or Red-necked Grebe, species that typically frequent interior lakes (Robbins 1991). Bernard (1967) noted that although Red-necked Grebes are generally rare spring migrants on Lake Superior, they may be occasionally common in spring. And Sam Robbins (pers. comm.) commented that during fall, Horned Grebes are regular migrants along the Lake Michigan coast, with dozens or more regularly seen between northern Milwaukee County and Manitowoc. Temple and Harris (1985) described the Horned Grebe and Red-necked Grebe as absent during summer in the Apostle Islands, but "fairly common" and "uncommon," respectively, as spring and fall migrants.

Beginning in the early 1980's, I began to see the American White Pelican during late spring in the Apostle Islands; not regularly, but intermittently during the decade, flying low over the Long Island Sand Cut area, or (once) loafing on Gull Island's cobble beach. A flock of 24 was observed on Long Island by Doug Beltman (*in litt.*) during the summer of 1988. Tangentially, in 1995 I accompanied Tom Erdman to a denuded corner of Cat Island in lower Green Bay to witness the first hatching of a White Pelican chick in Wisconsin during this century. A small colony of White Pelicans nested on the island during 1994 and 1995; no chicks hatched out in 1994; 1 fledged in 1995 (Tom Erdman, pers. comm.).

Although not treated extensively in this paper, it is worth noting that open cobble/gravel beaches, historically, have been important nesting sites on islands off the Door County peninsula for colonial waterbirds, such as Caspian Tern, Double-crested Cormorant, Herring Gull, Ring-billed Gull, and in pole-sized trees, Great Blue Heron (Jackson 1927); in recent years, Black-crowned Night-Herons have occupied shrubs and young trees on some Lake Michigan island shores. And Cattle Egrets and Snowy Egrets have occurred on Cat Island in lower Green Bay.

A bird somewhat commonly observed at local beach sites along Lakes Michigan and Superior is the Double-crested Cormorant. This bird numbered less than 100 in the entire state during the early 1970's, but its breeding population has grown exponentially and in 1994 numbered over 8,000 nesting pairs (Matteson *et al.*, unpubl. data). I have observed cormorants off-shore foraging for small-sized fish from most sandscapes in the Apostle Islands during summer, and often found them in early morning loafing at the tips of sandy island peninsulas. And I have observed this bird commonly in Green Bay and off the Door County peninsula.

Extremely rare at any time of year would be a Brant, an arctic inhabitant. Doug Beltman (*in litt.*) observed one intermittently during the spring and summer on Long Island in 1988.

Sometimes observed in bays or loafing on sandy beaches in family groups or foraging in young grassy dunes during summer is the Canada Goose. And somewhat commonly observed just off shore or loafing on shore at this time of the year is the ubiquitous Mallard, and on Lake Superior and northern Lake Michigan (Door County and northern Green Bay), the Common Merganser and Red-breasted Merganser. Sometimes encountered in sheltered bays and creeks contiguous to the strand or in ephemeral pools is the Blue-winged Teal. Occasionally observed off the Door County coast during summer is the Common Goldeneye (Sam Robbins, pers. comm.).

In 1985, I observed an immature White-winged Scoter loafing on Long Island during a mid-summer afternoon. A rare summer sighting such as this on Lake Superior at or near barrier beaches and sand spits is not unexpected because these sites provide important refugia for migrants and nonbreeding birds. White-winged, Surf, and Common

Scoters have been recorded as rare spring migrants on Wisconsin Point (Bernard 1967).

Migrant raptors and songbirds—A variety of waterfowl species may be more commonly observed from shore in far greater number during spring and fall migration. And it is during spring and fall migration that lake beach and dune communities often come alive with thousands of migrants, from passerines to raptors, particularly in the Apostle Islands, except that hawk numbers are generally far less here in the fall (Temple and Harris 1985).

There are few more rewarding experiences than to be motionless on an Outer Island dune during a September or early October morning, when, just after sunrise, waves of sparrows, kinglets, and warblers fly relatively low out over the dunes. On two separate occasions, while stationed in a heath-like dune at south Outer in late September, a Yellow-rumped Warbler and White-crowned Sparrow, respectively, alighted on my boot as I sat next to a weathered pine stump. Meanwhile, overhead, at different elevations passed large flocks of American Robins, Blue Jays, Rusty Blackbirds, Pine Siskins, Cedar Waxwings, and Northern Flickers. Spring passerine migration is equally rewarding here: Harris and Jaeger (1978) observed "spectacular flights with up to 1000 and even 3000 individuals passing in a half hour period."

Broad-winged Hawks and Sharp-shinned Hawks are the most abundant migrant raptors along our Great Lakes' coasts (Robbins 1991).

The Cedar Grove area, in Sheboygan County, and the Little Suamico area in lower Green Bay, are two of the most renowned locations on Lake Michigan for observing raptor migrations. Tessen (1976) provided this commentary on hawk movements above the sand ridge at Cedar Grove:

"By late August the hawks begin to move south, especially if the wind is north and westerly, since they prefer a tailwind. A few hawks, depending on the weather, may be seen almost any day from August through November, but usually the spectacular migrations appear on chilly days when the wind is strong from the northwest. It is best to arrive early, bring a lunch, choose a seat on the ridge . . . relax—if you can—and watch the show.

"Harriers may announce the start of the performance; then the Broad-wings, an occasional Bald Eagle, punctuated with accipiters and Ospreys, ride the skyway. By the first week in October, the large buteos—Red-tailed, Red-shouldered and Rough-legged—have joined the stream of migrants. The falcons--Peregrine, Merlin and Kestrel—are sandwiched in until mid-October. By November, when the Rough-legged are at their peak, or even in late October, the scarce Goshawk may be seen. A few individuals of the Swainson's Hawk have been trapped and banded. The Turkey Vulture and the rare Golden Eagle have been seen along the ridge. In fall, hawks may be seen in numbers from five to fifteen thousand on the best days [with some daily records of 5,000–8,000 Broad-winged Hawks in September]. *The spring migration is merely a trickle by comparison."*

One of the best locations in spring to observe migrating raptors along the southwestern Lake Superior shore is the Outer Island Sand Spit

(Figure 17). Harris (1977) studied spring hawk migration in the Apostle Islands and documented 6,523 individual raptors (mostly Broadwings and Sharpshins) representing 14 species, with most observations occurring from south Outer. *"Here,"* he commented, *"migrants could be seen arriving on the island from the direction of Stockton Island to the southwest. At times some hawks were reaching Outer while others were flying in exactly the opposite direction off the island* [reluctant to cross the open lake]. *These latter birds presumably had already traveled to Outer's north end and now were retracing their route. This phenomenon occurred most strikingly at mid-day on May 8, 1976, when winds came out of the west at 10 to 13 mph. Hawks in large numbers, including ten different species, were circling over South Pond and Outer's southern woodlands. Sharp-shinned Hawks sped along the beach with wings beating furiously, forced by the wind to pass as low as ten feet over the ground. Where the passage to Stockton was shortest, these lone birds would take out over the water, barely clearing the wave tops. The broad-winged hawks appeared hesitant to cross the water in such blustery weather. Frequently birds would hang over the beach edge then retreat over the forest, where I believe the trees broke the force of the wind. I counted 550 broadwingeds in flight at once, scattered everywhere over the island as far north as I could see."*

Commonly observed in September and into at least early October on south Outer Island is the Merlin (Figure 18), which Jackson (1941), Harris (1980), Mossman (1987), Tom Doolittle (pers. comm.), Eric

Figure 17. Outer Island Sand Spit, aerial photo of sand spit at southern end of island. (Photo courtesy of Apostle Islands National Lakeshore, U.S. National Park Service)

Figure 18. Merlin, foraging, south Outer Island, 24 September 1980. (Photo by S.W. Matteson)

Epstein (BER files), Bill Smith (pers. comm.), and I observed hunting low along beaches and dunes, and from which Merlins departed over open water to pursue passerines, a hunting strategy that met with mixed success (Jackson 1941; SWM, pers. obs.). Jackson (1941) reported the following Merlin observations during 7–16 September 1919 on south Outer:

> *"The hawks seemed to arrive on the island in pairs or more and were most plentiful on a long stretch of flat brushy land at the southwest end of the island frequented by numerous small birds such as sparrows, warblers, and flickers. As many as six hawks could be counted at one time and nearly always some bird was being chased by them. The flickers seemed to be harassed the most, at least as judged by the awful fuss they made. Their rapid notes of fright were continually heard from close-by to far-away, which made one way to estimate the number of hawks. . . . Savannah sparrows and other small birds were attracted to the beach by the accumulation of seeds and insects, and here was a particularly productive hunting ground for the hawks. The smaller birds seldom uttered a note when chased. At times one would fly out over the lake to catch an insect, and as if from nowhere a hawk would skim out after it with scarcely a wing-beat. The small bird would see the enemy just in time to fly circles around it, shoot straight up or straight down, or go through so many rapid angles and tacks that it was difficult to follow with the eye. Unless the hawk made a capture with the first swift strike it usually failed. The hawks were bold and often completely disregarded the presence of the fieldmen [sic]."*

From this September visit, Jackson reported that 15 Merlins were "collected," and their (14) stomach con-

tents analyzed. The analyses revealed the following items: Purple Martin (1), Red-breasted Nuthatch (2), Gray-cheeked Thrush (1), Swainson's Thrush (1), Hermit Thrush (1), Cedar Waxwing (1), Yellow-throated Vireo (1), Philadelphia Vireo (1), Black-throated Green Warbler (1), *Dendroica* sp. (3), Chipping Sparrow (1), Vesper Sparrow (1), Song Sparrow (2), Lincoln's Sparrow (4), Pine Siskin (1), House Sparrow (1), Odonata (dragonfly, 2), and *Vanessa* sp. (3)—a brush-footed butterfly—Nymphalidae, most likely the red admiral *Vanessa atalanta.*

Mossman (1987) observed Merlins at the lighthouse located near the island's north end, near the lagoon, and at beaver flowages and in pine barrens. Observing Merlin behavior at the lighthouse grounds, and also at the sand spit, he wrote:

> *"Two, and sometimes 3–4 immatures were present continually around the lighthouse grounds during the period 11–20 Sept*[ember], *and 1–2 were present thereafter. Here they made rather cruel sport of harrassing flickers, and they occasionally captured yellow-rumped and palm warblers. Like the warblers and flickers, they were fairly unaffected by our presence, and they often passed within 3m of us during their pursuits. One chased a yellow-rumped warbler that was perched beside me on the picnic table, and actually brushed my back with its primaries in passing. I saw one capture a palm warbler on the lighthouse grounds on 14 Sep*[tember], *an unidentified (palm or yellow-rumped) warbler that had wandered 20m off the north shore on the same date, and a yellow-rump that was feeding on the beach among driftwood on the sand spit on 23 Sep*[tember]. . . . *I saw merlins chase birds as large as raven, bald eagle, peregrine, and each other, evidently for 'sport', 'practice', or the heck of it."*

Epstein (*in litt.*) once observed a Merlin flying toward south Outer from the direction of Michigan Island on September 14, 1990. He commented in his field notes: *"Merlin approached . . . ca 1300* [hrs], *very low, wing tips almost touching water. Seen first 1/4 to 1/2 mile from spit. Shorebirds on beach west of bog included 2 Semipalmated Sandpipers, Baird's Sandpiper, several small flocks of Sanderlings, Black-bellied Plover. Merlin chased Sanderlings, didn't catch anything but pursuit was fantastic: with 180 degree turns, incredible bursts of speed, twists and turns. Sanderling being pursued stayed very close (within 3 feet)* [to] *lake surface. The Merlin suddenly 'braked', rose to a height of 10 feet, peeled off,* [and] *attacked a second flock of Sanderlings several hundred feet down beach."*

By comparison here, the occasional southbound Peregrine Falcon I observed did not exhibit characteristic chase behavior and cruised low over the dunes, nevertheless spooking loafing gulls and causing passerines to drop suddenly into sparse grasses. This was not the case in mid–September 1993 when Eric Epstein (pers. comm.) watched a Peregrine attack and kill a Merlin! Van Stappen and Doolittle (1995) commented on the regional and national importance of the Outer Island Sand Spit to staging falcons.

Breeding Season Observations—Results and Discussion

Observations by habitat type are presented below.

Strand—In general, the most commonly observed species in the strand zone during the breeding season are colonial waterbirds: Herring Gull, Ring-billed Gull, irregularly the Bonaparte's Gull, the locally regular Caspian Tern, the uncommon and local Common Tern and Forster's Tern (The latter occurs very rarely along Lake Superior and was not listed on surveys used for this paper.), and the occasional to fairly common loafing Double-crested Cormorant.

Birds frequenting the strand zone are typically scavengers, prominently gulls, feeding on dead fish such as carp or lake trout. But there are also Killdeer, Spotted Sandpiper, American Crow, Red-winged Blackbird, Common Grackle, and sometimes American Robin, attracted to the water's edge to feed on invertebrates and other food items.

In a study of birds inhabiting southern Lake Michigan beaches and dunes, Van Orman (1976) found that the Common Grackle "was the most common beach exploiter," feeding on dead alewives (*Alosa pseudoharengus*). American Robins, Empidonax flycatchers, and female Red-winged Blackbirds also were observed foraging along beaches. Other birds he observed were: Great Blue Heron (once), Snowy Egret (once), Mallard, Spotted Sandpiper, American Crow, Gray Catbird (once), European Starling, Northern Cardinal, and Song Sparrow.

Early avian succession is similar in lake beach and dune communities on both lakes due to similarities in grass and forb successional stages. On both Lakes Michigan and Superior I occasionally found Killdeer nesting in the upper reaches of the strand with no vegetative cover, and Spotted Sandpiper amid grasses of 10–30% cover. Killdeer are habitat generalists that occupy relatively flat open ground free of woody vegetation. Often they will nest on cleared grass, gravelly, or bare ground areas near parking lots or buildings in the most public of places. Beals (1958) documented 2 Killdeer nests with eggs on "sparsely vegetated" sand dunes along the east side of Stockton Island. Spotted Sandpipers commonly place their nests at the base of plants in semi-open habitats (Oring *et al.* 1983).

On 6 July 1919, Jackson (1942) found a Tree Swallow nest "composed of weed straws and gull feathers" in a driftwood log (Figure 19) on the south Outer Island beach. *"Examination disclosed a hollow log about 8 inches in diameter imbedded in the sand. At one end was a hollow used by the swallows as an entrance as was indicated by tracks in the sand where the birds touched before entering the log. . . . The nest was 34 inches from the entrance and when an opening was made in the log there, it disclosed five feathered young, three of which flew out one by one."*

Historically, as mentioned earlier, Common Terns (Figure 20) nested on sand beaches and sandy peninsulas in Wisconsin, but over the last 25–50 years they have shifted largely to dredge spoil islands and other artificial islands (Matteson 1988). I also found small colonies of Herring and Ring-billed Gulls on upper mainland sand beach habitats, but these invariably failed due to mammalian predation by raccoon, red

Figure 19. Tree Swallow nest in beached hollow log, Outer Island, 6 July 1919. (Photo by Harry H. Sheldon)

fox, and mink. On dredge spoil islands, however, where sand habitats resembled mainland beach and dune habitats, large colonies of Ring-billed Gulls occupied entire islands.

Foredune—Moving inland from the strand, on active dunes (foredune) partially stabilized by *Ammophila* on Lake Superior and dune reed on Lake Michigan, with little or no woody vegetation present, I commonly found Spotted Sandpiper and occasionally Savannah Sparrow, present or nesting in short, grassy cover 60–80%, and occasionally Horned Lark. Savannah Sparrow breeds in a wide array of grass habitats where grasses and forbs are of relatively short to moderate height. On Lake Superior, I also found Spotted Sandpiper nesting in short, mixed grass-heath 60–90%.

Bobolink, another grassland species and a WDNR species of special concern, was absent from Lake Superior dune habitats but fairly common locally in grassy Lake Michigan dunes. Common Grackle was fairly common but in low numbers in grassy foredunes on both lakes. Eastern Meadowlark, a grassland habitat generalist that prefers mesic sites over dry habitats (Sample and Hoffman 1989), was rare to absent in grassy foredunes on both lakes. The same foraging hirundinids were present—Purple Martin (rare), and the swallows: Tree, Northern Rough-winged (uncommon), Bank Cliff, and Barn Swallow.

Van Orman (1976) found that sparrows (Field, Song, and Vesper) were the dominant inhabitants of the beach grass-cottonwood community at dunes on southern Lake Michigan, comprising 45% of the total number of individuals detected. He found that Field Sparrow and Red-winged Blackbird had the highest breeding density in beach grass-cottonwood followed by Song Sparrow, Vesper Sparrow, Mallard, Brown Thrasher, European Starling, Brown-headed Cowbird, Eastern Kingbird, and Killdeer.

Van Orman (1976) and McCracken *et al.* (1981) noted that in open sand dune communities breeding bird species richness was low with generally low densities; though densities varied depending on vegetation type, amount of water present, and adjacent community type.

Backdune heath, grassland/savanna, and sand ridge—In Wisconsin heath-

Figure 20. Adult Common Tern settling on 2 eggs at Ashland Pier colony site, Chequamegon Bay, Lake Superior, 8 June 1988. (Photo by S.W. Matteson)

like backdune and backdune grassland/savanna, as shrubs and saplings/trees became more pronounced, dune inhabitants included: American Redstart (uncommon to rare in conifers, Lake Superior only), Black-capped Chickadee (fairly common in scrubby backdune grassland/savanna), Mourning Dove (sometimes found in dune copse, more regularly along forested edges of old dunes), and Eastern Bluebird (rare to uncommon in backdune grassland/dune heath on Lake Superior; uncommon to locally common in mixed grass/dune heath on Lake Michigan). Jackson (1942) found bluebirds nesting in dead pine stubs on Outer Island in 1919.

Also occurring in backdune grassland and heath-like backdune: Red-eyed Vireo (in dune copse—Long Island), Yellow Warbler and Common Yellowthroat (both commonly associated with dune copse and shrubby thickets, and open dune swale and wetlands), Indigo Bunting (fairly common in backdune grassland/savanna and forested dune edge and opening, Lake Michigan; absent from Lake Superior dune and forested dune ridge surveys), Dickcissel (extremely rare, Lake Superior; absent from Lake Michigan surveys), Chipping Sparrow (abundant in forest edge; fairly common in dune copse), Clay-colored Sparrow (fairly common locally in backdune grassland/savanna where shrubs were >40% cover, otherwise uncommon to absent; fairly common locally in heath-like backdune), Field Sparrow (uncommon in backdune grassland, Lake Michigan only; absent from Lake Superior surveys),

Vesper Sparrow (common at Kohler Dunes State Natural Area but uncommon to rare in backdune grassland on Lake Michigan; absent on Lake Superior dunes), Song Sparrow (abundant in shrubby thickets, and fairly common in backdune grassland/savanna and heath-like backdune), and Brewer's Blackbird (uncommon in heath-like backdune, except at Wisconsin Point, Lake Superior).

American Woodcock was observed rarely—only from Lake Superior—in heath-like backdune adjacent to pine savanna.

Extremely rare was the Western Kingbird. I observed one perched on a common juniper in a backdune on Outer Island in late spring. Eastern Kingbird was locally common in dune copse and forested dune edge; occasionally foraging over beaches and dunes.

Other species included: American Crow (fairly common, backdune grassland/savanna), Horned Lark (uncommon to rare in backdune grassland), Gray Catbird (locally common: shrubby backdune grassland/savanna; observed by McCracken *et al.* (1981) in a variety of mid-successional dune habitats on Long Point), European Starling (fairly common in backdune grassland/savanna along Lake Michigan, locally common along Lake Superior), Red-winged Blackbird (fairly common, typically found in marshes adjacent to a strand, occasionally in shrubby thickets, and sometimes in backdune grassland), Western Meadowlark (extremely rare; a narrow sand ridge protruding into a boggy lagoon at the Stockton Island tombolo was the site of the only occurrence on all lake dune and beach surveys—E. Epstein, pers. comm.; this species typically occurs in dry upland short-grass sites), Common Grackle (fairly common, backdune grassland/savanna), Brown-headed Cowbird (fairly common: dune copse, forested dune ridge and swale, and tombolo/sand ridge), Baltimore Oriole (fairly common, dune oak copse), and American Goldfinch (common: backdune grassland/savanna, shrubby thickets, creek edge; occasionally observed flying over grassy dunes near the forest edge).

During late spring and summer, I have observed the following species foraging for insects in and over dunes: Chimney Swift, Northern Flicker, Eastern Phoebe, Eastern Kingbird, Horned Lark, the hirundinids, and Eastern Bluebird.

Open dune swale and other wet habitats—At open sedge-rush habitats in shallow pools adjacent to the strand, I encountered, rarely, lone Wilson's Phalaropes foraging for invertebrates. This species typically nests in wet meadows in grasses 10–30cm tall, often adjacent to a permanent or semi-permanent wetland (Eldridge 1992). In Wisconsin, it is all but restricted to sedge meadows in occurrence (Mossman and Sample 1990).

To observe other phalarope species, such as Red-necked Phalarope, most likely you would have to venture far off shore, a sighting one might describe as fortuitous. Extremely rare would be an observation of the Red Phalarope, a pelagic species that H.L. Stoddard (1947) was so intent on collecting for the Milwaukee Public Museum in the 1920's that he once swam a quarter-mile out

into Lake Michigan with his gun floating on a log to see if a Red Phalarope was mixed in among Red-necked Phalaropes. It wasn't.

Immature and subadult Bald Eagles were regular visitors to the southern Long Island shore during late spring and early summer, perhaps attracted to the concentrations of Eurasian carp that inhabited the shallow western bay waters and occasionally the seasonal pools created by storm surge.

Where lake beaches and dunes were adjacent or contiguous to streams, creeks, and lagoons, Belted Kingfishers were present. In shallow sedge marshes adjacent to sand spits, baymouth bars, or dune ridges, there occurred somewhat commonly (in low numbers) Common Yellowthroat—characteristic of sedge meadow, wet prairie, alder thicket/shrub carr, fen and open bog, northern hardwood swamp, and pine/oak barrens; Swamp Sparrow—characteristic of the same habitat types as Common Yellowthroat, with the exception of pine/oak barrens, also found in boreal forest edges; Red-winged Blackbird; occasionally Sedge Wren—characteristic of sedge meadow and open bog; and rarely Marsh Wren and Yellow-headed Blackbird.

An occasional Great Blue Heron, Spotted Sandpiper, Semipalmated Plover, and rarely a Green Heron, foraged in interdunal wetlands on Lake Superior. Interdunal wetlands in general attract and may support a few pairs of Song Sparrow, Red-winged Blackbird, and Common Yellowthroat, although I did not find evidence of nesting at 5 sites I visited on Lakes Michigan and Superior.

Also present in shrubby thickets adjacent to interdunal pools were Gray Catbirds and Common Grackles, species fairly widespread in a variety of community types, where shrubs and saplings predominate.

Forested dune ridge—Discussion of birds inhabiting wooded dune ridge habitats overlaps with information presented in previous articles from this series, specifically articles on birds inhabiting northern mesic forests (Hoffman 1989a), boreal forests (Mossman *et al.* 1990), northern swamps and bogs (Hoffman and Mossman 1993), as well as pine and oak barrens (Mossman and Epstein 1991). Table 2 summarizes and compares the abundance of birds documented for this paper. The more common species detected along dune ridge edges in shrubs/saplings and in woods within 100–150m of the open dune/forest edge were:

1) Northern Flicker, a bird observed in early successional forest types (Beals 1960; this paper); 2) Eastern Kingbird, a species that occurred commonly in shrubby dune swale habitats (McCracken *et al.* 1981; this paper), also characteristic of pine and oak barrens (Mossman and Epstein 1991), early successional northern mesic forest (Hoffman 1989a, this paper), shrub carr and shrubby/sapling sedge meadows (Mossman and Sample 1990), and found in brushy dry and dry-mesic prairies (Sample and Hoffman 1989) and farmland/woody edges; 3) Tree Swallow, a habitat generalist, observed foraging along forested dune ridge edges and over open beaches and dunes; on Lake Erie, typically associated with mid-to-late dune suc-

cession and mature dune woodlands (McCracken *et al.* 1981); 4) Blue Jay, a species associated (this paper) with mature beech and oak forests, and which nests in mature oak-maple dunes (Van Orman 1976, McCracken *et al.* 1981) and is common in a variety of dry to dry-mesic forests (Mossman and Epstein 1991); 5) American Crow, another habitat generalist, occurred commonly along mixed wooded dune ridge edges; 6) Black-capped Chickadee, observed commonly in a variety of wooded dunes and on sand ridges, often in shrubby openings and along forest edges; a species found in a wide variety of northern and southern forest types; 7) American Robin, a species found in northern Wisconsin pine forest edges and openings (Hoffman and Mossman 1990), shrubby sedge meadows (Mossman and Sample 1990), brushy dry and dry-mesic prairies (Sample and Hoffman 1989), alder thickets and shrub-carr (Hoffman 1989b), coniferous northern Wisconsin swamps and bogs (Hoffman and Mossman 1993), and generally observed in a variety of open, shrubby woods, and forested edges, dominated by shrubs and saplings (Mossman and Epstein 1991), including wooded dune ridge edge and sand ridge edge (this paper).

8) Cedar Waxwing, typically found in pole-sized deciduous northern mesic forests (Hoffman 1989a), shrub-carr (Hoffman 1989b), bog forests of tamarack and black spruce (Hoffman and Mossman 1993), and observed (this paper) in mixed conifer-hardwood dune ridge edge and openings, and in Long Island tamarack-white pine bogs. 9) Red-eyed Vireo, noted in oak-maple-hemlock forested dunes (Van Orman 1976, McCracken *et al.* 1981, this paper), jack pine ridge (this paper), and forested dune swales (McCracken *et al.* 1981, this paper), baymouth bars with pines-hardwoods (Hoffman and Mossman 1993, this paper), also in early successional to mature northern mesic forests (Hoffman 1989a), hardwood bogs and swamps, tamarack and black spruce bogs (Hoffman and Mossman 1993, this paper), white birch forests in the Apostle Islands and on Isle Royale (Beals 1960), and early successional birch/aspen boreal forest as well as fir-dominated boreal forest (Mossman *et al.* 1990).

10) Yellow-rumped Warbler, characteristic cedar swamp bird and found in tamarack and black spruce bogs (Hoffman and Mossman 1993, this paper), conifer-loving in boreal and northern mesic forests (Hoffman 1989a, Mossman *et al.* 1990), and observed (this paper) in dune cedar swales, jack pine swales, and generally along mixed coniferous-hardwood dune ridge edge; 11) Black-throated Green Warbler, one of the most common forest species in mature conifer-dominated (except pines) and mixed hardwood northern mesic woods, northern swamps and bogs, and boreal forests (Beals 1960, Hoffman 1989a, Mossman *et al.* 1990, and Hoffman and Mossman 1993) and detected in these forest communities along dune ridges and swales and in associated bogs and swamps (this paper); 12) Blackburnian Warbler, observed (in low number) in conifer-dominated, mixed conifer-hardwoods on dune ridges and swales (this paper), typically found in mature northern

mesic forests (Hoffman 1989a), in mixed conifer-hardwoods in the Apostle Islands where conifers are predominant (Beals 1960), in fir-dominated boreal forests (Mossman *et al.* 1990), and in northern cedar swamps and northern swamps and bogs with hemlock or mature coniferous-hardwoods present (Hoffman and Mossman 1993).

13) Chestnut-sided Warbler, observed (this paper) in dune ridge openings and along edges in young hardwood stands, and sometimes in jack pine swale, but commonly found in deciduous saplings in northern mesic forests (Hoffman 1989a), especially in stands with abundant white birch present (Beals 1960), and on sandy soils with an early successional stage of forest regeneration (Mossman and Epstein 1991); 14) Nashville Warbler, detected (this paper) in mixed coniferous-hardwood lake dune ridge edges and in jack pine ridge and swale, found generally in pole-sized coniferous and mixed coniferous-hardwood northern mesic forests (Hoffman 1989a), prominent in pine stands—especially red pine—in the Apostle Islands (Beals 1960), characteristic of forested bogs—preferring tamarack, spruce, and fir, and co-dominant in cedar swamps (with Winter Wren, Black-throated Green Warbler, and Ovenbird) (Hoffman and Mossman 1993, this paper—Long Island bog), observed often in aspen-birch boreal forest edges (Mossman *et al.* 1990), detected in pine and oak barrens' woods (Mossman and Epstein 1991), and in northern and central sedge meadows succeeding to open bogs with conifers (Mossman and Sample 1990).

15) American Redstart, a species common in mid-successional upland forests in southern Wisconsin (Bond 1957), observed (this paper) in quaking aspen, paper birch, Hill's oak, and young white pine, as well as balsam fir and jack pine, on forested dune ridge edges and in Hill's oak and jack pine swale, also in tamarack bog on Long Island, and in speckled alder along the shores of Allouez Bay (Robbye Johnson, pers. comm.); observed commonly by Van Orman (1976) in rugged dune ridges and swales dominated by American beech, sugar maple, and eastern hemlock, with a mostly maple understory; found in sapling and pole-sized deciduous woods (Hoffman 1989a); prominent in pine and birch-maple stands in the Apostle Islands (Beals 1960); noted in pines-hardwoods at baymouth bars and in shrubby northern hardwood swamps (Hoffman and Mossman 1993); detected in fir-dominated boreal forest and birch/aspen boreal forest (Mossman *et al.* 1990), and in dense shrubs/saplings of pine and oak barrens (Mossman and Epstein 1991).

16) Chipping Sparrow, common in mid-successional dune woods in openings and edges on Long Point (McCracken *et al.* 1981), in jack pine stands on southern Lake Michigan (Van Orman 1976), along dune ridge edges in oaks and pines—both Lakes Michigan and Superior (this paper), in coniferous northern swamps and bogs (Hoffman and Mossman 1993, this paper), in open barrens with low—less than 1m—woody vegetation (Mossman and Epstein 1991), and in coniferous saplings of northern mesic forests

(Hoffman 1989a); and 17) Common Grackle, typically an edge species, observed in shrubby forested dune ridge edges and dune copse (this paper), common in shrubby damp areas and edges of boreal forest (Mossman *et al.* 1990), in both alder thickets and shrub-carr (Hoffman 1989b), in shrubby sedge meadows (Mossman and Sample 1990), in fen and shrub habitats behind Lake Superior baymouth bars, and in tamarack-white cedar sloughs, oak savannas, and red oak-sugar maple forests on Long Point, Lake Erie, (McCracken *et al.* 1981).

In recent years, several pairs of breeding Merlins have been identified along the Lake Superior shore, including the Apostle Islands (Doolittle and Balding 1995). Other raptors present (irregularly) during summer in lake beach and dune communities include the Turkey Vulture, Bald Eagle, Northern Harrier—observed foraging in and over dunes on Long Island, Broad-winged Hawk (rare), Cooper's Hawk (rare), Sharp-shinned Hawk (rare)—the latter three species in forested dune ridges, and American Kestrel (rare).

Overall, what emerges from surveys conducted in lake beach and dune grass, forb, and woody habitats between 1970 and 1995 is a rich assemblage of bird species representative of several community types. The opportunities for birders abound since a variety of edge species, and species attracted to open habitats and forest openings, respond to dynamic coastal, topographic, edaphic, and disturbance factors along the Great Lakes, and use lake beach and dune communities for foraging and resting, and occasionally, nesting.

Description of Sites

The following 6 sites of 27 listed below are representative of quality sand beach and dune communities along the Wisconsin Great Lakes. Two of the sites—Long Island and Outer Island in the Apostle Islands—are owned and managed by the National Park Service and not easily accessible, except by boat. This lack of accessibility is a principal reason why these sites have remained relatively pristine and undisturbed by humans, except for some logging in the nineteenth century and perhaps occasional fires. Wisconsin Point is accessible by car and unlike the previous sites has received considerable human traffic.

The other three sites, located on Lake Michigan: Kohler Dunes State Natural Area, Point Beach State Forest, and Whitefish Dunes State Park (Figure 21), have received considerable human use, but they have been successfully managed and retain to varying degrees outstanding features of lake beach and lake dune communities.

Other lake beach and dune sites (some featuring dune ridge-swale topography) on Lake Michigan include:

1) Kenosha Sand Dunes in Kenosha County (T2N R23E S7SE,8), with about 1km of well-developed dunes featuring dune succession of foredune-swale-wet prairie; but the shoreline here is entirely rip-rapped, with no beach present; 2) Fox Point Clay Bluffs and Beach in Milwaukee County (T8N R22E S9,16), featuring

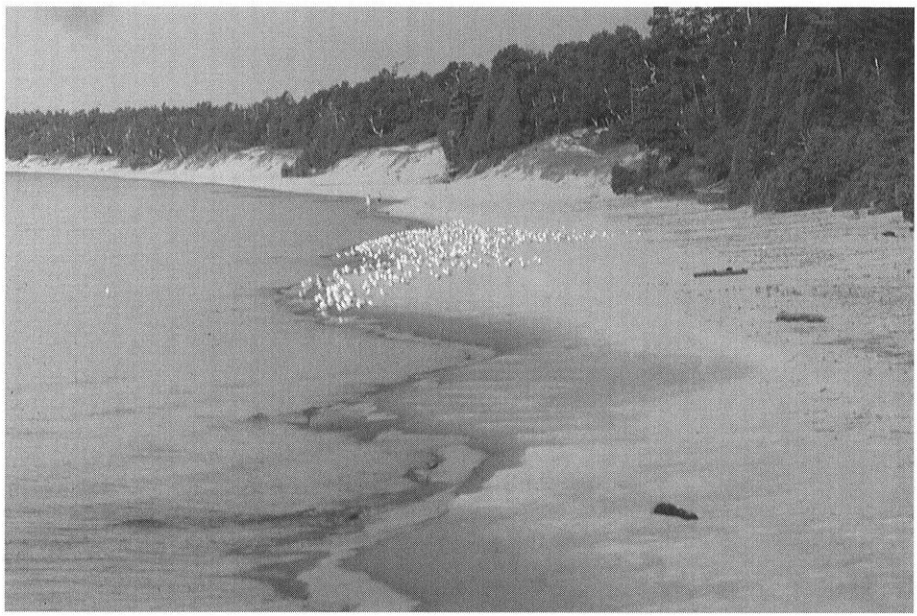

Figure 21. Strand, dunes, and gulls at Whitefish Dunes State Park. (Photo courtesy of Wisconsin Department of Natural Resources)

beach and offshore bars naturally nourished by sediments; 3) Cedar Grove Ornithological Station in Sheboygan County (T13N R23E S30), occurring on about 12ha of low, abandoned dunes.

In Door County: 4) Clay Banks Beach (T26N R26E S3NW), about 25ha of beach-ridge-swale topography; 5) Sturgeon Bay Canal Beach and Ridges (T27N R26E S22SESE,23) featuring a small tract of low, undeveloped dunes and old beach ridges; 6) Newport Conifer-Hardwoods (T32N R29E S28,29,33) featuring a variety of forest types with hardwoods stabilizing a portion of low dunes, and sand beach covering about 1km; 7) Hotz Tract (T32N R29E S4,9), with almost 2km of undeveloped low dunes; 8) Detroit Island Beach (T33N R29E S13,24), featuring about 12ha of sand beach, interdunal swale, and backdunes; 9) Jackson Harbor (formerly Furrer Beach and Dunes) (T34N R30E S27,28), about 20ha of beach, dunes, and beach pools known to harbor unique and localized Great Lakes plants; and 10) Jackson Harbor Ridges (T34N R30E S28SE), an important refugia for several Great Lakes coastal plant species and featuring about 13ha of low dunes, sand flats, shallow ponds, marshy areas, and stabilized sand ridges with a mixed conifer-hardwood forest—all 4 latter sites occurring on Door County's Washington Island.

On Green Bay: 11) When water levels are low: the peninsular Little Tail Point (T25N R21E S5,6,8) and 12) Long Tail Point (T25N R21E

S19,30,31,32,5) (both lake beach community only) in Brown County; 13) Ansul Patterned Dunes in Marinette County (T30N R23E S13NE; T30N R24E S18WNW), about 73ha of stabilized dune ridge with a Hill's oak-jack pine forest, and interdunal swales featuring ephemeral ponds and sloughs; and 13) Seagull Bar (Figure 22) Natural Area in Marinette County (T30N R24E S9,16), with about 2ha of lake beach and about 10ha of lake dune.

There are additional lake sites of varying size and quality, and sites that do not "fit" properly in a discussion of lake beaches and dunes, such as the botanically rich Ridges Sanctuary in Door County, which features parallel abandoned beach ridges and swales overlying a dolomite bedrock. At several locations along Lake Michigan, beach/dune succession, when left undisturbed, has led to the establishment of mature second-growth forest cover.

On Lake Superior, additional quality sites include:

In the Apostle Islands in Ashland County: 14) Stockton Island Tombolo (T51N 52N R2W S1,36), with a large sedge bog and lagoon, about 11ha of barrier beach, about 2ha of lake dunes dominated by beach grass, and interdunal pools that serve as critical microhabitats for rare Great Lakes flora, such as small purple bladderwort and the shore sedge *Carex lenticularis;* 15) Rocky Island Cuspate Foreland (T53N R03W S36NE), featuring 3ha of open dunes dominated by reindeer lichens (*Cladina* spp.), beach grass, and other dune associates on the island's southeastern end; 16) Big Bay Sand Spit, Ridges and Bog Natural

Figure 22. Seagull Bar (western end), Lake Michigan. (Photo by S.W. Matteson)

Area on Madeline Island (T50N R3W S13,14,23), featuring a 200ha bog-lagoon complex and a 2.3km-long, pine-dominated backdune area adjacent to grassy foredunes and barrier beach; 17) Amnicon Bay Bog Lagoon and Beach on northeastern Madeline Island (T51N R2W S35NW), featuring a 1km-long barrier beach adjacent to an extensive bog lagoon and bog wetland; 18) Steamboat Point on northwestern Madeline Island (T51N R2W S21SE), featuring about a 1km-long cuspate foreland with several grass dune species and an adjacent white pine-red oak beach ridge and grass-alder swale; 19) Western Michigan Island Beach and Dunes (T51N R01W S20SW), with a small barrier beach and up to 50m-wide dunes dominated by beach grass, beach wormwood, beach pea, common juniper, and sand cherry (Judziewicz and Koch 1993); 20) Bark Bay Slough Natural Area in Bayfield County (T51N R7W S34,35,36; T50N R7W S1,2,3; T50N R6W S6NW), featuring a baymouth bar beach nearly 1km long with ericads, speckled alder, and beach grasses and parallel beach ridges with mature white pines adjacent to a large sedge bog, fen, and lagoon; and 21) Port Wing Boreal Forest and Bog Natural Area in Bayfield County (T50N R8W S21,28), with about 1km of sand beach adjacent to a boreal forest of mixed pines and hardwoods on an old beach ridge.

Kohler Dunes State Natural Area—Size. About 54ha: lake dune (48.5ha), interdunal wetland (4.8ha), lake beach (0.8ha), northern dry-mesic forest (0.4ha).

Location. Eastern Sheboygan County, Lake Michigan (T14N R23E S22,23), within Kohler-Andrae State Park, about 3km south of Sheboygan and about 69km north of Milwaukee.

Access. From Sheboygan go south 4.8km (3 miles) on Hwy 43 to Hwy V; drive east on V for 1.6km (1 mile) to Hwy KK; proceed south on KK for 1.6km and turn east from KK onto Old Park Road, then drive to the entrance of Kohler-Andrae State Park.

Site Description. This state natural area has two sections: 1) A 14.1ha parcel lies northwest of the Sanderling Nature Center, located 61m from Lake Michigan, and features 0.4km of open beach with sea rocket, seaside spurge, beach pea, winged pigweed, and silverweed present, active and stabilized dunes with remnants of dry-mesic white pine forest, some Norway spruce, and 5 small (<0.4ha) interdunal wetlands. The dune field here, about 152m wide and about 884m long, is largely stabilized by beach grass, sand reed, little bluestem, and junipers, except in sand blow-outs in the north end.

Scattered along 0.4km of foredune adjacent to the beach and in dune swale grows dune thistle, mostly on the foredune's back side.

2) The 40.4ha section south of the nature center features rolling active and stabilized dunes punctuated by sand blowouts. A fairly large 1.6ha interdunal wetland and two scattered smaller ones occur along the natural area's western boundary. A 0.8km nature trail called the "Creeping Juniper Nature Trail" starts at the nature center and loops back to the nature center's parking lot.

The natural area's nature trail is part of an innovative "cordwalk"—a

boardwalk tied together by rope—to prevent trampling of dune vegetation and provide a unique opportunity to become acquainted with the flora and fauna of sand dunes. The 3.1km cordwalk crosses the entire length of the natural area (both sections) beginning at the group camp area and parking lot on the south end and continuing northeast from the nature center to a parking lot at the northeast end of the natural area.

In the 1930's, a large pine plantation of Scotch (*Pinus sylvestris*), jack, and red pine was planted in what is now the natural area, but most of it has been removed because it was shading out dune plants. In fact, all of the red pine once located in the parcel north of the nature trail has been removed. A mix of red pine, jack pine, and white pine occur along the natural area's southwestern border adjacent to interdunal wetlands and in an area bordering the south end parking lot. Scotch pine is prominent in portions of the southern section and immediately northwest of the nature center.

Northern hardwoods (red oak, red maple, yellow birch *Betula alleghaniensis,* and beech) also occur intermixed in the southern and northern ends bordering the dunes. West of the nature center on the nature trail loop are pockets of Scotch pine and one small stand of Norway spruce (*Picea abies*). Lowland brush and marshy areas associated with the Black River lie west of the state natural area and parallel to the dune fields.

Stabilizing the backdunes in both state natural area sections are: sand reed, beach grass, Canada wild-rye, thickspike wheat grass, sand cherry, common and trailing junipers, beach wormwood, silverweed, common or Philadelphia fleabane (*Erigeron philadelphicus*), sand cress, common milkweed, and willows (*Salix* spp.). In addition to sand reed, dune thistle, and thickspike wheatgrass, two other state-threatened plants occur here—both known primarily from Lake Michigan dunes: dune goldenrod and clustered broomrape.

The interdunal wetlands are dominated by lakeshore rush and the sedge *Carex viridula,* with Garber's sedge, Olney-threesquare (*Scirpus americanus*), broadleaf willow, silverweed, spotted Joe-pye-weed (*Eupatorium maculatum*), swamp milkweed (*Asclepias incarnata*), variegated scouring rush, slender arrow- grass, and another sedge (*Eleocharis* sp.) also known to occur (BER files).

Other plant species occurring in the natural area include common strawberry (*Fragaria virginiana*), red osier (*Cornus stolonifera*), evening primrose, Canada blue grass (*Poa compressa*), yellow sweet clover (*Melilotus officinalis*) and white sweet clover (*M. alba*)—prominent invaders throughout most of the dune system, common mullein (*Verbascum thapsus*), pasture or carolina rose (*Rosa carolina*), black-eyed Susan (*Rudbeckia hirta*), garden asparagus (*Asparagus officinallis*), leafy spurge (*Euphorbia esula*), Lombardy or black poplar (*Populus nigra*), white ash, cottonwood, silver maple (*Acer saccharinum*), box elder (*Acer negundo*), paper birch, and quaking aspen. In 1993, hairy puccoon (*Lithospermum croceum*) was discovered in an open area formerly occupied by Scotch pine (J. Bucholz *in litt.* to R. Hoff-

man), which had been removed by work crews.

In recent years, work crews have made a concerted effort to control exotics such as silver poplar (*Populus alba*), Lombardy poplar, leafy spurge, exotic thistles, honeysuckle (*Lonicera* spp.), and common lilac (*Syringa vulgaris*).

Of further interest is the presence of 132 species of Lepidoptera–butterflies and moths: skippers, brush-footed butterflies, wood nymph butterflies, monarch butterflies, tent caterpillar moths, giant silk moths, sphinx moths, prominent moths, tiger moths, tussock moths, and owlet or noctuid moths, including 113 species in the families Arctiidae and Noctuidae. These were documented at Kohler Dunes in 1991, including 3 moth species previously unrecorded in Wisconsin: *Copablepharon longipenne, Euxoa manitobana,* and *Anathix aggressa,* species typically found in the western U.S., particularly *Copablepharon longipenne,* which is disjunct from its western range (Ferge 1991).

Birds. The more common inhabitants, found typically in heath-like and grassy backdunes, are Eastern Bluebird, Common Yellowthroat, Chipping Sparrow, Clay-colored Sparrow, Field Sparrow, Vesper Sparrow, Song Sparrow, and American Goldfinch. Bobolink is uncommon to rare. Each of these species also is characteristic of pine and oak barrens. Foraging in the dunes are Common Grackle, Northern Flicker, Red-winged Blackbird, and Chimney Swift, as well as swallows foraging over sand blows—Tree, Bank, and Barn, and occasionally Northern Rough-winged Swallow. Purple Martin also sometimes occurs here.

Among dune copse in aspen, cottonwood, paper birch, and red maple, occur Mourning Dove, Eastern Kingbird, Blue Jay, Gray Catbird, American Robin, Brown Thrasher, European Starling, (rarely) Warbling Vireo, Chestnut-sided Warbler, Indigo Bunting, Eastern Towhee, House Finch, (rarely) House Sparrow, Song Sparrow, Brown-headed Cowbird, and Northern Cardinal. Among red oak occasionally occur Baltimore Oriole, and in white cedar along the nature trail sometimes occur American Crow, Black-capped Chickadee, Blue Jay, Cedar Waxwing, and Chestnut-sided Warbler. European Starling, Chipping Sparrow, and Mourning Dove sometimes occur in pockets of Scotch pine.

In brushy swales adjacent to interdunal wetlands sometimes occur Yellow Warbler, Common Grackle, American Goldfinch, and Song Sparrow. Interdunal wetlands sometimes attract Red-winged Blackbirds, Common Grackles, and Song Sparrows, but quite often I found no birds in these small 0.4–0.8ha sites, perhaps due to their dry conditions, simple vegetative structure, and apparent low plant density.

A rare occurrence in backdune grassland in low grass and forb cover is the Grasshopper Sparrow.

Along the open beach at the north end of the state natural area, the Ring-billed Gull is prominent; sometimes in early morning Canada Geese loaf here, and occasionally Common Grackle and Killdeer forage along the strand.

Along mixed pine forest edges bordering open dunes occur Yellow

Warbler, Pine Warbler, Black-capped Chickadee, Indigo Bunting, Eastern Towhee, American Robin, and Brown-headed Cowbird. In mixed northern hardwoods and pines occur Ruby-throated Hummingbird, Eastern Wood-Pewee, Downy Woodpecker, Northern Flicker, Great Crested Flycatcher, Red-eyed Vireo, Veery, Chestnut-sided Warbler, American Redstart, Yellow Warbler (edge), Gray Catbird (edge), Indigo Bunting (edge), American Goldfinch (edge), Brown-headed Cowbird, (rarely) House Wren, and Song Sparrow (edge).

Among birds rarely observed on breeding bird surveys at Kohler Dunes were a Cooper's Hawk on 5 June 1993, Mallard, Green Heron, Black-billed Cuckoo, Yellow-bellied Flycatcher, Willow Flycatcher, Winter Wren, Warbling Vireo, Magnolia Warbler, Blackburnian Warbler, Mourning Warbler, Canada Warbler, and House Sparrow. One rare species, recorded a few days after a June breeding bird survey, was the Yellow-throated Warbler, which stayed for about a month, and sang from a large white pine along a western edge bordering the dunes and near the parking lot at the natural area's northern end (Noel Cutright, pers. comm.). The detection of several of these species no doubt is associated with the adjacent Black River marsh system, which runs parallel to the state natural area, and with northern hardwood and white pine stands bordering the dune fields. Some of these birds, however, such as Yellow-bellied Flycatcher and Blackburnian Warbler, may have been late migrants; it's not uncommon for migrants to be still present along the lakeshore during the first week of June.

Point Beach State Forest—Size. About 1,212ha; 10.4km long and 2.4km wide, including 70.7ha in the Point Beach Ridges State Natural Area.

Location. Point Beach State Forest (T20N R25E, S4, 5, 8, 9, 16, 17, 20, 21, 29, 31, 32) lies parallel to Lake Michigan mostly east of Hwy O immediately north of the city of Two Rivers, Manitowoc County.

Access. From northern Manitowoc County, take Hwy 42 south to Hwy V, go east to Hwy O and then about 3.2km (2 miles) south on Hwy O to the state forest entrance. From Two Rivers, take Hwy O (Sandy Bay Road) northeast about 6.4km (4 miles) to the state forest entrance.

Site Description. Point Beach is characterized by alternating ridges and wet swales that parallel the lakeshore. Forest cover, mostly second-growth, consists of mixed northern hardwoods and pines: white pine, red pine, hemlock, white cedar, yellow birch, white birch, red maple, red oak, and black cherry (*Prunus serotina*). Black ash, tamarack (*Larix laricina*), and occasionally white cedar occur in swales. Red maple, hemlock, and birch are common, with several red pine plantations established on ridges and backdunes.

Point Beach State Forest includes: about 1,539m of beach adjacent to extensive dunes and swales; a 117ha campground and recreation area; the Wilderness Ridge Natural Area—3.2ha of ridge and swale mixed hardwoods, white pine, and hemlock; and the Point Beach Ridges State Natural

Area, 70.7ha of the following community types: northern mesic forest (36.4ha), northern wet-mesic forest (20.2ha), lake dune (8.1ha), lake beach (4.8ha), and pine plantation (1.2ha). Two large cedar swamps occur in the northern half of the forest.

Soils are predominantly sand, with layers of organic muck in the swales and cedar swamps. Molash Creek, about 5.6km long, runs through southern portions of the forest into Lake Michigan.

The distinctive ridge and swale topography features a diversity of common and rare plant species, including a variety of shrubs, grasses, forbs, ericads—such as trailing arbutus, and several native orchids. On the upper beaches and dunes, sand reed, beach grass, beach pea, and clustered broom-rape are dominant, with three endangered and threatened species also present: dune-willow (endangered), dune thistle (threatened), and thickspike wheatgrass (threatened).

A variety of mammals occurs here, including white-tailed deer, red fox, grey squirrel, cottontail rabbit, raccoon, skunk, porcupine, and chipmunk. But, campers and hikers beware, the site is renowned for its mosquitoes.

Woodland Dunes, a 303ha privately held nature center, lies 3.2km south of Two Rivers and 3.2km inland. From a landscape perspective, it has been linked by BER's Natural Heritage Section to the Point Beach Ridges State Natural Area and described as the "Point Beach Ridges-Woodland Dunes Macrosite." Woodland Dunes, although not representative of a lake beach and dune complex, contains many of the remarkable botanical and avian features of dune ridges and swales associated with the Point Beach State Forest. But there are also notable differences, particularly the presence of southern community elements.

Woodland Dunes has 9 different plant communities, including wet-mesic southern hardwoods, mesic northern hardwoods, shrub-carr, dry meadow, wet meadow, sedge meadow, emergent aquatic, conifer plantation, and agricultural (Steffen 1979). The similarities and differences in birdlife from that found at Point Beach are mentioned below.

Birds. During the breeding season at Point Beach, on open dry beach, Killdeer nest, American Crow and Common Grackle feed on dead alewives, and thousands of Ring-billed Gulls and scores of Herring Gulls loaf. A few Canada Geese, too, may loaf along stretches of upper sand beach. Ring-billed Gulls and Caspian Terns commonly forage in nearshore waters. Bonaparte's Gull sometimes occurs along the shore as well. Rarely observed at Point Beach during summer is the Common Tern. These species have also been recorded at Woodland Dunes, although the terns mostly in low number or rarely.

Other shorebirds observed (uncommonly to rarely) during the breeding season along the beach at Point Beach include: Black-bellied Plover, Ruddy Turnstone, Sanderling, and Dunlin. None of these typically coast-loving species have been observed at Woodland Dunes during summer.

Shorebirds and birds not observed at Point Beach but recorded at

Woodland Dunes during summer due to the abundance of wetland habitats are: Common Loon (rarely), Black-crowned Night-Heron (rarely), American Bittern, Least Bittern, Blue-winged Teal, Green-winged Teal, Wood Duck, Osprey (rarely), Northern Harrier, Common Gallinule (rarely), American Coot, Virginia Rail, Sora, American Woodcock, Common Snipe, Upland Sandpiper, Greater Yellowlegs (rarely), Wilson's Phalarope (rarely), Little Gull (very rare), Marsh Wren, and Yellow-headed Blackbird.

In sand reed-beach grass-beach pea strand and foredune habitats at Point Beach, Savannah Sparrow and Spotted Sandpiper sometimes occur. Spotted Sandpiper also frequents the sandy edges of Molash Creek near Lake Michigan. Savannah Sparrow is much more abundant at Woodland Dunes, where it occurs in agricultural and grass habitats and sedge meadow. Northern Flicker, Purple Martin (in low number and infrequently), Tree Swallow, Northern Rough-winged Swallow, Cliff Swallow (rarely), Barn Swallow, and American Goldfinch have been observed foraging in and over foredunes and backdunes, including dune copse, and along forested dune edges bordering open backdunes. Eastern Bluebird, Bobolink, and Eastern Meadowlark (rarely) occur in low number in mixed grass and shrubby backdunes. Clay-colored Sparrow and (rarely) Field Sparrow occur in low, brushy backdunes. Northern Harrier, Western Meadowlark, Dickcissel, Grasshopper Sparrow, Henslow's Sparrow, and Vesper Sparrow, all documented in grass habitats at Woodland Dunes, have not been recorded at Point Beach.

Horned Lark (in low numbers), Rock Dove, and Common Nighthawk occur at Woodland Dunes during summer but have not been observed during breeding bird surveys at Point Beach.

The Great Blue Heron, Green Heron, Black Duck, Mallard, Belted Kingfisher, and Red-winged Blackbird have been observed at Molash Creek near the sandy outlet on Lake Michigan. Except for Black Duck and Baltimore Oriole, these same species have also occurred in marsh habitats at Woodland Dunes. American Redstart, Common Yellowthroat, Song Sparrow, and American Goldfinch have also occurred at Molash Creek in shrubby thickets. Baltimore Oriole occurred once at the creek edge.

Seldom observed in flight over forested dune edges at Point Beach is American Kestrel (found at Woodland Dunes in low number), and Turkey Vulture, a species not recorded at Woodland Dunes. Also inhabiting shrubby dune edges and dune copse are Eastern Kingbird, Gray Catbird, Black-capped Chickadee, Eastern Towhee, and Song Sparrow.

In wooded dune ridge habitats at Point Beach, Great Crested Flycatcher, Veery, Red-eyed Vireo, Ovenbird, and Black-throated Green Warbler commonly occur (all in white pine-red pine-white birch); in red maple-hemlock-cedar occur Veery, Scarlet Tanager, Common Grackle, Eastern Wood Pewee, and Chimney Swift (rarely); in white pine-hemlock-white birch commonly occur Ovenbird, Red-eyed Vireo, Black-throated Green Warbler (in

hemlock), and occasionally Magnolia Warbler; and in northern white cedar-white birch ridge, with scattered hemlock, commonly occur Ovenbird, Red-eyed Vireo, and Veery. In canopy openings occur Northern Flicker, Indigo Bunting, Eastern Wood-Pewee, Least Flycatcher, Great Crested Flycatcher, American Robin, House Wren, Chestnut-sided Warbler, Eastern Towhee, Song Sparrow, and House Finch (the latter 5 also along wooded dune edges bordering open dunes).

Other species observed in mixed-wooded dune ridges include: Merlin (rarely), Ruffed Grouse, Wild Turkey (rarely), Mourning Dove (also in dune copse and along Molash Creek), Black-billed Cuckoo, Downy Woodpecker, Hairy Woodpecker, Pileated Woodpecker, Blue Jay, American Crow, Black-capped Chickadee, Red-breasted Nuthatch, White-breasted Nuthatch, Brown Creeper, Blue-gray Gnatcatcher (recorded only once; typically a southern mesic to wet-mesic forest bird), Wood Thrush (rarely), Cedar Waxwing, European Starling (rare), Yellow-throated Vireo (rarely), Solitary Vireo (uncommon and in low number; not recorded at Woodland Dunes), Magnolia Warbler, Yellow-rumped Warbler, American Redstart, Hooded Warbler (recorded only once), Northern Cardinal, Rose-breasted Grosbeak, Chipping Sparrow, White-throated Sparrow, Brown-headed Cowbird, and House Sparrow.

In moist to wet forested swales at the Point Beach Ridges Natural Area occur the Red-shouldered Hawk, Barred Owl, Ruby-throated Hummingbird (rarely), Olive-sided Flycatcher, Alder Flycatcher (alder/shrub thickets), Nashville Warbler, Yellow Warbler, Common Yellowthroat, Northern Waterthrush, Canada Warbler, Veery, and American Goldfinch. In black ash swales occur Scarlet Tanager and American Redstart. In hemlock-cedar-black ash swales are Chimney Swift, Veery, Black-throated Green Warbler, Blackburnian Warbler, Mourning Warbler, and Common Grackle. Also occurring are: Canada Warbler, Winter Wren (uncommon), Sedge Wren, Northern Waterthrush (in cedar swale), Yellow-rumped Warbler, Black-throated Green Warbler, Blue Jay (in cedar swale), House Wren and House Finch (in open black ash swale), Song Sparrow (in alder thickets), Swamp Sparrow, and White-throated Sparrow. Along swale edges and openings occur Black-and-White Warbler, Blue Jay, Northern Waterthrush, Indigo Bunting, Great Crested Flycatcher, American Crow, Common Yellowthroat, Barn Swallow, American Robin, and Eastern Towhee.

All of these dune ridge and swale birds have been documented in ridge and swale habitats at Woodland Dunes as well (Steffen 1979). In addition, some species typically occurring in, or restricted to, southern Wisconsin have been recorded at Woodland Dunes. These include: Yellow-billed Cuckoo, Acadian Flycatcher (rarely), Willow Flycatcher, White-eyed Vireo, Blue-winged Warbler, Cerulean Warbler, and Louisiana Waterthrush, as well as Blue-gray Gnatcatcher and Hooded Warbler. The Sharp-shinned Hawk, Gray Partridge, Great Horned Owl, Whip-

poor-will, Red-headed Woodpecker, Yellow-bellied Flycatcher, Golden-crowned Kinglet, Ruby-crowned Kinglet, Blue-winged Warbler, Northern Parula Warbler, Connecticut Warbler, Purple Finch, Brewer's Blackbird, and White-crowned Sparrow also absent from Point Beach lake dune ridge and swale surveys examined for this paper, have occurred rarely at Woodland Dunes. More common at Woodland Dunes, but not observed at Point Beach: Red-tailed Hawk, Broad-winged Hawk, Ring-necked Pheasant, Eastern Phoebe, Brown Thrasher, Warbling Vireo, and Golden-winged Warbler.

The most rare of all Woodland Dunes' sightings was that of a Carolina Wren in 1976 (Steffen 1979), a rare occurrence anywhere in Wisconsin.

Whitefish Dunes State Park—Size. About 162ha+, including the 92.9ha Whitefish Dunes State Natural Area.

Location. South of Cave Point on Lake Michigan in eastern Door County (T28N R27E S2,3,10).

Access. From Sturgeon Bay take Hwy 57 northeast through the town of Institute; then 1.6 km (1 mile) northeast of Valmy take Clark Lake Road directly east and northeast to the park entrance.

Site Description. Tans and Dawson (1980) described the area as containing "the best developed open and stabilized Lake Michigan sand dunes and high quality beach in the state." This, despite the fact that roughly one-half of the historic beach/lake dune system has been compromised by human development. A rich assemblage of plant species, several restricted to Great Lakes' coasts, occurs in active and stabilized dunes. Many species found here represent a broad array of community types, including: lake beach, lake dune, dry-mesic, mesic, and wet-mesic prairie, bracken grassland, oak barrens, southern dry forest, southern wet forest, northern dry forest, northern dry-mesic forest, northern mesic forest, northern wet-mesic forest, northern wet forest, southern wet forest, shrub carr, cedar glade, and even boreal forest.

The Whitefish Dunes State Natural Area features 47.3ha of northern mesic forest dominated by beech and sugar maple, with balsam fir, white pine, hemlock, white birch, yellow birch, red oak, white cedar, hornbeam (*Ostrya virginiana*), and mountain maple (*Acer spicatum*). Round-leaved dogwood (*Cornus rugosa*), beaked hazelnut (*Corylus cornuta*), choke cherry (*Prunus virginiana*), and bristly black currant (*Ribes lacustre*) are predominant in the shrub layer on old dune ridges in northern and northeastern portions of the natural area. There are also 26.7ha of lake dune parallel to the shore, 14.1ha of northern wet-mesic forest (white cedar, fir, and hemlock) northeast of the northern mesic forest, 3.2ha of beach, and 1.6ha of northern sedge meadow bordering Clark Lake in the northern end of the park.

Also present is a large area of old field, mixed conifers-hardwoods, and grazed woods dominated by white cedar, fir, mountain maple, and white birch in the southern portions of the park.

Nearly 3km of beach and lake dune extend beyond the Natural Area border southwest toward White-

fish Bay, but most of it has been altered by homes and roads. Rising lake levels are an omnipresent threat to beach and foredune erosion. The beach is unvegetated and heavily used during summer, but sea rocket and seaside spurge have occurred here and can colonize the beach, along with sand reed and beach grass.

Foredune grass, forb, and shrub species include: thickspike wheatgrass, beach grass, sand reed, Virginia wild-rye (*Elymus virginicus*), dune thistle, beach pea, white sage (western mugwort) (*Artemisia ludoviciana*), common milkweed, poison ivy, smooth rose, spreading dogbane (*Apocynum androsaemifolium*), Canada yew (rare), starry false Solomon's-seal, and red osier dogwood. Mountain maple, white birch, white cedar, and hemlock occur rarely on foredunes.

On the backside of foredunes grading into backdunes commonly occur: poison ivy and Canada yew, with wild sarsaparilla (*Aralia nudicaulis*), big- leaved aster (*Aster macrophyllus*), round-leaved dogwood, mountain maple, bush- honeysuckle, wild strawberry, sand cherry, pin cherry, bracken fern (*Pteridium aquilinum*), thimbleberry (*Rubus parviflorus*), and beach wormwood; rare are: yarrow, thimbleweed (*Anemone cylindrica*), sand cress, beaked hazelnut, mountain honeysuckle (*Lonicera dioca*), Canada mayflower (*Maianthemum canadense*), white sage, common milkweed, red osier dogwood, rough fleabane, bedstraw (*Galium* sp.), dwarf lake iris, evening primrose, choke cherry, smooth sumac (*Rhus glabra*), red raspberry (*Rubus strigosus*), buffalo berry (*Shepherdia canadensis*), sticky catchfly (*Silene antirrhina*), American highbush cranberry (*Viburnum trilobum*), the state threatened dune goldenrod, and sweet white violet (*Viola pallens*).

Among tree species on the backside of foredunes, paper birch, balsam fir, and sugar maple are abundant to common; yellow birch, balsam poplar, and quaking aspen are rare.

On backdunes, bush-honeysuckle, thimbleberry, and false Solomon's-seal are dominant; commonly occurring are: columbine (*Aquilegia canadensis*), white sage, wood strawberry (*Fragaria vesca*), common juniper, poison ivy, staghorn sumac (*Rhus typhina*), and yellow goat's beard (*Tragopogon pratensis*). The following species occur rarely: yarrow, smooth juneberry (*Amelanchier laevis*), thimbleweed, sand cress, dwarf lake iris, common milkweed, American bittersweet (*Celastrus scandens*), red osier dogwood, beaked hazelnut, Canada wild-rye, mountain honeysuckle, white sweet clover, evening primrose, smooth Solomon's-seal (*Polygonatum biflorum*), pin cherry, choke cherry, American mountain ash (*Pyrus americana*), smooth sumac, bristly black currant, smooth rose, red raspberry, sticky catchfly, Canada yew, and lowbush blueberry (*Vaccinium angustifolium*).

Bigtooth aspen (*Populus grandidentata*) and paper birch occur commonly; occurring rarely in backdunes are red maple, yellow birch, and quaking aspen.

On stabilized backdune blowouts occur the co-dominants Canada bluegrass and orange hawkweed (*Hieracium aurantiacum*), with bracken fern and staghorn sumac

common; rare here are: thimbleweed, common milkweed, wild strawberry, common blackberry (*Rubus allegheniensis*), and yellow goat's beard.

In wooded dunes, mature American beech is dominant, with sugar maple, white pine, and eastern hemlock common. Canada yew dominates much of the eastern and northern dune slopes.

Birds. Nearly 20 years ago, Libby Zimmerman wrote: *"In May, Barred Owls and Pileated Woodpeckers called from the cedar swamp near Clark Lake. Brown Creepers seemed sporadic, but they probably bred there. Winter Wrens are easy to hear in spring migration, associated with low mats of yew, but have either disappeared or become silent by mid–June. Another forest bird observed in May only was the Hermit Thrush. The forest belongs most of all to the Ovenbird, which was the most abundant bird* [in May–June 1976 and June 1977]. *The other most abundant species were, in 1976, the Eastern Wood Pewee, Black-capped Chickadee, and Black-throated Green Warbler, and in 1977, the Red-eyed Vireo, Veery, American Redstart, and Black-capped Chickadee. Other typical deciduous forest birds are Broad-winged Hawk, Ruffed Grouse, Whip-poor-will, Great Crested Flycatcher, and Wood Thrush. Some interesting species to look for here are Cerulean, Chestnut-sided, and Canada Warblers."* (Tessen 1979)

The birdlife is similar today, with the Ovenbird the most abundant bird encountered on breeding bird surveys. In general, the beech-dominated wooded dunes contain all of the species observed by Zimmerman, as well as: Chimney Swift, Downy Woodpecker, Hairy Woodpecker, Northern Flicker, Pileated Woodpecker (rare), Blue Jay, American Crow, Red-breasted Nuthatch (rare), White-breasted Nuthatch, American Robin, Hermit Thrush, Cedar Waxwing, Warbling Vireo, Chestnut-sided Warbler, Yellow-rumped Warbler, Common Yellowthroat, Cerulean Warbler, Canada Warbler, Pine Warbler (rare), Black and White Warbler, Baltimore Oriole, Common Grackle, Brown-headed Cowbird, Scarlet Tanager, Rose-breasted Grosbeak, White-throated Sparrow, Chipping Sparrow, and American Goldfinch (edge).

To the west and southwest of the northern mesic forest, in partially wooded dune slopes occur Mourning Dove, Purple Martin, Tree Swallow, Cliff Swallow, American Crow, American Robin, European Starling, Brown Thrasher, House Wren, Northern Flicker, Warbling Vireo, Eastern Towhee, American Goldfinch, American Redstart, and Indigo Bunting. In backdune grassland (old field), including dune copse, occur Purple Martin, Tree Swallow, Eastern Bluebird, Yellow Warbler, Indigo Bunting, Grasshopper Sparrow (rare), Clay-colored Sparrow, Common Grackle, and American Goldfinch.

Along the beach during summer occur loafing Ring-billed Gulls and Herring Gulls.

The most unlikely breeding season observation at Whitefish Dunes occurred on 15 June 1976: a lone Yellow-breasted Chat (BER files).

Long Island, Apostle Islands National Lakeshore—Size. About 5km long, within the National Park Service's

Apostle Islands National Lakeshore (AINL); 75–380m wide.

Location. Northern Ashland County on Lake Superior at the head of Chequamegon Bay (T49N R4W S13; T49N R3W S17,18,20).

Access. By motorboat, sea kayak, canoe (if waters are calm and weather favorable), or sailboat from Bayfield, Washburn, Ashland, or Madeline Island.

Site Description. Since 1975, Long Island has been connected to Chequamegon Point to form a long barrier spit. Long Island may become, as it has historically, a barrier island when separated from Chequamegon Point as a result of high water and severe storm surge. This site is comprised of 12 parallel sand ridges reaching 4.6m high that alternate with swales at or below lake level. Red pine, Hill's oak, and jack pine are dominant on dune ridges, with red pine and oak forest understory comprised mainly of common juniper, huckleberry (*Gaylussacia* sp.), lowbush blueberry, and bracken fern. Jack pine stands have an understory consisting mainly of common juniper, false-heather, bearberry, common hairgrass, sand cress, three-toothed cinquefoil (mountain white potentilla) (*Potentilla tridentata*), and reindeer lichen (*Cladina rangiferina*). Swales are dominated by bluejoint (*Calamagrostis canadensis*), leatherleaf (*Chamaedaphne calyculata*), and fowl mannagrass (*Glyceria striata*), except at the island's northwest tip, where jack pine and willows (*Salix* spp.) predominate.

Sphagnum-sedge bogs on the island's bay side are characterized by sedges, ericads, sweet gale (*Myrica gale*), insectivores, and sweet flag (*Acorus calamus*), with scattered white pines and tamaracks.

Interdunal pools at the island's western end are dominated by watermilfoil (*Myriophyllum heterophyllum*), with foxtail (*Alopecurus aequalis*), water star-grass (*Heteranthera dubia*), and rushes (*Juncus* spp.) and sedges (*Carex* spp.) dominating pool margins. Open dunes and swales are vegetated with grasses and willows (*Salix* spp.), and along the island's southern end, sweet gale. Dune copse of speckled alder, green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), white birch, and quaking aspen are prominent along the island's southern end for about 1.6km, with dune-willow dominant on dune crests on the island's northern face, where jack pine and common juniper comprise a dune savanna inland.

The area known as the Sand Cut, which links Chequamegon Point to Long Island, has evolved over the past 20 years into a botanically rich wet sedge-and-rush meadow bordering a sand tombolo and ephemeral pools.

The National Park Service acquired approximately 200ha in 1986 and is responsible for management.

Birds. The island is renowned for attracting migrant shorebirds, several of which may be present during the breeding season as late spring or early fall migrants. The following have occurred on beaches, sandbars, ephemeral dune pools, and along edges and openings of the sandy Sand Cut sedge meadow: Black-bellied Plover, Lesser Golden Plover, Semipalmated Plover, Piping Plover (rare, formerly beach-nesting), Killdeer (beach-nesting, also present

regularly in foredunes), Greater Yellowlegs (uncommon), Lesser Yellowlegs, Willet, Spotted Sandpiper (foredune-nesting), Upland Sandpiper, Whimbrel, Hudsonian Godwit (rare), Marbled Godwit (rare), Ruddy Turnstone, Red Knot (rare), Sanderling, Semipalmated Sandpiper, Least Sandpiper, White-rumped Sandpiper (rare), Baird's Sandpiper, Pectoral Sandpiper (rare), Buff-breasted Sandpiper (rare), Dunlin, Short-billed Dowitcher, Long-billed Dowitcher (early May and October only—Sam Robbins, pers. comm.), Common Snipe, and Wilson's Phalarope (rare, dune pool only).

Loafing on beaches at the island's northern and southeastern ends commonly are Canada Geese (particularly in late summer), Red-breasted Mergansers, Common Mergansers, Ring-billed Gulls, Herring Gulls, Caspian Terns, Common Terns, infrequently Bonaparte's Gulls (late spring); and also in late summer, occasionally Black Terns, Bonaparte's Gulls, and immature Double-crested Cormorants. Rare waterbird sightings along the shore have included Franklin's Gull, American White Pelican, immature White-winged Scoter, and Brant.

Savannah Sparrows occur regularly in *Ammophila/Lathyrus* habitats during summer, Horned Larks occasionally. Eastern Bluebird occurs infrequently in backdunes, sometimes in savanna-like openings. Indigo Bunting occurs occasionally in shrubby backdunes and along mixed forest edges. Western Meadowlark was observed once in backdune grasses. In dune copse occasionally occur American Redstart, Red-eyed Vireo, Nashville Warbler, Black-throated Green Warbler, Song Sparrow, and Chipping Sparrow. Northern Harrier and sometimes Merlin infrequently hunt over dunes and the Sand Cut sedge meadow. Northern Flickers, Tree Swallows, Cliff Swallows, Northern Rough-winged Swallows, and Barn Swallows forage along the shoreline and in or over dune habitats. Common Grackles forage along the shore and in the Sand Cut area.

Yellow Warbler, Common Yellowthroat, Red-winged Blackbird, and Song Sparrow inhabit shrubby thickets adjacent to the sedge meadow. Yellow-headed Blackbird occurs rarely in the Sand Cut sedge meadow. A lone Great Blue Heron sometimes forages in the ephemeral sand pools adjacent to the sedge meadow, an area that regularly attracts immature and subadult Bald Eagles. Mallard, American Black Duck (uncommon), Green-winged Teal, Blue-winged Teal, and Gadwall also are sometimes present in the ephemeral pools, rarely Common Pintail. Observed near shore have been Common Loon, American Wigeon, Redhead, Lesser Scaup, Greater Scaup, and Redhead.

Among mixed coniferous-deciduous forested dune ridges during the breeding season occur Veery, Red-eyed Vireo, Black-throated Green Warbler, Ovenbird, American Redstart, Nashville Warbler, Common Yellowthroat, Yellow Warbler, Black-billed Cuckoo, Ruby-throated Hummingbird, Winter Wren, Hairy Woodpecker, Downy Woodpecker, Eastern Kingbird, Great Crested Flycatcher, Eastern Phoebe (nesting under eaves at interior cabin), Eastern Wood-Pewee, Song Sparrow, White-

throated Sparrow, Chipping Sparrow, Pine Siskin, Merlin (uncommon), Sharp-shinned Hawk (rare), Broad-winged Hawk, Turkey Vulture (uncommon), Long-eared Owl (rare), Ruffed Grouse (uncommon), Blue Jay, Northern Raven, American Crow, Black-capped Chickadee, Red-breasted Nuthatch, Brown Creeper, American Robin, Wood Thrush, Cedar Waxwing, Baltimore Oriole (among Hill's oak), Brown-headed Cowbird, Rose-breasted Grosbeak, Indigo Bunting, and Eastern Kingbird, in scrubby openings and dune copse, and Belted Kingfisher along edges.

In wet swales, bogs, and alder thickets occur Winter Wren (uncommon), Gray Catbird, Veery, Red-eyed Vireo, Common Yellowthroat, American Redstart, Yellow Warbler, Yellow-rumped Warbler, Black-throated Green Warbler, Blackburnian Warbler (uncommon), Tennessee Warbler (rare), Palm Warbler (rare), Golden-winged Warbler (uncommon), Chestnut-sided Warbler, Nashville Warbler, Alder Flycatcher, American Goldfinch, Song Sparrow, Chipping Sparrow, White-throated Sparrow, Red-winged Blackbird, Brown-headed Cowbird, Eastern Kingbird, Barn Swallow, Cedar Waxwing, and Common Grackle.

Outer Island Sandspit, Apostle Islands National Lakeshore—Size. 93.7ha: lake dunes and beach: 29.1ha; pine savanna: 19.4ha; northern dry forest: 4.8ha; shallow lagoon: 21.8ha; open bog: 18.6ha.

Location. Northeastern Apostle Islands (T52N R01W S2,3,10,11), about 34km from Bayfield on Lake Superior.

Access. By motorboat, sea kayak, or sailboat from Bayfield or from within the Apostle Islands.

Site Description. The sandspit extends north-south for about 2.4km. A narrow, unvegetated beach (3–6.1m wide) borders Lake Superior on the west and grades into a low foredune, 9.1–21.3m wide, stabilized by beach grass and beach wormwood; pines stand to the east. The beach on the east shore of the spit is slightly wider and lies adjacent to low dunes and swales. Vegetated portions of the east beach contain beach grass and scattered driftwood.

Foredune species include, in addition to beach grass and beach wormwood: Canada wild-rye, evening primrose, common horsetail (rare), sand cress (rare), scouring rush (*Equisetum* sp.), common juniper, beach pea, sand cherry, sandbar willow (rare), and balsam poplar (rare).

The rear side of the foredune grades into the first swale and second dune. The swales here are shallow and the dune field low and rolling. The central portion of the sand spit's dune field borders mixed coniferous woods to the east; northward it grades into a brush zone bordering the lagoon, and south it extends across a narrow spit. Beach grass and beach wormwood occur in central portions, but in fewer numbers, and they are interspersed in a more diverse vegetation that features several low shrubs, presenting a heath-like appearance. Other species include common hairgrass, slender wheat grass (*Agropyron trachycaulum*), tickle-grass, short-leaf fescue (*Festuca saximontana*), three-toothed cinquefoil, Canada wild-rye, Canada bluegrass, Canada hawkweed (*Hieracium cana-*

dense), sticky hawkweed (*H. scabrum*), false-heather, bearberry, bastard toadflax, fireweed, quack grass, sand cress, thick-leaved wild strawberry (*Fragaria vesca*), common juniper (dominant on central backdunes), sand cherry, pin cherry, and jointweed (*Polygonella articulata*).

North of the dunes, a white pine-dominated savanna with several small openings occurs; red and jack pine are prominent. Reindeer-moss lichens (*Cladonia* spp.) carpet the sand, especially *C. mitis* and *C. rangiferina*. Also commonly occurring in the barrens-like openings are: pearly everlasting (*Anaphalis margaritaceae*), spreading dogbane, bearberry, beach wormwood, *Carex* sp., bastard toadflax, poverty oat grass (*Panthonia spicata*), common hairgrass, fescue, Canada hawkweed, sticky hawkweed, beach heath, common juniper, cow wheat (*Melampyrum lineare*), panic grass (*Panicum columbianum*), three-toothed cinquefoil, and lowbush blueberry.

In sheltered interior woods that lie to the east occur white spruce, balsam fir, red maple, and paper birch. Together with pine savanna elements, a total of 75 species of vascular plants and lichens have been documented, including 21 species of lichens. Southeast of the pine savanna lies a mature stand of red pine.

On the sandy margins of the shallow lagoon occur rushes (*Juncus canadensis* and *J. pelocarpus*), bulrush (*Scirpus torreyi*), spike-rushes (*Eleocharis smallii* and *E. robbinsii*), three-way sedge (*Dulichium arundinaceum*), sweet gale, lance-leaved violet (*Viola lanceolata*) and creeping spearwort (*Ranunculus reptans*); southwest from the lagoon pole-sized white pine and paper birch occur. The southern and southeastern ends of the lagoon are contiguous to an open sphagnum-sedge bog mat with Labrador-tea (*Ledum groenlandicum*), leatherleaf, bog-rosemary (*Andromeda glaucophylla*), and bog- laurel (swamp laurel) (*Kalmia polifolia*) present, and tamarack, paper birch, white pine, and black spruce occurring along the edges.

South of the lagoon, four small, isolated swales within the mixed coniferous forest support a bog-marsh flora that features occasional hummocks of sphagnum moss.

Birds. During the breeding season at the southern end of the sand spit, on sand beach and gravel bars, loaf Double-crested Cormorants, Red-breasted Mergansers, Common Mergansers, Bonaparte's Gulls (rare), Herring Gulls (which nested unsuccessfully here in 1974, 1976, and 1979), and Ring-billed Gulls. Foraging along the open beach in late spring occur Ruddy Turnstone, Sanderling, Semipalmated Sandpiper, Least Sandpiper, Dunlin, and Killdeer. Occasionally observed at this time may be Black-bellied Plover, Lesser Golden Plover, Semipalmated Plover, Greater Yellowlegs, and Baird's Sandpiper. Very rare is the Hudsonian Godwit, recorded here only once—26 May 1977 (Harris and Jaeger 1978). Killdeer occasionally nest on open gravel-sand beach in the upper reaches of the strand.

Harris and Jaeger (1978) recorded Bank, Northern Rough-winged, and Barn Swallows nesting on south Outer, the latter species observed

nesting in an abandoned fisherman's shack that no longer stands.

Spotted Sandpiper nest in foredune areas and rarely in heath-like backdunes. Rarely occurring in grassy backdunes is either meadowlark species. In shrubby pine savanna edges occur Song Sparrow, and in mixed pines, Chipping Sparrow. American Woodcock may nest in open areas adjacent to or within pine savanna.

Rare migrant passerines—documented as late as 28 May—that have occurred on the spit include American Pipit and Lapland Longspur, and a male Chestnut-collared Longspur in breeding plumage was observed on 27 May 1976 (Harris and Jaeger 1978).

Turkey Vulture, Bald Eagle, Northern Harrier, Sharp-shinned Hawk, Cooper's Hawk, Broad-winged Hawk, Red-tailed Hawk, and American Kestrel are occasionally observed in late May and/or early June in flight over the sand spit. Merlins regularly forage along strand and dune habitats, sometimes no more than 3m above the substrate. On 2 June 1991, I found a Merlin nest 2m from the top of a pole-sized, 15m-tall white pine. The nest was comprised of white and red pine boughs and sticks; it contained 4 eggs. The nest tree stood on a narrow sand ridge dominated by white pine and white birch, located just south of the lagoon, approximately 60m east of the lake shore.

In the spit's conifer-dominated mixed woodlands occur Mourning Dove (rare), Barred Owl (rare), Broad-winged Hawk (uncommon), Red-tailed Hawk (rare), Eastern Wood-Pewee, Veery (occasionally), Hermit Thrush, Wood Thrush, American Robin, Cedar Waxwing, Red-eyed Vireo, Nashville Warbler, Chestnut-sided Warbler, Yellow-rumped Warbler, Black-throated Green Warbler, Blackburnian Warbler, American Redstart, Ovenbird, Purple Finch, Eastern Towhee (typically in jack pine), Dark-eyed Junco (rare), and Chipping Sparrow (usually in red pine).

Along the wooded/shrubby margins of bog and lagoon occur Alder Flycatcher, Common Yellowthroat, Yellow Warbler, Nashville Warbler, American Redstart, Canada Warbler, rarely Wilson's Warbler (which may be a late migrant or could conceivably nest here), Song Sparrow, Swamp Sparrow, White-throated Sparrow, and Red-winged Blackbird. A pair of Common Loons nested on the lagoon ("South Pond") in 1976 (Harris and Jaeger 1978). And Harris and Jaeger noted the presence of a LeConte's Sparrow on the lagoon on 28 May 1976 and earlier during May in 1976 and 1977.

Wisconsin Point—Size. About 4km long and 121.2ha in size.

Location. Northeast of the city of Superior at the northern extremity of Douglas County (T49N R13W S27,28,34,35). Wisconsin Point is bordered by Allouez Bay to the southwest and Lake Superior to the northeast. Together with the adjacent Minnesota Point, Wisconsin Point separates Lake Superior from the Duluth-Superior Harbor and the mouth of the St. Louis River.

Access. From east of Superior on Hwys 2 and 53, turn east onto Moccasin Mike Road. Follow this road for about 3.2km (2 miles) at which point

it curves northwest toward Allouez Bay and Lake Superior.

Site Description. A long, narrow barrier spit with broad, unvegetated beaches (10–20m wide) and low broken sand dunes, about 2–3m above lake level and dominated by beach grass and beach pea, occurs on the lake side. Other common dune species here include sand cherry, beach wormwood, wild-rye, evening primrose, false heather, bearberry, thick-leaved wild strawberry, common milkweed, and jointweed. Balsam poplar, white birch, green ash, and willow shrubs dominate backdune edges in patches. Pines are planted in backdunes near the west end.

The bay side is vegetated to the water's edge, except for a narrow, disturbed beach at the western end. Along the brushy water's edge occur speckled alder, sweet gale, swamp birch (*Betula pumila*), and willows (*Salix* spp.). A northern dry-mesic forest featuring mature red and white pine dominates central areas, with paper birch, white spruce, and red maple intermixed. Beaked hazel is dense and dominates the shrub layer, with mountain maple dominant in some areas.

Several moist swales occur parallel to the long axis of the spit. Boreal elements include white spruce and white cedar. A 1ha interdunal wetland behind the backdunes near the northwestern tip of Wisconsin Point, and adjacent to an alder thicket, supports a large population of the rare marsh grass-of-parnassus and variegated scouring rush; other characteristic species include sedges *Carex aurea* and *Carex viridula,* smooth scouring rush (*Equisetum laevigatum*), wire-rush, beak-rush (*Rhynchospora capitellata*), fowl-mannagrass, common flat-topped goldenrod (*Solidago graminifolia*), sweet gale, swamp-birch, and willows (*Salix* spp.).

A blacktop road traverses the entire length of the point's bay side and passes planted pines, including Scotch pine. Weedy species predominate along the roadside; there are dense patches of poison ivy, common horsetail, and common scouring rush (*E. hyemale*) present. Management here should include closings of some turn-outs to prevent further human disturbance, which can be heavy at times, largely due to the site's proximity to urban areas.

A U.S. Coast Guard Station and breakwaters occur at the site's western end. The breakwaters may affect the longshore transport of sediments necessary for beach replenishment. This is a situation requiring further study to determine potential long-term impacts not only on the beach and dune communities but on tourism, for without the dunes and beaches the area would not receive the extensive visitation it does.

An open freshwater marsh, dominated by cattails and sedges (*Carex* and *Scirpus* spp.), with burreed (*Sparganium* spp.), water lillies (*Nuphar* and *Nymphaea* spp.), arrowhead (*Sagittaria latifolia*), rushes (*Juncus* spp.), and wild rice (*Zizania aquatica*), rims the southerly and eastward ends of Allouez Bay. Water is shallow here, about a meter deep, which allows for a fairly broad interspersion of emergent aquatics.

Birds. Due to its geographic location at the head of Allouez Bay on the extreme southwestern end of Lake Superior, this site, along with the adjacent Minnesota Point, serves

as a funnel for migrants and is one of the best sites in the state to watch waterfowl and shorebirds during spring and fall migration; hawks and passerines, too, may be numerous. Niemi et al. (1979) commented on the abundant passerine migration here and on Minnesota Point: *"In general, the sheer diversity of passerine species migrating through the* [St. Louis River] *estuary was rivaled by few areas in the upper midwest. During peak migration and when inclement weather 'grounded' migrants, the brush and wooded areas along Minnesota and Wisconsin Points were literally 'alive' with birds. . . . During transect counts . . . we often were forced to simply estimate the number of passerines (in terms of '100's') because it was impossible to count all individuals let alone identify them to species. The largest concentrations of passerines occurred during peak migration periods in mid to late May and once again in late August and early September. At these times, under proper weather conditions, thousands of passerines pass through the estuary."*

Noteworthy records recorded from Wisconsin Point during migration include Pacific Loon, Red-throated Loon, Red-necked Grebe, White-winged Scoter, Black Scoter, Surf Scoter, Harlequin Duck, Oldsquaw, jaegers, Iceland Gull, Great Black-backed Gull, Thayer's Gull, Little Gull, Laughing Gull, Sabine's Gull, Black-legged Kittiwake, Glaucous Gull, Franklin's Gull, Arctic Tern, Red Knot, Buff-breasted Sandpiper, Whimbrel, Marbled and Hudsonian Godwits, Northern Phalarope, Red Knot, Stilt Sandpiper, Cassin's Kingbird, Parasatic Jaeger, Northern Mockingbird, Short-eared Owl, and Hoary Redpoll (Tessen 1976, 1979; Niemi *et al.* 1977).

Niemi *et al.* (1979) listed 31 shorebird species, mainly on Wisconsin and Minnesota points, including peak migration counts in late May for Ruddy Turnstone (554), Semipalmated Sandpiper (1083), and Sanderling (261). The Piping Plover formerly nested on Wisconsin Point and across the bay on Barker's Island; it is now a rare migrant.

Common breeding season observations include Mallard (nesting in woody uplands adjacent to cattail-sedge marsh), Herring Gull and Ring-billed Gull, Common Tern—infrequently nesting on a sandy peninsula on the bay side, Northern Flicker, Eastern Kingbird, Tree Swallow foraging over dunes and along the beach, Blue Jay, Common Crow, House Wren, Gray Catbird, Brown Thrasher, American Robin, Veery, European Starling, Red-eyed Vireo, Warbling Vireo, Yellow Warbler, American Redstart, Nashville Warbler in mixed white pine-white birch stands and red pine-white pine stand edges, Yellow-rumped Warbler, Brewer's Blackbird—nesting in common juniper, Clay-colored Sparrow in heath-like backdune and pine openings on the lake side, House Sparrow, Baltimore Oriole, Common Grackle, Brown-headed Cowbird, American Goldfinch, and Chipping Sparrow; and Alder Flycatcher, Yellow Warbler, American Redstart, and Common Yellowthroat in speckled alder and other shrubs along marsh edges.

Additionally, on 2 July 1996, during a collection of terrestrial invertebrates with BER zoologist Bill Smith, I observed a territorial Spot-

ted Sandpiper amidst *Hudsonia tomentosa* in heath-like backdune (Figure 23), and found the remains of an eggshell.

A pair of Merlins has nested recently in white pine stands at the western end of the point, with the male observed several times during midsummer flying over adjacent dunes or perched on the forest edge (Eric Epstein, *in litt.*). In early July 1996, I observed an adult foraging at the point's western end.

Perhaps the rarest summer bird sighting on Wisconsin Point was of a Kentucky Warbler, observed by Robbye Johnson during a breeding bird survey on 27 June 1989. Robbye's comment (*in litt.*): "This bird was obviously way out of range and has not been seen since."

In the adjacent marsh of Allouez Bay the following have been recorded during the breeding season: Common Loon, Double-crested Cormorant, Great Blue Heron, Common Snipe, Killdeer and Spotted Sandpiper (feeding along margins), Eastern Kingbird (feeding only), Red-winged Blackbird (nesting), Yellow-headed Blackbird (nesting), Black Tern (nesting in past years but absent as a breeding bird during recent surveys for the years 1994–1996), rarely Forster's Tern (no nesting recorded to date), Least Bittern, American Bittern, Mallard, Black Duck, Green-winged Teal, Blue-winged Teal (nesting), American Wigeon, Wood Duck, Canvasback, Virginia Rail (nesting), Sora (nesting), Tree Swallow, Barn Swallow (feeding only), Cliff Swallow (feeding only), Purple Martin (feeding only), Marsh Wren,

Figure 23. Heath-like backdune with a carpet of *Hudsonia tomentosa* at the west end of Wisconsin Point. (Photo by S.W. Matteson).

Sedge Wren, Common Grackle, Song Sparrow, and Swamp Sparrow.

Acknowledgments

I would like to thank the many volunteers whose breeding bird surveys contributed to this paper. They are (by site and years):

Lake Michigan—Ursula Petersen, Jackson Harbor Ridges, 1993–1995; Ken Lange, Kohler Dunes State Natural Area, 1980; Noel Cutright, Kohler Dunes State Natural Area, 1988, 1991–1995; Bill Smith and Robin Moran, Point Beach State Natural Area, 1978; Carol Rudy and Mike Grimm, Point Beach State Natural Area, 1984; John and Cindy Meyer, Point Beach State Natural Area, 1990; Sister Verna Osterhout, Point Beach State Natural Area, 1990–1995; Mike Mossman, Seagull Bar, 1983; Nancy Meyer, Seagull Bar, 1989–1990; William Tans and Robert Read, Whitefish Dunes State Park, 1976; and James J. Goodwin, Whitefish Dunes State Natural Area, 1987, 1988, 1990, 1991.

Lake Superior—Scott and Ann Swengel, Bark Bay Slough, 1989; Doug Beltman, Long, Stockton, Outer, and Michigan islands, 1988; Julie Van Stappen and Tom Doolittle, Long Island/Chequamegon Point, 1990–1995; Eric Epstein, Long Island, 1990, and Stockton Island Tombolo, 1994; David Bratley and Harold Mathiak, Wisconsin Point, 1970–1971; and Robbye Johnson, Wisconsin Point, 1976–1990.

Special acknowledgment is due Robbye Johnson for her lengthy service in conducting state breeding bird surveys on Wisconsin Point, and for contributing several noteworthy seasonal bird records from the Superior area during the past 2 decades.

Thanks to Mike Mossman, Eric Epstein, David Sample, and Sam Robbins for their extensive reviews and suggested manuscript changes; to June Dobberpuhl for her review of botanical portions of the paper; to Noel Cutright for his reviews of selected site descriptions; to Randy Hoffman for access to his files on state natural areas; to Fred Strand, Terry Daulton, Kim Bro, and National Park Service Staff (especially Robert Brander and Julie Van Stappen) for field and logistical assistance; and to Tom Erdman, Charles Sontag, and Eric Epstein for sharing their bird observations.

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50 Years Ago in *The Passenger Pigeon*

Society members usually leave WSO annual meetings with a feeling of appreciation for the successful meeting and for the hospitality of the people hosting the event. The 1946 convention in Appleton is described in this issue.

The convention had on exhibit the plaster plaque of the Passenger Pigeon monument made by Earl Wright. Two of the talks were devoted to the Pigeon. A.W. Schorger spoke on the "History of the Passenger Pigeon in Wisconsin" and Aldo Leopold titled his talk "The Passenger Pigeon as a symbol of conservation." B.L. von Jarchow described methods of providing sites for bush-nesting birds and there was a presentation on how garden clubs go birding. There were movies of the birds of New York and Wisconsin and Irven Buss described his experiences with Pacific birds and radar. B.J. Breckenridge showed his film "Fraternizing with Feathers" after the banquet.

One action by the Board was to raise life memberships to $50. (Excerpts from Volume 8, 1946)

Tree Sparrow *by Gerald H. Emmerich, Jr.*

Trumpeter Swan Release on the Bad River Reservation, Ashland County, Wisconsin

The author's essay relates the history of the Trumpeter Swan reintroduction program in Wisconsin, especially as it involves the Bad River Tribe of Chippewa and the Bad River Sloughs

by Phyllis Johnson

If you were a Trumpeter Swan inadvertently having come under the jurisdiction of the Wisconsin swan restoration program, where in Wisconsin would you like to be plunked down? Why, in a high quality wetland, of course. How about one with three wolf packs, five active Bald Eagle nests, a couple Merlin nests, and bears, bears, bears? You can afford to be picky since a fair amount of money has been spent in your restoration in Wisconsin, a state where Trumpeter Swans were never thought to be numerous. And results of restoration efforts would appear to be promising.

Would you prefer a heavily populated area? That way people could get a good look at you, beautiful you, on a regular basis. The people would like that, but you might not. Too many electrical wires around to kill you should you hit them. Too many hunters. Of course, they can't legally hunt you, but you never know if they might mistake you for another bird.

Of course, Trumpeter Swans can't think. At least we have no evidence that they can think in the same way that humans can. As far as we know, they only have innate behavior for a guide in how to make it in the swan world. And that is one of the things that will, as a matter of course, be put to the test, in a way, during this restoration program. Will innate behavior be enough?

In fact, parental influence and learned behaviors have been minimized as well. In the early days of the restoration efforts which started in 1987, one of the plans which was tested gave the swans "parents" in the form of mute swans. That didn't work any better for Trumpeter Swans than it did when surrogate Sandhill Crane parents were provided for Whooping Cranes young. The endangered whoopers just couldn't identify other whoopers when it came time to mate. In fact, they were misfits.

One actual mating between a sandhill and a whooper produced a crane baby which was quickly steril-

ized by the Audubon Society, the group in charge of this experimental program. This bird can be seen yet at Bosque del Apache Wildlife Refuge in New Mexico. The wildlife experts at Bosque del Apache refuge don't really like to talk about it.

In the case of the Mute Swan parents for trumpeter babies, the Mute Swans apparently expected that the cygnets would climb onto the parents' backs when turtles came looking for a meal. However, trumpeter cygnets apparently don't have that response among their defense mechanisms and the turtles enjoyed an easy feast.

Cross fostering of Trumpeter Swan eggs under feral Mute Swan parents as a method of reproducing the species was quickly abandoned by the biologists in the Wisconsin restoration efforts. The method chosen was to use decoy rearing with eggs from both Alaska and avicultural sources. But will decoy rearing provide the trumpeter babies with enough smarts to survive in a world which already has taken their species numbers to a dangerously low level?

Decoy rearing of a species was pioneered by the International Crane Foundation at Baraboo, Wisconsin. However, they were not chosen to run the program of the Whooping Crane restoration years ago. When the cross fostering program faltered, the International Crane Foundation began serious efforts to restore a migratory Whooping Crane flock via decoy rearing.

Wisconsin's Trumpeter Swan restoration efforts are under the direction of Sumner Matteson of the Bureau of Endangered Resources at the Wisconsin Department of Natural Resources. Active in the program is the Bureau of Research of the Wisconsin DNR via the efforts of Michael Mossman and Lisa Hartman.

They chose the high quality wetlands available in the Bad River Indian Reservation which fronts on Lake Superior east of Ashland, Wisconsin, for the most recent segment of the Wisconsin effort to establish Trumpeter Swans in the state. The Bad River Natural Resources Department is located at Odana, Wisconsin.

Trumpeter Swan eggs were collected from the Minto Flats in east central Alaska by the Wisconsin DNR in cooperation with the United States Fish and Wildlife Service in June of 1995. The eggs were flown to Wisconsin and placed in incubators at the Milwaukee County Zoo. The swans were moved to brooders with a nearby loafing area, a ramp and swimming pool. Their attendants wore camouflaged costumes. At the age of three weeks, the swans were moved to an area near Pewaukee, Wisconsin, where a series of outdoor pens located on the edge of a larger fenced pond were provided for the use of the swans. Recordings of Trumpeter Swan vocalizations were used throughout the process.

Wildlife biologist of the Bad River Natural Resources Department, Tom Doolittle, who heads the introduction of the swans for the band of Lake Superior Chippewas, said that he can discover no evidence that Trumpeter Swans ever inhabited the sloughs, rivers, or coastal waters of the Bad River Reservation. The goal of the Wisconsin "restoration" program is to establish a breeding and migratory flock of at least 20 pairs of trumpeters by the year 2000. These

20 pairs will be part of a flock of at least 50 pairs.

An extensive discussion of the statewide effort was published in the *Bird Watcher's Digest* of November/December, 1996. Author Robert J. Zimmer declared the Wisconsin effort "wildly successful." Zimmer said, "The highlight of the 1995 season was the first state nesting of a completely wild-produced pair of swans (previous nesting records were all from released birds). Two of the pair's four eggs hatched, and one cygnet has survived."

Tom Doolittle isn't concerned with competing with that record. He is interested in the survival of as many as possible of the 14 Trumpeter Swans which were released in the Bad River Slough on May 13, 1996. He details the loss of three swans in his preliminary report to the United States Fish and Wildlife Service and the Bureau of Indian Affairs on September 18, 1996. Swan 64T, a solitary female, was found dead August 1, 1996, on the big round river section of the Kakagon river. She had been originally released on Wood Creek slough. She had been radio collared before release. The mortality signal led staff to the kill location. Large bite marks spaced 10cm apart on her neck, bear scat, and large broken branches led staff to conclude that the swan had roosted during a rainy period on a bear trail. She had been consumed by a bear, but whether the bear actually killed the swan is up to conjecture, said Doolittle.

On September 18, 1996, Tribal biological aides found two dead Trumpeter Swans, 67T and 66T in Sand Cut slough. Swan 67T was almost completely scavenged; however, swan 66T was almost entirely intact. The second swan, 66T, had not been dead likely for more than five days. Swan 67T, found in a far back channel of Sand Cut slough and died in a middle of a large grassy area with no apparent signs of a struggle. Swan 66T died in hide cover underneath a log and brush. These two swans were males being attended by females and both carcasses were vigorously defended by their surviving mates. Both dead swans were sent to the WDNR Wildlife Health Laboratory in Madison, Wisconsin, where necropsies are being conducted to determine cause of death.

Therefore, at present (November 1, 1996) eleven of the original 14 swans are living. The swans include four pairs that have set up strong pair bonds and are defending territories. These pairs are located at Moonshine Lake, an un-named beaver pond east of Moonshine Lake, Rins Flowage, and Sand Cut Slough. The remaining three swans are females.

When the swans arrived for introduction at the age of 23 months, they had been paired based on the observations of their care takers. They were introduced as pairs in preplanned locations. However, two of the paired males which had been selected for introduction tested positive for having been exposed to avian influenza and Newcastle's disease. These males have since been retested with negative results. However, they were not released with the other swans. After testing negative, they were released in Polk county.

The two females with which they had been paired were released together. One of these two females was

Figure 1. May 13, 1996.—Tom Doolittle sorts birds marked for correct placement. Maureen Gallagher, who helped with the Trumpeter introduction, is watching. *Photo by Phyllis Johnson.*

the first to die, the apparent casualty of the bear. The two males which have died left their mates. So the three surviving females are without mates.

Of the eleven swans remaining, I am most interested in the pair introduced into Rins slough, 73T, a female, and 12T, a male. I have named them Kerry and Peter after Kerry Kindt, Ashland Fish and Wildlife Service, and Peter David, Great Lakes Indian Fish and Wildlife Service, who took me along in the boat when they took the birds to Rins slough for release. When the swans were placed in the sloughs at Bad River, they were kept in pairs and placed in different sloughs, all part of a carefully pre-arranged plan. Wings were clipped so that the swans couldn't fly until mid or late August. The only means of transportation for the swans was swimming or walking. So, swim and walk they did.

Kerry and Peter, at this writing, are still in their isolated Rins slough. They can fly now, but haven't yet joined the others. This pair with a stay-at-home inclination is not typical of the rest of the swans. The rest of the swans were quite mobile. And then, too, the Bad River area was inundated with a flood about the fourth of July making it easier for the swans with clipped flight feathers to move about.

As of June, the swans had selected a social arrangement which included one group of six, one group of three, Kerry and Peter, and several singles. The group of six were quite mobile, having been observed by Doolittle early in the day at one location and late in the day at a spot eight miles away. And they weren't flying yet! They were found anywhere from the north end of Long Island in Lake Superior to the south end of Honest John slough, a distance spanning 14

Figure 2. May 13, 1996.—Kerry Kindt takes pictures of 73T (female) as she leaves her transport carrier. *Photo by Phyllis Johnson.*

miles. However, by September, there were only four pairs and three lonely females.

Will these decoy-raised Trumpeter Swans migrate? That's the question I asked Tom Doolittle. The coming winter will be their third winter. Tom said these released birds will respond to the environmental stresses of cold and the shortage of food rather than an innate imperative behavior. Will they migrate together as pairs, as a group? Will the singles stay together? Will they find new mates during their migration? Will the pairs return to the territories they have been defending?

Doolittle will be able to monitor the migration. The Bad River Tribe has purchased 10 transmitters, a receiver, yagi antenna, an aircraft switch box, and two fixed antennae for mounting on a small aircraft. This equipment was invaluable in locating the swans on the large reservation during the summer and locating the mortalities. One transmitter failed during the summer. Others have worked flawlessly. The transmitters are mounted to the green identification collars which have been coated with a silicon base to avoid ice buildup. The work plan for migration, according to Doolittle, is to monitor the swans until they migrate, and then attempt to follow radio-collared swans 69T, 59T, 61T, 72T, and 65T southward on their migration. Swans 69T and 59T are a mated pair. The other three to be followed are the three lone females with no local options. Biologists will note stop-over points and hope to locate wintering grounds.

By December 31, 1996, Tom hopes to have analyzed additional behavioral data and submitted it for peer review. Behavior observations were conducted from a float tube covered with synthetic and natural camouflage material to mimic a muskrat house. In late April, 1997, he will initiate a series of fly overs to locate any swans on the Bad River Reservation that may have returned. That is, if they return. Then we will know if Trumpeter Swans can be raised by decoy puppets as well as by parents! Will the three lonely females locate mates? Hey, Tom! Who's watching Kerry and Peter?

Doolittle reports that he has heard the trumpeting of swans in the greater Kakagon/Bad River Slough complex. He also reports that the Trumpeter Swan release has been embraced by the Bad River tribal community. The word for swan in Anishinabe is wabizzi. The wabizzi has an important place in Chippewa culture. Parts of the dead swans have been saved to give to female members of the tribe. The swan dance is a traditional dance performed by the females of the tribe. This year for the first time in centuries, some dancers will be wearing swan feathers in the traditional ceremony.

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The Spring Season: 1996

by Laura L. Erickson

The spring of 1996 will long be remembered, as Joe Hudick succinctly put it, as "the coldest, most dismal spring in anyone's recent memory." Following the severe winter, lakes stayed frozen much longer than usual, which frustrated birders because of the delayed migration yet in the end held birds longer for us to enjoy. Alta Goff, in Barron, had three species of warblers coming to her bird feeders, probably due to the cold, and Kay Burcar, in Dane, noted that warblers remained much later than normal, many into June. Tom Worley said lilacs didn't start blooming in Dane until 19 May, although he noted that according to Robbins the normal date is 10 May. The ice on Bob Green's lake in Vilas didn't go out until 16 May—the latest previous date of ice-out in the 26 years he's lived there was 2 May. Dick Verch said that the Lake Superior bay in Ashland remained frozen until mid–May. Murray Berner noted that in Portage, "Crows preceded ravens out of the nest this year. Unusual." Sam Robbins called it "one of the most backward springs I can remember . . . Especially noticeable was the lack of song among the May migrants. I could see passerines moving in upper tree branches (because foliage was slow in developing), but would hear no songs or call notes. A 'silent spring'!"

Philip Ashman, in Dane, described the season in its entirety:

> The waterfowl migration started out very impressively for me in mid- to late–February . . . However, the good migration did not carry over into March because the weather turned quite a bit colder during the month and many ponds and lakes remained ice-covered until the end of the month. The Madison lakes did not totally open up until early April. When open water finally was available, not many ducks were seen—I didn't see any large numbers of individuals like the last two years. I suspect that a lot of waterfowl overflew the area because of the lateness of the ice breakup—though I can't figure out where they went because all the water was frozen to the north as well . . .
>
> April was cold and dreary for the most part and was very slow for landbird migration, with low numbers

found of many of the normal April migrants, for example: Yellow-bellied Sapsucker, Eastern Phoebe, swallows, Winter Wren, and Golden-crowned Kinglet. I only saw 5 species of warblers by the end of the month. May started out the same way with cold weather for the first week. The main wave of migrants, especially warblers, started on 9 May and, surprisingly, a steady movement of birds continued right through the Memorial Day weekend. In general, however, many species seemed to be a week or so later than normal as the cold weather persisted almost through the month.

The effects of the cold spring were varied, some good and some bad. Two good results were: the foliage on the trees did not develop so that by the time migration was in full swing viewing conditions were excellent; and birds seemed to be found foraging much lower than normal, oftentimes right on the ground. The bad results were: I had to bundle up with a hat, gloves, long underwear, and 4–5 layers of upper garments for almost every morning of the migration; and there was very little song coming from the birds—cold, gray mornings must not be very conducive to singing. For example, on 14 May I found 24 species of warblers at the Arboretum and Picnic Point—only 11 of these sang and for a few only one or two songs were heard. Another result of the cold spring was that a number of species that normally head north with the onset of warm weather lingered much later than normal—I had record late departure dates (for me) for Yellow-bellied Sapsucker, Brown Creeper, Golden -crowned Kinglet, American Tree Sparrow, and Purple Finch, and near records for Dark-eyed Junco and Pine Siskin. Pine Siskins lingered in good numbers into May and I suspected nesting in at least two instances.

Ellen Hansen described migration as "both wonderful and terrible." Despite the dismal beginning, once migration finally kicked in, it was impressive. In Sheboygan, David and Margaret Brasser found 9 May "a tremendous day! In two hours (5:30–7:30 P.M.) at North Point we saw incredible numbers of thrushes, warblers, and sparrows . . . and a tree full of Bobolinks! A LeConte's Sparrow (a lifer!) was walking in and out of the wet grass on the edge of the road by the North Point parking lot." That same day, Mark Korducki, in Milwaukee, found 24 species of warblers, his best thrush day in years, and found good numbers of grosbeaks, orioles, and tanagers.

Korducki noted that "Due to the cold weather and lack of leaf-out, the migrants spent a good deal of time on the ground. This made for some incredible and unforgettable viewing as lake front golf courses and soccer fields were littered with birds like a Gulf Coast fallout." Although these conditions are wonderful for birders, Korducki noted the sad implications for birds: "The Chicago hotline reported many birds killed by cars or starving to death. One Kenosha County birder reported hundreds of passerines washed up on shore, possibly casualties of a heavy fog. I received several reports of warblers feeding at suet and hummingbird feeders."

Daryl Tessen said, "Winter dragged on and on—like six months of it–ugh! The weekend of May 17–19, the weather broke and the 'bird dam' broke. Temperatures suddenly soared into the 80s, from the 50s. Instant leaves, and birds all over. The early migrants, in big numbers, were

joined by the mid-and late–May migrants. Quite a show."

Janine Polk had much the same experience in the Eau Claire area: "Songbird migration was much delayed, following the late appearance of leaves and insects. The North American Migration Count on 11 May seemed more like a day in April, with lingering waterfowl and few migrant songbirds; a week later the high was 86 and trees were fully leafed out, and it seemed as though we'd skipped directly into summer."

An incredible number of northern owls from the winter's invasion lingered in Wisconsin through the spring, and these and other rarities apparently inspired many people to submit at least one rare bird documentation. Although coverage of most counties was spotty at best, a total of 99 observers sent in seasonal reports and/or details of rarities. Coverage included reports of 313 species in 64 counties.

Many thanks to all the people who filed reports this season, especially those who put their names on everything, were legible, and remembered to list the county under location. I especially appreciate the many helpful comments about weather and the migration, and wish there were enough space to include more of these comments in their entirety.

I would also like to thank my husband and children for their tolerance as I worked on this report in the aftermath of our autumn house fire, and my good friend Chris, who kept me awake as the deadline loomed. I'd also like to thank Becky Isenring for her extraordinary patience in waiting for a very belated report.

Reports (1 March–31 May 1996)

Red-throated Loon.—Observed by several observers, all in Manitowoc, between 10 April (Regan) and 4 May (Tessen).

Common Loon.—Sightings in mostly normal numbers, except below normal or absent in Lake Michigan counties; recorded in 30 counties throughout beginning 1 April in Polk (Hudick). Seen through EOP in northern counties and south to Polk and Monroe, where Kuecherer reports nests found during each of the past 10 years.

Pied-billed Grebe.—Reports from 41 counties in normal numbers. First reports 1 March in Oneida (Bowman) and 8 March in Washburn (Cahow). Ashman counted 72 in Dane on 16 April; the LaValleys counted 138 in Douglas on 25 April; and Ziebell counted 70 in Winnebago on 11 May. Reported through end of the season throughout.

Horned Grebe.—Reports from 26 counties throughout, in mixed numbers. Polk found one late February arrival in Eau Claire; next reports beginning 22 March in Milwaukee (Diehl). On 25 April, the LaValleys counted 117 in Douglas. Reported until 18 May in Outagamie (Mead) and 19 May in Dodge (Jeff Baughman).

Red-necked Grebe.—Reports from 13 scattered counties beginning 13 April in Marathon (Belter). On 20 April, Johnson counted 100 in Douglas. Reports through end of the season in Burnett, Green Lake, and Winnebago.

Eared Grebe.—All reports: 22 April in Ozaukee (Tessen); 23 April in Dane (Robbins); 18–30 May in Dane (m.ob.); 5- 7 May in Columbia (Ashman and Burcar); and 11 May in Green Lake (Tessen).

Western Grebe.—Reported 18 May in Green Lake (Wood) and 21 May in Burnett (Hoefler).

American White Pelican.—Reports from 15 counties throughout in normal and above normal numbers, beginning 14 April in LaCrosse (Dankert and Lesher), and remaining through the end of the season in Brown,

Douglas and Door. The LaValleys counted 36 birds in Douglas on 25 April. Carlsen counted another 36 in Pierce on 2 May, and noted that they were so numerous in that part of the state that newspapers were printing photographs.

Double-crested Cormorant.—Reports from 34 counties throughout, in mostly normal numbers, beginning 16 March in Winnebago (Tessen), and remaining through the end of the season in 12 counties. Many reports of flocks numbering over 200 and 300. On 22 April, Polk counted 500–600 in Chippewa; on 25 April, Tessen counted 1000+ in Brown, and on 4 May, Sontag counted 1250 in Manitowoc.

American Bittern.—Reports from 17 counties in normal and below normal numbers, beginning 8 April in Ozaukee (Uttech), and remaining through the end of the season in 8 counties south to Dodge. Ziebell counted 4 in Winnebago on 11 May.

Least Bittern.—All reports: Columbia 11 May (Tessen); Winnebago 11 May through EOP (Ziebell); Ozaukee 18–19 May (Frank and Diehl); Milwaukee 19 May (Domagalski); Green Lake 21 May through EOP (Schultz); Lafayette 24 May through EOP (McDaniel); Door 31 May (Stover).

Great Blue Heron.—Reports in mostly normal numbers from 46 counties throughout beginning 1 March in Dane (Ashman) and Washburn (!) (Cahow). On 11 April, Gustafson counted 49 in Ozaukee. On 11 May, Belter counted 73 in Marathon, where Williams reports a heronry on Lake Wausau. Remained through EOP throughout.

Great Egret.—Reports of mixed numbers from 29 counties beginning 11 April in Dodge (Tessen) and Ozaukee (Gustafson). In Dodge, Frank counted 30 on 19 May and Worley counted 23 on 25 May. Reports through the end of the season north to Douglas, Marinette, Menominee, and Oconto.

Snowy Egret.—Reports from 5 counties: Ozaukee on several dates between 11 April (Frank and Uttech) and 23 May (Bontly); Milwaukee 21 April (Peterson) and 11 May (Gustafson); Dodge 22 April through 19 May (m.ob.); Brown 3 May (Mead) through EOP (Hansen); Dunn 20 April–6 May (R. Hansen); and Marathon 9 May (Belter and Tamminen).

Little Blue Heron.—All reports: 19 April in Chippewa (Polk reported 2 birds); 25 April in Brown (Tessen); 26 April in Milwaukee (Domagalski); 28 April in Ozaukee (Uttech).

Cattle Egret.—Several reports from Brown County between 29 April (when Tessen found 9) through the end of the season (Hansen); other reports from 18 May in Manitowoc (Sontag) and Milwaukee (Frank, Gustafson), and 19 May in Ozaukee (Frank) and Fond du Lac (Tessen).

Green Heron.—Reported in normal and some below normal numbers from 32 counties throughout beginning 19 April in Brown, Dane, Milwaukee, and Washington (m.ob.). Remained through the end of the season in 19 counties throughout.

Black-crowned Night-Heron.—Reports in below normal numbers from 9 scattered counties north to Oconto (the Smiths) between 29 March in Winnebago (Tessen) and the end of the season in Dodge, Door, Manitowoc, Milwaukee. On 13 April Tessen counted 12 in Winnebago and on 21 May Diehl counted 12 in Milwaukee.

Yellow-crowned Night-Heron.—Reports from Racine 2–4 May (Peterson, Tessen). Several observers reported in Milwaukee 3–17 May. Korducki saw 2, including an adult, on 10 May.

Plegadis sp. Ibis.—Reports from 11 May in Milwaukee (Gustafson) and 19 May in Door (Regan) were accepted by the Records Committee.

Tundra Swan.—Reports from 28 counties in mostly normal and below normal numbers, beginning 14 March in Green Lake (Schultz). Several reports of flocks numbering 400 were found from 2–16 April. On 15 April, Tessen counted 1500+ in Outagamie; on 16 April he still found over 1000 there; on 16 April Berner also counted over 1000 in Portage. Late individuals reported 26 May in Racine (DeBoer), 27 May in Oconto (the Smiths) and 29 May in Outagamie (Tessen).

Figure 1. Snowy Egret, Dodge County. *Photo by Bartholmai.*

Trumpeter Swan.—Hoefler reported throughout the season in Burnett. Elsewhere reported between 26 March in Polk (Hudick) and 26 May in Vilas (Jim Baughman), including reports from Ozaukee, Juneau, Marathon, Outagamie, Columbia, and Jackson.

Mute Swan.—Reports in normal and above normal numbers throughout the season in Ashland, Door, Portage, and Dane. The Lukes counted 8 in Door on 2 March, and Peterson counted 18 (!) in Shawano on 19 April. Additional reports from Bayfield, Douglas, Oconto, Ozaukee, Sheboygan, Dodge, Washington, and Waukesha.

Greater White-fronted Goose.—Reported between 9 March in Ozaukee (Uttech and Green) and 27 April in Monroe (when Kuecherer saw 16). On 28 March, Tessen counted 22 in Winnebago, and on 14 April Korducki counted 51 in Dodge. Additional reports from Columbia and Dane.

Snow Goose.—Reports in below normal numbers from 14 scattered counties between 3 March in Waukesha (Strelka) and Winnebago (Nussbaum) through 10 May in Pierce (Carlsen) and the end of the season in Monroe (Kuecherer). Flocks numbering in the 20's were noted in Price, Walworth and Shawano.

Ross's Goose.—Reports accepted by the Records Committee from Dodge 24 March to 14 April (T. Wood, Domagalski, and Korducki) and Columbia 31 March to 8 April (Schultz, Peterson, Robbins, and Gustafson).

Canada Goose.—Reported from throughout the state throughout the season in mostly normal and above normal numbers. The Kuhn family reports 100 goslings by 12 May in Sheboygan, but the Lukes found poor reproductive success in Door. Largest counts were of 1600 in Winnebago 21 April (Ziebell), 5000+ in Outagamie 27 March (Tessen), and 8000 in Outagamie 15 April (Tessen).

Wood Duck.—Reports in mostly normal numbers from 46 counties throughout the state beginning 1 March in Portage (Berner). On 13 April Belter counted over 50 in Marathon. Remained through the end of the season throughout.

Green-winged Teal.—Reports from 36 counties beginning 15 March in Winnebago (Tessen). On 13 April, Belter counted over 200 in Marathon; on 25 April, Ashman counted 175 in Dane. Reported through the end of the season in six scattered counties.

American Black Duck.—Reports in normal and below normal numbers from 28 counties throughout, throughout the season. Robbins counted 50 in Dane on 9 April.

Mallard.—Reports from 48 counties in normal numbers throughout the season. Ziebell counted 800 in Winnebago on 27 March. Diehl reports a Mallard × Northern Pintail hybrid on 8 April in Washington.

Northern Pintail.—Reports in normal and below normal numbers from 24 counties from the beginning of the season in Winnebago (Nussbaum) and 17 March in Brown (J. Hansen) and Trempealeau (Lesher) through 27 May in Dodge (Domagalski).

Blue-winged Teal.—Reports from 46 counties in mostly normal numbers beginning 11 March in Ozaukee (Diehl) and remaining through EOP throughout. Hilsenhoff counted 131 in Dane on 15 April, Ashman counted 120 in Dane on 21 April, and Belter counted 120+ in Marathon on 11 May.

Cinnamon Teal.—Belter found one in Marathon on 4 May.

Northern Shoveler.—Reports from 37 counties throughout in mostly normal numbers, from the beginning of the season in Dane (Ashman) and through the end of the season in 11 counties throughout. Ashman counted 220 in Dane on 19 April.

Gadwall.—Reports from 28 counties throughout in normal numbers, from the BOP in Dane, Winnebago, and Polk, and remaining through EOP in 8 scattered counties. On 5 April, Ashman counted 25 in Dane.

Eurasian Wigeon.—Reports from Outagamie from 15–21 April (m.ob.) and Racine 25 April (DeBoer)

American Wigeon.—Reports in normal and below normal numbers from 39 counties throughout from the beginning of the season in Dane (Ashman) and remaining through EOP in 6 counties. Hilsenhoff counted 130 in Dane on 5 April.

Canvasback.—Reports in mostly normal numbers from 25 counties, from BOP in Dane (Ashman) and remaining through 25 May in Winnebago (Bruce) and Dane (Robbins), and EOP in Dodge (m.ob.) Hale counted 380+ in Jefferson on 2 April.

Redhead.—Reports in mostly normal numbers from 29 counties from the BOP in Dane (Ashman) and Milwaukee (Bontly), through the EOP in 6 scattered counties. Sontag counted 125 in Manitowoc on 22 April.

Ring-necked Duck.—Reports from 39 counties in normal numbers from the BOP in Dane (Ashman) and Winnebago (Tessen), remaining through EOP in 8 scattered counties. Ashman counted 200 in Dane on 7 April; Belter counted 210 in Marathon on 4 May.

Greater Scaup.—Reports from 21 scattered counties in mostly normal numbers; at the BOP in 4 Lake Michigan counties and Winnebago (Tessen), and remaining through the EOP in Manitowoc and Milwaukee. The Smiths counted 1000 in Oconto on 19 April; Zehner counted 1000 in Milwaukee on 22 April.

Lesser Scaup.—Reports from Lake Michigan counties, Winnebago, and Dane from BOP. Reported in 35 counties throughout, and found through EOP in 8 counties. Hale counted 900+ in Jefferson on 31 March.

Scaup sp..—On 4 March Diehl counted 2000 in Milwaukee. Ziebell counted 800 in Winnebago on 4 April.

Harlequin Duck.—Only report from Manitowoc on 3 April (Sontag and Tessen).

Oldsquaw.—Found from the BOP in Door, Milwaukee, Ozaukee, and Sheboygan. Ashman found two males in Dane on 15 April, and the Smiths located one in Oconto on 19 May. Last report in Door on 23 May (Lukes).

Black Scoter.—Reports from Milwaukee and Ozaukee between 10 March (Bontly and

Tessen) and 19 May (Diehl and Frank). Also reported from Washington on 3 May (Domagalski). Notably absent from Ashland, Bayfield, and Sheboygan.

Surf Scoter.—First reported in Sheboygan 16 April (Jeff Baughman); last report from Ozaukee 24 May (Domagalski). Additional reports from Milwaukee and also LaCrosse, 16 May (Dankert).

White-winged Scoter.—Reported 11–22 April in Ozaukee (Frank, Peterson, Tessen) and 16 April in Sheboygan, where Jeff Baughman counted 35.

Common Goldeneye.—Reported from 32 counties in mostly normal numbers, from the BOP in 11 counties throughout north to Door, and through EOP in Door and Douglas. Ziebell counted 200 in Winnebago on 4 April; Belter counted 230+ in Marathon on 7 April. The Lukes report adults with young at the end of the season in Door.

Bufflehead.—Reported in 5 Lake Michigan counties and Dane from BOP. Remained through EOP in Ashland, Barron, Bayfield, Washburn, Door, and Dane (Burcar). Reported from a total of 38 counties in normal numbers. Verch counted 73 in Ashland/Bayfield on 17 May, and Belter counted 70+ in Marathon on 26 April.

Hooded Merganser.—Reports of normal numbers from 40 counties throughout, from BOP in Brown, Ozaukee, Winnebago, and Dane, and through EOP in 11 counties south to Dane. Belter counted 180+ in Marathon on 7 April.

Common Merganser.—Reports of normal numbers from 36 counties throughout, from BOP in 9 counties north to Door. Remained through EOP in Bayfield, Douglas, and Vilas. Belter counted 200+ in Marathon on 7 April.

Red-breasted Merganser.—Reports from BOP in 5 Lake Michigan counties. Reported in normal numbers from 30 counties in all, through EOP in 7 counties south to Milwaukee. Sontag counted 439 in Manitowoc on 1 May, and Verch counted 200+ in Ashland/Bayfield on 16 May.

Ruddy Duck.—Reports in mostly normal numbers from 24 counties north to Ashland/Bayfield (Bratley, Verch) and Oconto (Smiths) beginning 11 March in Ozaukee (Green) and Winnebago (Tessen). Regan noted a "strange fallout" in Kewaunee on 15 April, when he counted 250+. There were "none seen the day before, only a few the day after." On that same day, 15 April, Sontag counted 363 in Manitowoc. Remained through EOP in five counties north to Winnebago.

Turkey Vulture.—Reports of normal numbers from 46 counties throughout, beginning 18 March in Walworth (Parsons), and remaining in 27 counties through EOP. The LaValleys counted 66 in Douglas on 13 April, and Jeff Baughman counted 80 in Fond du Lac on 16 April.

Osprey.—Reports of normal and above normal numbers in 34 counties throughout beginning 6 April in Wood (Stout). Belter counted 11 in Marathon on 11 May.

Bald Eagle.—Reports of normal and below normal numbers from 32 counties throughout the season. Schultz reports 2 active nests in Green Lake.

Northern Harrier.—Reports from the BOP in Fond du Lac, Ozaukee, Sheboygan, and Winnebago. Found in 41 counties throughout in mostly normal numbers. Belter counted 7 in Marathon on 11 May. Reported through EOP in 22 counties.

Sharp-shinned Hawk.—Reports from 38 counties in normal and below normal numbers—from BOP in 5 counties north to Door and Burnett, through EOP in 13 counties. Frank counted 11 in Ozaukee on 2 May.

Cooper's Hawk.—Reports of normal numbers from 39 counties throughout the season.

Northern Goshawk.—Reports of below normal numbers from Ashland, Bayfield, Door, and Douglas throughout the season. First report south of there was 8 March in Outagamie (Tessen). Also reported in Vilas, Marathon, Portage, and Dane. Notably missing from Milwaukee and Oconto.

Red-shouldered Hawk.—Reported from BOP in Dane and Outagamie. Reports in a total of 25 counties in normal and below normal numbers, north to Ashland, Bayfield, Menomenee, Oconto, Oneida, and Vilas. Berner counted 5 in Portage on 21 May.

Broad-winged Hawk.—First reported 30 March in Green (Link) and 2 April in Barron (Goff). Reports of mostly normal numbers from 38 counties throughout. Hansen counted 50 in Dane on 18 April. Remained through the EOP except in the southern counties.

Swainson's Hawk.—One carefully documented 14 April sighting in Iron (Elias).

Red-tailed Hawk.—Reports of mostly normal numbers from 47 counties. Diehl reports a partial albino throughout the season in Milwaukee, which mated with a normally-pigmented red-tail.

Rough-legged Hawk.—Reports of normal and below normal numbers from BOP in 30 scattered counties, with one still lingering 28–29 May in Winnebago (Tessen). Decker counted 40 in Clark on 14 April.

Golden Eagle.—All reports: Winnebago 1 March (Tessen); Jackson 16 March (Otto); and Burnett 3 April (Hoefler).

American Kestrel.—Reports of mostly normal numbers throughout the season from 44 counties. Frank found 19 in Ozaukee on 2 May.

Merlin.—Reports of normal and above normal numbers (though hard to find in Sheboygan) from 19 counties, beginning 16 March in Milwaukee (Korducki). Remained through EOP in Ashland, Bayfield, Douglas, and Vilas.

Peregrine Falcon.—Reported in mostly normal and above normal numbers from 15 counties beginning BOP in Brown and Milwaukee (m.ob.). Reported through EOP in Brown, Milwaukee, and Dane.

Gyrfalcon.—Three reports from Brown: 23 March (Ty Baughmann), 25 March (LaPlant), and 26 April (Reed).

Gray Partridge.—All reports: TTP in Door (Lukes); 2 in Kewaunee on 12 March (Regan); and in Green 31 March (Link).

Ring-necked Pheasant.—Reports of mixed numbers from 33 counties throughout, north to Ashland and Bayfield, throughout the season. The LaValleys found 7 in Douglas on 9 March.

Spruce Grouse.—Jim Baughman found a male and female in Vilas on 11 May, and Wood found another in Vilas on 31 May. Wood also found an adult male in Oneida on 29 May.

Ruffed Grouse.—Reports in normal and below normal numbers from throughout the season in 34 counties.

Greater Prairie-Chicken.—Reported from throughout the season in Clark (Decker). In Marathon: Williams, Belter, and Ott found between 18 March and 13 April (largest number was 10); in Wood, Hanson reported on 20 April; in Portage Berner and Dankert report at least 20 between 14 April and 27 May.

Sharp-tailed Grouse.—Through the season in Ashland/Bayfield (Verch), Burnett (Hoefler) and Douglas (R. Johnson and the LaValleys, who counted 13 on 1 May).

Wild Turkey.—Reports in mostly normal and above normal numbers from 35 counties north to Oconto (Smiths). Duerksen counted 54 in Richland on 9 March, and Parsons counted 60 in Walworth on 8 April.

Northern Bobwhite.—Reported TTP in Richland. Otherwise first reported 13 April in Dane (Ashman). Other reports from Grant, Columbia, Iowa, Sauk, and even north to Green Lake (Schultz). Duerksen in Richland had coveys of 12–14 birds coming to her feeders until early April.

Yellow Rail.—First reported 11 May in Shawano (Peterson) and Oconto (J. Hansen) 5–6 individuals in Marquette 19 May (Tessen, Jeff Baughman, Schultz); 5 individuals in Green Lake 19 May (Tessen) and 8 individuals in Vilas 26 May (Baughmans).

King Rail.—First reported in Ozaukee 9–16 April (Uttech). Additional reports from Fond du Lac, Columbia, Dodge, Winnebago, and Dane, through 23 May, when Tessen and Peterson found 4 in Winnebago.

Virginia Rail.—First report 7 April in Ozaukee (Uttech). Reports in normal and below normal numbers through the end of the season from 20 counties north to Ashland, Bayfield, and Vilas.

Sora.—First reported 17 April in Brown (J. Hansen). Additional reports, of mostly normal numbers, from 20 counties through EOP. On 11 May, Ziebell counted 34 in Winnebago.

Common Moorhen.—First reported 10 March in Ozaukee, where Tessen found 5. Another early record in LaCrosse on 14 March (Lesher). Reported in normal to below normal numbers from 9 scattered counties north to Oconto (Smiths), through EOP.

American Coot.—Reports throughout the season from 41 counties in normal numbers. On 15 April, Ashman counted 3000 in Dane, where Hilsenhoff counted 1500 on 17 April. Domagalski counted 1700 in Washington on 20 April.

Sandhill Crane.—First reports 3 March in Ozaukee (Uttech) and 5 March in Walworth (Parsons). Reported in normal and above normal numbers from 45 counties through the end of the season. On 14 March, Parsons counted 175 in Walworth; on 16 March, Hale counted 298 in Jefferson in a half-hour period in mid-afternoon, all flying north, high over her house; and on 22 March, Tessen counted 110 in Waushara.

Black-bellied Plover.—Reports between 2 May in Milwaukee (Gustafson) and EOP in Portage (Berner). Reported from 14 scattered counties (none of the western counties) in low numbers, and notably absent for several Lake Michigan and Oconto observers.

American Golden Plover.—First reports 20 April in Dodge (Gustafson) and 24 April in Dane (Burcar). Also reported from Ozaukee. Last report on 17 May in Outagamie, where Tessen counted 12.

Semipalmated Plover.—First report 21 April in Dane (Ashman). Reported from 15 scattered counties (none in the western tier) in mostly below normal numbers, through the EOP in Ashland/Bayfield and Dane. On 23 May, Ashman counted 20 in Dane.

Piping Plover.—All reports: 30 April on Bradford Beach in Milwaukee (Gustafson); 2 May in Manitowoc (Peterson); 9 May in Ashland (Radloff), 15–16 May in Bayfield (Verch). Verch counted 2 on 16 May.

Killdeer.—First reported 11 March in Milwaukee (Korducki). Reported in normal and below normal numbers in 49 counties, many through EOP. Belter counted 20+ in Marathon on 9 April.

Black-necked Stilt.—Reports from 19 May in Fond du Lac (Schultz and Tessen) and 31 May in Waukesha (Strelka) accepted by the Records Committee. Boldt saw 2 at Horicon Marsh in Dodge on 23 May, which were also present on 22 May.

American Avocet.—All reports: 4 May in Milwaukee (Domagalski counted 48) and Manitowoc (Tessen counted 7); 5–10 May in Price (Hardy); 8 May in Bayfield (Verch, Bratley); 17 May in Washington (Domagalski); and 17 May through EOP in Manitowoc (Sontag).

Greater Yellowlegs.—First report 1 April in Milwaukee (Korducki). Reported in mostly below normal numbers from 30 counties throughout. On 4 May, Tessen counted 30 in Outagamie. Reported through the EOP in Ashland/Bayfield (Verch) and Vilas (Dring).

Lesser Yellowlegs.—First report 23 March in Dane (Evanson). Reports in mostly below normal numbers from 33 counties throughout; through EOP in Dane. In Outagamie, Tessen counted 175 on 28 April and 150+ on 9–10 May.

Yellowlegs sp..—Harriman counted 500 in Outagamie on 4 May.

Solitary Sandpiper.—First report 11 April in Oneida (Bowman). Reported from 25 counties in mostly below normal numbers, re-

maining through EOP in Barron (Goff). Frank counted 8 in Ozaukee on 11 May.

Willet.—First reported 21 April in Milwaukee (Peterson). Reports in mostly above normal numbers from 17 counties throughout, through 29 May in Burnett (Hoefler). Bontly counted 10 in Milwaukee on 24 April. In Dane, Hansen counted 16 on 1 May and Burcar counted 15 on 2 May.

Spotted Sandpiper.—First report 18 April in Dane (Hansen). Reports of normal and below normal numbers from 34 counties, remaining through EOP throughout. Verch counted 17 in Ashland/Bayfield on 16 May.

Upland Sandpiper.—First report on 27 April in Winnebago (Tessen). Reports from 17 scattered counties in below normal numbers, through EOP in Ashland, Bayfield, Douglas, Door, Dane, and Burnett. Berner counted 7 in Portage on 27 May.

Whimbrel.—First reported in Manitowoc 19 May (Peterson and Sontag each counted 7). Additional Manitowoc reports through 25 May, when Wood counted 24 flying in at the Manitowoc impoundment. Additional reports from Marinette on 25 May (J. Hansen); Kewaunee on 23 May (Regan, who counted six, representing the "second poor spring in a row" for this species); and last report from Racine on 26 May.

Hudsonian Godwit.—First reported in Outagamie on 9 May (Tessen). Additional reports from Milwaukee 11 May, Dane 16–18 May, Fond du Lac, Dodge, and Manitowoc 19 May, Chippewa 20 May, and last reported in Ozaukee 22–23 May (Uttech).

Marbled Godwit.—First report 21 April in Chippewa (Polk); also seen in April on the 27th in Manitowoc (Regan, Peterson). Hansen counted 23 in Dane on 15 May. Additional reports from Calumet, Douglas, Vilas, Manitowoc, Milwaukee, Eau Claire, Outagamie, Winnebago, and Door, where last reported on 23 May (Lukes).

Ruddy Turnstone.—First reported 8 May in Ozaukee (Uttech). Reports from 13 non-western counties in mostly below normal numbers. In Manitowoc, Tessen counted 250 on 21 May and Sontag counted 380 on 25 May. In Winnebago, Tessen counted 250 on 28 May. Remained through EOP in Manitowoc, Milwaukee, and Winnebago.

Red Knot.—All reports: Manitowoc on 18 May (Sontag and Peterson); Kewaunee on 25 May (Domagalski); 3 in Winnebago on 26 May (Harriman) and 28 May (Tessen).

Sanderling.—First report 11 May in Dane (Ashman and Hansen) and Winnebago (Ziebell). Reports from 10 non-western counties in below normal numbers, through EOP in Ashland, Bayfield, Douglas, and Ozaukee.

Semipalmated Sandpiper.—First report 18 April in Dane (Hansen). Reports from 16 non-western counties in below normal numbers, remaining in 8 counties through EOP. Ashman counted 75 in Dane on 21 May.

Western Sandpiper.—Tessen reported in Outagamie on 16 May.

Least Sandpiper.—First report in La-Crosse on 25 April (Dankert). Conspicuously missing through the season for Sheboygan, and several reporters noted that it was hard to find or missing this season. Reports in below normal numbers from 26 counties throughout, remaining through EOP in Ashland, Bayfield, Milwaukee, and Dane, where Hansen counted 120 on 3 May and Ashman counted 75 on 21 May.

White-rumped Sandpiper.—First reported 2 May in Ozaukee (Green). Tessen counted 15 in Outagamie on 21 May. Only other reports, in below normal numbers, from Milwaukee, Columbia, Dodge, and Dane, where reported through EOP (m.ob.).

Baird's Sandpiper.—First sighting 18 April in Chippewa, where Polk counted 20 on 21 April. Last report on 26 May in Outagamie (Tessen). Additional reports, in below normal numbers, from Ashland, Bayfield, Brown, Milwaukee, Ozaukee, and Dane. Notably missing from Oconto.

Pectoral Sandpiper.—First report 7 April in Dane (Ashman). Reported in below normal numbers in 17 counties throughout; last cited 26 May in Outagamie (Tessen). Ashman counted 18 in Dane on 11 April.

Dunlin.—First reports on 30 April in Milwaukee (Gustafson) and Ozaukee (Uttech). Reported in 19 counties in mostly below normal numbers through the EOP, with 50 still in Dane on 29 May (Tessen). On 13 May, Sontag counted 120 in Manitowoc, and on 21 May, Ashman counted 70 in Dane.

Stilt Sandpiper.—First reported 11 May in Dane (Tessen). Reported from 10 scattered counties through 24 May in Dane (Burcar). In Dane, Ashman counted 14 on 16 May. In Outagamie, Tessen counted 15 on both 16 and 22 May.

Ruff.—Tessen reports one male in Outagamie on 16 May.

Short-billed Dowitcher.—First reported 1 May in Brown (Mead). Notably missing from many areas, but reported from 16 counties throughout, through 30 May in Manitowoc (Sontag). On 16 May, Tessen found 60 in Outagamie.

Long-billed Dowitcher.—First report 13 May in Ozaukee (Uttech); also reported 14–26 May in Outagamie (Tessen and Nussbaum) and 21 May in Milwaukee (Diehl). Diehl noted plumage distinctions, and Nussbaum noted his identification was made by voice—all reporters should note how they distinguish this species from short-billed.

Dowitcher sp..—First dowitcher report 28 April in Dane (Ashman). Hilsenhoff counted 32 in Dane on 14 May. The Brassers found in Sheboygan on 18 May. It is much better to count "Dowitcher sp." than to count Long- or Short-billed without being certain.

Common Snipe.—First reported 19 March in Washington (Diehl). Reports of mixed numbers from 37 counties through the EOP. In Dane, Hilsenhoff counted 33 on 15 April.

American Woodcock.—Reports from 37 counties throughout in normal and below normal numbers, beginning 14 March in Ozaukee (Uttech), and remaining through the end of the season throughout. On 7 April, Belter reported 10 in Marathon; Frank counted 17 in Ozaukee on 18 May.

Wilson's Phalarope.—Reports in below normal numbers from 13 scattered counties (none in the western tier) between 20 April in Outagamie (Mead and Nussbaum) and 22 May in Winnebago (Bruce).

Red-necked Phalarope.—First reported in 9 May (Hansen) in Dane, where Ashman found one male and two females on 11 May. Other reports from Vilas on 19 May (Jim Baughman), and Outagamie on 21 May (Tessen).

Laughing Gull.—Reports from Manitowoc 21 and 23 May (Tessen), Milwaukee 21 May (Korducki), and Ozaukee 27 May (Domagalski) accepted by the Records Committee. Hilsenhoff reported one in Dane on 22 May.

Franklin's Gull.—First reported in Kewaunee 7 April (Regan). Next report 11 May in Milwaukee (Gustafson). Additional reports from Milwaukee, Brown, Chippewa, Ozaukee, and Manitowoc, where last seen 28 May (Sontag).

Little Gull.—First reported 16 May in Milwaukee (Korducki), where found through 19 May (Gustafson and Korducki). Seen in below normal numbers in Manitowoc 24 May through the end of the season (Sontag). Notably absent in Oconto.

Bonaparte's Gull.—Reports from 21 counties in mostly normal and above normal numbers beginning 7 April in Manitowoc (Sontag) and Milwaukee (Gutschow). Reported through the end of the season in Ashland-Bayfield, Douglas, Manitowoc, Milwaukee, Ozaukee, and Sheboygan. Several individuals counted flocks of over 1000 birds; Korducki noted 10,000+ in Milwaukee on 30 April, and Regan counted 10,000+ in Kewaunee on 12 May, noting that this coincided with "noticeably more alewife on beaches, and in water."

Ring-billed Gull.—Reported throughout the season from 35 counties in normal and above normal numbers. Diehl counted 1800 in Milwaukee on 19 March; Hilsenhoff counted 700 in Dane on 7 April; Sontag counted 985 in Manitowoc on 31 May; and Ziebell counted 7000 in Winnebago on 30 May.

Herring Gull.—Reported throughout the season in mostly normal numbers from 26 counties. Ziebell counted 100 in Winnebago on 12 April, and Sontag counted 359 in Manitowoc on 29 May.

Iceland Gull.—Reports accepted by the Records Committee from Manitowoc 6 May (Sontag) and 19 May (T. Schultz).

Lesser Black-backed Gull.—Reports from Milwaukee 16 March (Korducki); Manitowoc 7 April (Wood) and Douglas 20 April (R. Johnson) accepted by the Records Committee.

Glaucous Gull.—Reported from the BOP in Douglas, Manitowoc, and Sheboygan. Last reported in Ozaukee on 27 May (Domagalski) and through the EOP in Manitowoc (Sontag). Additional reports from Milwaukee, Winnebago, and LaCrosse, where Dankert found on 12 April. Sontag counted 7 in Manitowoc on 15 April.

Great Black-backed Gull.—Reports by many observers from 8 Great Lakes counties beginning at BOP in Kewaunee (Regan) and remaining through EOP in Door (Lukes). Also reported in Winnebago 24 March–11 April (Bruce) and La Crosse on 12 April (Dankert). Tessen counted 14 immatures on 3 April in Manitowoc.

Black-legged Kittiwake.—Sighting in Manitowoc 3 April (Tessen) was accepted by the Records Committee.

Caspian Tern.—Reports from 16 scattered counties in mostly normal and above normal numbers beginning 13 April in Milwaukee (Bontly) and remaining through EOP in 6 Great Lakes counties and also Winnebago and Dane. Ashman counted 19 in Dane on 13 May. Diehl counted 400+ in Milwaukee on 10 May, and Sontag counted 420 in Manitowoc on 13 May.

Common Tern.—Reports in normal and below normal numbers from 16 scattered counties beginning 20 April in Milwaukee (Korducki), and remaining through EOP in 6 Great Lakes counties. Frank counted 500 in Ozaukee on 11 May and 800 in Milwaukee on 14 May.

Forster's Tern.—Reports from 21 scattered counties in mostly normal numbers beginning 13 April in Milwaukee (Bontly) and Dodge (Domagalski), and remaining through EOP in 10 counties. Sontag counted 59 in Manitowoc on 3 May.

Black Tern.—Reports from 29 scattered counties in mostly normal and below normal numbers beginning 19 April in Dodge (Domagalski) and remaining through the EOP throughout.

Rock Dove.—Reports of normal numbers from 46 counties throughout the state throughout the season. Berner counted 70 in Portage on 12 March; Ziebell counted 80 in Winnebago on 11 May.

Mourning Dove.—Reports of mostly normal numbers from 50 counties throughout the state in normal numbers throughout the season. Belter counted 50+ in Marathon on 3 April and Ziebell counted 120 in Winnebago on 11 May.

Black-billed Cuckoo.—Reports in below normal number (with 4 observers reporting it missing altogether) from 18 counties beginning 18 May, the day it first appeared for many observers around the state.

Yellow-billed Cuckoo.—Reports in far below normal numbers (with 5 observers reporting it missing altogether); first report in Milwaukee 18 May (Gustafson); additional sporadic reports from Grant, Polk, Manitowoc, and, in the north, on 21 May, Bayfield-Ashland (Verch).

Eastern Screech-Owl.—Reports from 10 counties north to Brown, Clark, Marathon, and Winnebago throughout the season in mostly normal numbers (though conspicuously absent for one observer in Washington).

Great Horned Owl.—Reports from 37 counties throughout the season in mostly normal numbers (though conspicuously absent for observers in Sheboygan). In Marathon, Berner and Belter each reported 5, on 22 March and 11 May respectively.

Snowy Owl.—Reports from the beginning of the season from Bayfield-Ashland, Brown, Outagamie, Winnebago, and Clark,

where Decker reported the last one of the season on 31 March.

Northern Hawk-Owl.—Robbins reported one in Marquette on 9 March.

Barred Owl.—Reports from 36 counties throughout the season in mostly normal numbers (though one observer found it conspicuously absent from Ozaukee).

Great Gray Owl.—Reports from 19 counties from the beginning of the season, and seen through EOP in Bayfield (Erickson). See "By the Wayside" for more details.

Long-eared Owl.—Only reports from Milwaukee 22 April (Diehl) and Oconto 19–30 May (Smiths).

Figure 2. Great Gray Owl, St. Croix County. *Photo by Larry Gregg.*

Short-eared Owl.—Only reports from Clark, 31 March (Decker); Milwaukee 21 April (M. Peterson); and Douglas 1 May (LaValleys).

Boreal Owl.—Reports from Ashland, Bayfield, Douglas, Price, Shawano, and Sawyer, where Gregg found one live on 12 May. For additional details see "By the Wayside."

Northern Saw-whet Owl.—Diehl first reported on 3 March in Milwaukee, where he also saw on 18 April. Robbins reported one in Dane on 11 April. Northern reports from Ashland, Bayfield, Douglas, and Oconto through EOP. The LaValleys found three dead on their deck in Douglas on 1 May.

Common Nighthawk.—First report in Green on 12 May (Link). Reports from 38 counties in mostly below normal numbers, with three observers finding this once-common bird conspicuously absent. Ziebell counted 30 in Winnebago on 19 May, and Cahow counted 50 in Washburn on 20 May.

Whip-poor-will.—First report 10 April in Dane (Burcar). Reports from 24 counties in

Figure 3. Boreal Owl. *Photo by Carl Knudson.*

mostly below-normal numbers, and reported conspicuously absent by 3 reporters.

Chimney Swift.—Reports from 41 counties in mostly normal numbers beginning 18 April in Milwaukee (Korducki) and Winnebago (Bruce). Korducki counted 80 in Milwaukee on 11 May.

Ruby-throated Hummingbird.—Reports from 44 counties in mostly normal numbers beginning 3 May in Green (Link). (There was also one undocumented report from Ozaukee on 18 April.) Hardy counted a phenomenal 45 in Price on 11 May.

Belted Kingfisher.—Reports from 45 counties in normal and below normal numbers. Reports from the beginning of the season in Barron (Goff), Burnett (Hoefler) and Lafayette (McDaniel).

Red-headed Woodpecker.—Reports from 34 counties in normal and below normal numbers (and conspicuously absent for 3 observers), from the beginning of the season in Lafayette, Marathon, Richland, and Winnebago. Tessen counted 15+ in Grant and Iowa on 29 May.

Red-bellied Woodpecker.—Reports throughout the season from 38 counties north to Barron, Oconto, and Price, in mixed numbers.

Yellow-bellied Sapsucker.—Reports from 46 counties in normal and below normal numbers beginning 25 March in Dane (Ashman). Southern reports through the end of the season in Grant and Sauk. Dring counted 30+ in Vilas on 25 April.

Downy Woodpecker.—Reports throughout the season from 46 counties in normal numbers.

Hairy Woodpecker.—Reports throughout the season from 45 counties in normal and below normal numbers (conspicuously absent for two observers in Manitowoc and Sheboygan).

Black-backed Woodpecker.—Claire Gower found one in Iron 13 March. Kevin Thusius found in Sawyer on 5 May, Tessen found one in Shawano on 16 May; Jim Baughman found a male and a female in Vilas 22–26 May.

Northern Flicker.—Reports from 48 counties in normal and below normal numbers; from the BOP in Outagamie, Waushara, Lafayette, and Washington. Belter counted 20 in Marathon on 26 April, and Verch found 18 in Ashland/Bayfield on 13 May.

Pileated Woodpecker.—Reports from 44 counties throughout the season in normal numbers. Berner found 5 in Portage on 23 March.

Olive-sided Flycatcher.—Reports from 16 scattered counties in mostly below normal numbers (according to Berner, migration was notably late), beginning 2 May in Oneida (Bowman), and through the end of the season in Oneida and Vilas. Three observers in Lake Michigan counties reported it missing from areas where usually found.

Eastern Wood-Pewee.—Reports from 43 counties in normal and below normal numbers (and noticeably absent for one observer in Barron) beginning 1 May in Marathon (Ott). A 13 April report from Lafayette had no supporting details; most April "pewees" are really starlings imitating pewee songs, so to accept a record, we need at least a line of documentation indicating that the observer ruled this possibility out.

Empidonax spp..—Bontly reports that they were few and far between until the last few days of May, but on 31 May were suddenly everywhere in Milwaukee. Hilsenhoff said flycatchers arrived unusually late, and did little singing, so the *Empidonax* were virtually impossible to separate.

Yellow-bellied Flycatcher.—Reports from 21 counties in mostly normal and above normal numbers (though noticeably absent for one observer in Washington) beginning 17 May in Milwaukee (Domagalski). Reported through EOP in 7 counties south to Dane (Ashman). Ashman counted 11 in Dane on 25 May.

Acadian Flycatcher.—Reported from 10 scattered counties north to Marathon, Sheboygan, Fond du Lac, and Green Lake, in be-

low normal numbers, beginning 11 May in Fond du Lac (Schultz).

Alder Flycatcher.—Reports from 24 counties throughout, beginning 14 May in Vilas (Jim Baughman), in mostly normal and below normal numbers, and noticeably absent for 2 observers in Brown and Milwaukee. Remained through EOP south to Dane and Washington.

Willow Flycatcher.—First reported 28 April in Monroe (Kuecherer); reported in mostly normal numbers from 19 counties throughout, as far north as Langlade on 25 May (Soulen). Tessen counted 10 on 29 May in Iowa.

Least Flycatcher.—First reported 23 April in Dane (Burcar); reports from 41 counties in normal and below normal numbers (and noticeably missing for 2 observers). On 19 May the Smiths counted 20 in Oconto; on 20 May, Verch counted 21 in Bayfield/Ashland; and on 24 May Belter counted 21 in Marathon.

Eastern Phoebe.—Reports from 47 counties in mostly normal numbers beginning 21 March in Columbia (Tessen). Domagalski counted 9 in Washington on 15 April; Berner counted 9 in Portage on 26 May.

Great Crested Flycatcher.—Reports from 44 counties in mostly normal numbers beginning 7 April in Dane (Burcar); remaining through EOP throughout. On 23 May Belter counted 13 in Marathon; on 27 May the Smiths counted 12 in Oconto.

Western Kingbird.—Reports from Milwaukee 18 May (Gustafson) and Grant 29 May (Tessen).

Eastern Kingbird.—Reports from 45 counties in mostly normal numbers (though conspicuously absent for two observers in Brown and Dunn; Berner noted that migration was especially late for this species) beginning 18 April in Outagamie (Nussbaum). On 18 May Frank counted 14 in Ozaukee; on 20 May Verch counted 16 in Bayfield/Ashland.

Scissor-tailed Flycatcher.—Reports from Shawano 13 May (Shepard) and 15 May (Oberhauser) accepted by Records Committee.

Horned Lark.—Reported throughout the season in 40 counties in mostly normal numbers. Belter counted 25 in Marathon on 14 March; Hilsenhoff counted 29 in Dane on 15 April.

Purple Martin.—Reports from 31 counties in below normal numbers (and noticeably missing for one observer in Dunn), beginning 8 April in LaCrosse (Lesher). The Smiths counted 51 in Oconto on 27 May.

Swallow sp..—A big surge of migration was noted on 15 May, when Lesher counted about 2500 Chimney Swifts and swallows of all species in LaCrosse.

Tree Swallow.—Reports from 50 counties in normal and a few above normal numbers beginning 25 March in Milwaukee (Bontly). Ashman counted 300 in Dane on 11 April, Ziebell counted 210 in Winnebago on 20 April, and Belter counted 400 in Marathon on 27 April.

Northern Rough-winged Swallow.—Reports from 37 counties in mostly normal numbers beginning 6 April in Door (Lukes); on 10 and 11 May respectively, Hilsenhoff and Ashman each counted 30 in Dane.

Bank Swallow.—Reports from 37 counties in normal and below normal numbers beginning 8 April in Door (Lukes). On 19 May, Frank counted 100 in Ozaukee; on 21 May Ashman counted 50 in Dane.

Cliff Swallow.—Reports from 37 counties throughout in mostly normal numbers (though 2 observers found it conspicuously absent in Brown and Milwaukee). Belter counted 150+ in Marathon on 27 April.

Barn Swallow.—Reports from 46 counties in mostly normal numbers beginning 11 April in Washington (Domagalski). On 11 May, Ziebell counted 150 in Winnebago and Frank counted 230 in Ozaukee.

Gray Jay.—Reports throughout the season in normal and above normal numbers from Bayfield, Florence, Forest, Langlade,

Oneida, Vilas, and Price (where Hardy found as many as 6).

Blue Jay.—Reports from 51 counties throughout the state throughout the season in mostly normal numbers. Ashman counted 55 in Dane on May 12; Sontag counted 56 in Manitowoc on 18 May, and the Smiths counted 75 in Oconto on 19 May.

American Crow.—Reports from 51 counties throughout the state throughout the season (with the LaValleys noting large numbers returning to Douglas on 8 March) in mostly normal numbers. On 18 March, Belter counted 150 in Marathon.

Common Raven.—Reports from 22 northern and central counties throughout the season in mostly normal numbers.

Black-capped Chickadee.—Reports from 51 counties in normal and below normal numbers throughout the season throughout the state. The Smiths counted 31 in Oconto on 17 March; Frank counted 33 in Ozaukee on 11 May; and Belter counted 40 in Marathon on 16 April.

Boreal Chickadee.—Reports from Forest, Oneida, and Vilas, and also on 9–10 March down in Marathon (Belter and Ott).

Tufted Titmouse.—Reports from 13 counties north to Dunn throughout the season.

Red-breasted Nuthatch.—Reports from 42 counties throughout the state in mostly normal and above normal numbers, remaining through the end of the season in several central counties and even south to Walworth. A nest with four eggs was found at the end of May in Outagamie (Mielke).

White-breasted Nuthatch.—Reports from 47 counties throughout in mostly normal numbers.

Brown Creeper.—Reports in mostly normal numbers from the beginning of the season north to Washburn, and through the end of the season throughout all but the southern tier of counties. On 12 April, Domagalski counted 18 in Washington.

Carolina Wren.—Reports from Dane 16 April (a singing male seen and heard by Ashman) and 27 May (Hilsenhoff); Jefferson 23 April–3 May (Hale); and Waukesha, where one visited Anne Morette's feeder from BOP through 11 May.

House Wren.—Reports from 43 counties throughout in mostly normal and below normal numbers beginning 9 April in Ozaukee (Uttech). Belter counted 11 on 15 May in Marathon.

Winter Wren.—Reports from 28 counties in mostly normal numbers (though conspicuously absent for some observers in Marathon and Oconto) beginning 2 April in Manitowoc (Sontag), and remaining through EOP in 10 counties south to Grant, Fond du Lac, and Portage. On 4 April, Sontag counted 8 in Manitowoc.

Sedge Wren.—Reports from 25 counties in mostly below normal numbers beginning 18 April in Ozaukee (Uttech), and remaining through EOP in 17 scattered counties throughout. Belter counted 10 in Marathon on 11 May.

Marsh Wren.—Reports from 24 counties throughout in below normal numbers beginning 10 April in Ozaukee (Uttech); remaining through EOP in 16 scattered counties. On 11 May, Ziebell counted 130 in Winnebago.

Golden-crowned Kinglet.—Reports of normal and below-normal numbers from 28 counties between 26 March in Manitowoc (Sontag) and 22 May in Milwaukee (Bontly). Belter counted 15 on 27 April. Remained through EOP in Douglas, Vilas, and Fond du Lac.

Ruby-crowned Kinglet.—Reports from 44 counties in mostly normal numbers beginning 3 April in Polk, and remaining through EOP in the north and in Milwaukee and Monroe. On 3 May, Domagalski counted 200+ in Washington.

Blue-gray Gnatcatcher.—First reported by many observers 20 April in Dane, Milwaukee, and Washington. Reports in normal and above normal numbers from 33 counties north to Washburn (Cahow); remained

through the EOP in 17 counties. Ashman counted 20 in Dane on 16 May.

Eastern Bluebird.—Reported from the beginning of the season in Iowa (Burcar) and LaFayette (McDaniel). Next reported 11 March by many observers. Reports from 48 counties in normal and below normal numbers, through the EOP in 35 counties. Tessen counted 25 in Grant/Iowa on 29 May; Jeff Baughman counted 32 in Fond du Lac at the end of the season.

Mountain Bluebird.—Brandel's report from Outagamie on 4 April accepted by the Records Committee.

Townsend's Solitaire.—Regan found one in Door on six occasions 15–28 March.

Veery.—Reports from 43 counties in mixed numbers, beginning 4 May in Dane (Hilsenhoff) and Outagamie (Anderson/Petznick). Remained through EOP in 25 counties throughout. On 9 May Korducki counted 35 in Milwaukee, and on 11 May, Frank counted 21 in Ozaukee.

Gray-cheeked Thrush.—Reports from 26 counties in mixed numbers (above normal for some reporters in Manitowoc, Milwaukee, Ozaukee, and Sheboygan, yet completely absent or hard to find for others in Door, Milwaukee, and Washington). First report 18 April in LaCrosse (Lesher) and last report 29 May in Dane (Robbins). On 11 May, Tessen found 5 both in Columbia and in Sauk.

Swainson's Thrush.—Reports in mixed numbers from 36 counties beginning 12 April in Jefferson (Hale), and through EOP in 6 counties south to Dane. Frank counted 20 in Ozaukee on 11 May; Zehner counted 17 in Milwaukee on 23 May.

Hermit Thrush.—Reports from 41 counties in mostly normal and below normal numbers beginning 26 March in Green (Link); remaining through EOP in 12 counties south to Milwaukee. Zehner counted 20 in Milwaukee on 3 May.

Wood Thrush.—Reports from 39 counties in normal and below normal numbers, beginning 21 April in Green (Link) and Door (Lukes). Remained through EOP throughout. Belter counted 10 in Marathon on 15 May.

American Robin.—Reported from the beginning of the season in Brown, Door, Milwaukee, Portage, and several southern counties. Reports from a total of 50 counties in mostly normal numbers. Migration peaked 7–15 April, when several observers' day-counts numbered 120–210.

Varied Thrush.—One appeared at a feeder in Door 2–8 May (fide Lukes).

Gray Catbird.—Reports from 46 counties in normal numbers beginning 26 April in Monroe (Kuecherer). Belter counted 20+ in Marathon on 15 May, and Berner counted 16 in Portage on 18 May.

Northern Mockingbird.—All reports: 8 May in Walworth (Parsons); 16 May in Vernon (Dankert) and Door (Lukes); 21 May in Ashland (Verch); and 23–26 May in Marinette (Peterson, Tessen, Hansen, and Harriman).

Brown Thrasher.—Reports from 44 counties in normal and below normal numbers beginning 15 April in Dane (Burcar). Verch counted 9 in Ashland/Bayfield on 20 May.

American Pipit.—Reports from 10 scattered counties (none in the western tier), between 16 April in Outagamie (Tessen) and 1 June in Douglas (R. Johnson). Verch counted 36 in Ashland/Bayfield on 21 May.

Bohemian Waxwing.—Peterson reports 80 birds in Shawano on 8 March; Wood found a flock of 10 in Shawano on 10 March. Verch reports that they were present in Ashland/Bayfield from the BOP through 7 April, with 200+ present on 17 March.

Cedar Waxwing.—Reports from the BOP in Milwaukee, Barron, Marathon, Dane, and Waukesha, and during the season from a total of 36 counties, in mostly normal and below normal numbers. On 6 May in Dane, Ashman counted 120 and Hilsenhoff counted 150.

Northern Shrike.—Reports from 27 counties, from the BOP through 24 April in

Vilas (Jim Baughman), in mostly normal numbers. Belter found 5 in Marathon on 7 April.

Loggerhead Shrike.—Only report from Green on 30 May (Peterson).

European Starling.—Reported in normal numbers from 50 counties throughout. Evanson counted 123 in Dane on 23 March, and Ziebell counted 300 in Winnebago on 11 May.

White-eyed Vireo.—Reported 28 April in Ozaukee (Wood), 16 and 29 May in Iowa (Peterson, Tessen) and 26 May in Racine.

Bell's Vireo.—Reports from Iowa 19 May (Burcar) through 30 May (Peterson); Grant 28 May through EOP (Tessen and Wood); Lafayette 30 May (McDaniel); and Richland 30 May (Duerksen).

Solitary Vireo.—Reports from 28 counties throughout beginning 3 May in Milwaukee (Gutschow), in mostly normal numbers, though difficult to find in Ozaukee and Washington. Migration continued through 28 May in Milwaukee (Zehner) and Portage (Berner), with birds remaining through EOP in 7 counties south to Manitowoc and Sheboygan. Berner counted 5 in Portage on 13 May.

Yellow-throated Vireo.—Reports in mostly normal numbers (though conspicuously absent in Sheboygan and Washington) from 31 counties throughout, beginning 3 May in Dane (Hansen) and Iowa (Burcar).

Warbling Vireo.—Reports from 38 counties in normal and below normal numbers beginning 3 May in Dane (Hansen). Tessen counted 15 in Winnebago on 18 May.

Philadelphia Vireo.—Reports from 21 counties, none in the northern tier, in mixed numbers beginning 16 May in Dane (Evanson) and Milwaukee (Bontly and Korducki) and ending 29 May in Ozaukee (Uttech) and through the end of the season in Manitowoc (Sontag). Sontag counted 7 in Manitowoc on 20 May.

Red-eyed Vireo.—Reports from 40 counties throughout in normal and below normal numbers beginning 10 May in Dane (Robbins), Milwaukee (Korducki) and Monroe (Kuecherer). Ashman counted 30 in Dane on 25 May. Berner in Portage noted that migration was unusually late for this species.

Blue-winged Warbler.—Gutschow reported one in Milwaukee on 29 April. Reports from 24 counties in normal and below normal numbers, and some observers couldn't find in usual places in Sheboygan or Outagamie. Remained through EOP north to Door, Fond du Lac, Green Lake, Monroe, and Portage. Parsons counted 8 in Walworth on 8 May, and Berner found 5 in Portage on 26 May.

Golden-winged Warbler.—First reported by several observers in Dane and Milwaukee 9 May. Reports from 28 counties in normal and below normal numbers, remaining through EOP south to Polk, Fond du Lac, Monroe, and Wood.

Tennessee Warbler.—First reported 6 May in Ozaukee (Uttech). Reported from a total of 38 counties in mixed numbers, and difficult for some observers to find in Sheboygan. Late migration probably accounts for at least some of the birds remaining through EOP in Door, Douglas, Monroe, Winnebago, Dane, Burnett, and Polk. On 25 May, Ashman counted 30 in Dane; on 29 May, Tessen counted 25 still present in Grant.

Orange-crowned Warbler.—Reports from 19 counties in normal numbers (except noticeably absent from normal places in Oconto), between 25 April in LaCrosse (Lesher) and Milwaukee (Bontly and Domagalski), and 25 May in Dane (Robbins) and Milwaukee (Bontly).

Nashville Warbler.—Reports from 37 counties in normal and above normal numbers beginning 25 April in Milwaukee (Domagalski); remaining through EOP in 17 counties south to Dane. Berner counted 25 in Portage on 8 May, Korducki counted 40 in Milwaukee on 9 May, and Frank counted 17 in Ozaukee on 11 May.

Northern Parula.—Reports from 27 counties in normal and below normal numbers, beginning 3 May in Milwaukee (Korducki); remaining through EOP in 5 northern counties. On 16 May, Ashman counted 7 in Dane.

Yellow Warbler.—Reports from 46 counties in normal and above normal numbers beginning 28 April in Waupaca (Tessen). Migration peaked 13–24 May, when several observers' day counts ranged from 24 to 30+.

Chestnut-sided Warbler.—Reports from 42 counties in mostly normal numbers beginning 2 May in Washington (Faber); reports through EOP in 17 counties throughout. Berner counted 30 in Portage on 19 May; Belter counted 19 in Marathon on 24 May, and Hilsenhoff counted 18 in Dane on 21 May.

Magnolia Warbler.—Reports from 34 counties in mostly normal numbers beginning 4 May in Door (Lukes), and remaining through EOP as far south as Dane. Berner counted 16 in Portage on 19 May, and Ashman counted 13 in Dane on 25 May.

Cape May Warbler.—Reports from 31 counties in mostly normal and below-normal numbers beginning 6 May in Dane (Hilsenhoff). Reports as late as 29 May in Dane (Robbins) and 30 May in Grant (Wood), and remaining through EOP in Bayfield, Douglas, and Vilas. Ashman counted 8 in Dane on 10 May.

Black-throated Blue Warbler.—Reports in mixed numbers from 15 counties, none in the western tier (and conspicuously absent for observers in Milwaukee, Outagamie, and Waukesha), beginning 4 May in Door (Lukes). One male in Vilas provided a lovely lifer for Bob Green. Remained through EOP in Ashland, Bayfield, and Vilas.

Yellow-rumped Warbler.—Reports from 47 counties in mixed numbers, beginning 5 April in Iowa (Burcar); remaining through EOP in 10 counties south to Milwaukee (Korducki). Many day-counts of 100+ from 3–17 May; Domagalski counted over 600 in Washington on 3 May, and Korducki counted 300+ in Milwaukee on 9 May.

Black-throated Green Warbler.—Reports from 36 counties in mostly normal numbers, beginning 20 April in Waukesha (Domagalski); remained through EOP south to Milwaukee, Marathon, and Fond du Lac. On 9 May, Hilsenhoff counted 17 in Dane and Korducki counted 35 in Milwaukee.

Blackburnian Warbler.—Reports from 35 counties throughout in normal and above normal numbers (though hard to find in Barron), beginning 4 May in Dane (Ashman). Remained through EOP south to Sauk and Grant.

Yellow-throated Warbler.—All records: 16 May in Grant (Peterson); 18 May in Sheboygan (Henrikson), 25 May in Dane (Robbins); 28 May through EOP in Grant (C. Wood and Tessen). The Grant report was accepted by the Records Committee.

Pine Warbler.—Reports in mixed numbers from 29 counties in mixed numbers beginning 21 April in Monroe (Kuecherer); remained through EOP in 12 scattered central and northern counties. Domagalski counted 12 in Washington on 3 May.

Prairie Warbler.—All reports: 11–12 May in Dane (John Romano); 18 May in Shawano (Peterson); 29–30 May in Grant (Tessen, Wood, Korducki).

Palm Warbler.—Reports from 36 counties throughout in mostly normal numbers beginning 24 April in Washington (Domagalski); last migrants noted 25 May by several observers in Dane, Milwaukee, and Winnebago, and remaining through EOP in Bayfield, Door, Douglas, and Vilas. Domagalski counted 145 in Washington on 3 May, Korducki counted 150 in Milwaukee on 9 May, and Verch counted 100+ in Ashland/Bayfield on 14 May.

Bay-breasted Warbler.—Reports from 24 counties in normal and below normal numbers beginning 9 May in Dane (Ashman) and Milwaukee (Korducki). Last reports 29 May in Dane (Ashman) and through the EOP in Bayfield (P. Johnson), Douglas (R. Johnson) and Washburn (Cahow). Domagalski counted 21 in Washington on 24 May.

Blackpoll Warbler.—Reports from 30 counties in normal and above normal numbers (though conspicuously absent in Barron and Waukesha), beginning 2 May in Milwaukee (Diehl) and remaining through 31 May or later in Dane, Milwaukee, and Winnebago. Ashman counted 30 in Dane on 25 May.

Cerulean Warbler.—Reports from 16 counties (none in the northern tier) in normal and above normal numbers (though absent from some areas in Milwaukee), beginning 9 May in Milwaukee (Domagalski) and Sauk (Burcar). Tessen counted 15+ in Grant on 29 May, and Jeff Baughman counted 12 in Sheboygan at the end of the season.

Black-and-white Warbler.—Reports from 42 counties in mostly normal and above normal numbers beginning 19 April in Dane (Hansen), and remaining through EOP in 15 central and northern counties. There were several daily counts of 20+ from 9–12 May, Korducki counting 100 in Milwaukee on 9 May.

American Redstart.—Reports from 41 counties in mostly normal numbers beginning 7 May in Dane (Worley) and Door (Lukes). On 19 May, Hilsenhoff counted 34 in Dane and Berner counted 47 in Portage.

Prothonotary Warbler.—Reports from 8 counties in mostly normal numbers north to Monroe (Kuecherer) beginning 20 April in Dane (Burcar). Remained through EOP in Dodge, Grant, Monroe, and Polk.

Worm-eating Warbler.—First report 9 May in Milwaukee (Gustafson). Additional reports in Grant and Winnebago and, through the EOP, in Dane (Ashman) and Sauk (Burcar).

Ovenbird.—Reports from 47 counties in mostly normal numbers beginning 28 April in Milwaukee (Zehner). Korducki counted 55 in Milwaukee on 9 May.

Northern Waterthrush.—Reports from 34 counties in normal and below normal numbers beginning 24 April in Dane (Robbins), and remaining through EOP in 12 scattered counties. Korducki counted 40 in Milwaukee on 9 May.

Louisiana Waterthrush.—Reports from 12 non-northern counties in mixed numbers beginning 23 April in Sauk (Robbins), and remaining in Fond du Lac, Grant, and Polk through the EOP.

Kentucky Warbler.—First reported 16 May in Grant (Peterson), where was noted by several observers through the end of the season, Lesher noting at least 4 on 17 May, Tessen finding 10 on 29 May, and Wood counting 8 on 31 May. Additional reports 18 May in both Milwaukee (Gustafson) and Ozaukee (Uttech), and 24 May in Dane (Robbins).

Connecticut Warbler.—Reports from 17 counties in mostly below normal numbers beginning 14 May in Iowa (Burcar); notably missing for observers in Milwaukee, Ozaukee, Portage, Ashland and Bayfield, though Green found 2 in Ozaukee on 18 May. Late migration may account for low numbers, since first report in Douglas was not until 4 June (R. Johnson).

Mourning Warbler.—Reports from 29 counties in normal and above normal numbers beginning 7 May in Door (Stover), and remaining through the EOP south to Lake Michigan counties, Monroe, Washington, and Fond du Lac, where Jeff Baughman counted 22 at the end of the season.

Common Yellowthroat.—Reports from 43 counties in mostly normal numbers, beginning 3 May in Milwaukee (Bontly and Gutschow). Daily counts numbered in the 20s for several observers from 13–25 May.

Hooded Warbler.—First reported 26 April in both Manitowoc (Sontag) and Milwaukee (Domagalski); additional reports from Grant, Racine, and Washington, and through the EOP in Fond du Lac and Sheboygan (Jeff Baughman). (Notably missing for some observers in Dane, Milwaukee, Ozaukee, and Waukesha.)

Wilson's Warbler.—Reported from 39 counties in mostly normal and above normal numbers, beginning 8 May in Ozaukee (Uttech). Berner counted 16 in Portage on 19 May, and Domagalski counted 16 in Washington on 21 May. Remained through the EOP in 7 counties south to Dane and Grant.

Canada Warbler.—Reports from 31 counties in above normal numbers beginning 16 May in Dane (Hilsenhoff); remaining through EOP in 14 counties south to Sauk and Washington. Day-counts of 10 or more from 19–25 May; Domagalski counted 21 in Washington on 21 May.

Yellow-breasted Chat.—All reports: 20 May in Manitowoc (Sontag); 25 May through EOP in Dane (Ashman and Hansen); 29 May in Grant (Tessen).

Summer Tanager.—The Kuhn family found one on 27 May in Sheboygan.

Scarlet Tanager.—Reports from 40 counties in mostly below normal numbers (though migration was unusually late for this species) beginning 30 April in Ozaukee (Domagalski). Hansen counted 14 in Dane on 25 May and, at the end of the season, Jeff Baughman counted 16 in Fond du Lac and 18 in Sheboygan. On 18 May in Jefferson, Hale saw an orange male near her house, the "color of orange jello, with a darker head." She had two normal males nearby for comparison.

Western Tanager.—Reports from Waukesha 11 May (Aune), Winnebago 12 May (Rolf), Washington 13–17 May (Putz), Racine 14 May (DeBoer), and Clark, where one spent 3–4 days in early May at the feeder of Harland and Bettie Kuhl in Granton (Robbins).

Northern Cardinal.—Reports from 47 counties in normal numbers throughout the season.

Rose-breasted Grosbeak.—Reports from 48 counties in mostly normal numbers beginning 28 April in Dane (Burcar). Belter counted 18 in Marathon on 15 May, the Smiths found 15 in Oconto on 19 May, and the Lukes had 15 at their feeder in Door on 23 May.

Indigo Bunting.—Reports from 44 counties in mostly normal and above normal numbers beginning 3 May in Green (Link). The Smiths found 14 in Oconto on 19 May.

Dickcissel.—First reported in Green Lake 17 May (Schultz); one was seen on Madeleine Island in Ashland on 18 May (John Streitz); additional reports from Green, Iowa, Milwaukee, Ozaukee and through EOP in Dane and Sauk.

Eastern Towhee.—Reports from 41 counties throughout in normal numbers beginning 2 April in Walworth (Parsons). On 11 May, Frank found 10 in Ozaukee, and on 16 May Diehl found 9 in Washington.

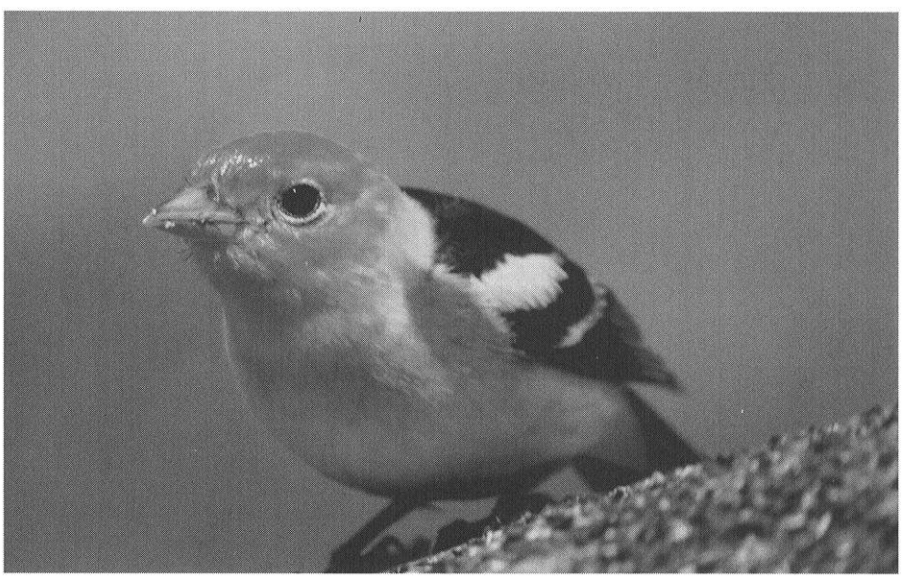

Figure 4. Western Tanager. *Photo by Bill Rolf.*

Spotted Towhee.—Reports from Milwaukee 31 March through 9 May (Huxley and Bontly) were accepted by the Records Committee. An additional one was reported from Shawano on 8 April (Peterson).

American Tree Sparrow.—Reports from 40 counties in mostly normal numbers from the BOP well into May throughout; final report 22 May in Door (Lukes). Belter counted 60+ in Marathon on 13 April, and Carlsen counted 100+ in Pierce on 14 April.

Chipping Sparrow.—Reports from 48 counties in mostly normal numbers beginning 9 April in Dane (Burcar). Verch counted 150+ in Ashland/Bayfield on 15 May, and Dring estimated 100's in Vilas on 19 May.

Clay-colored Sparrow.—Reports from 26 counties in normal numbers beginning 1 May in Ozaukee (Uttech). Remained through EOP in 13 counties from all areas of state except the south. Berner counted 45 in Portage on 27 May.

Field Sparrow.—Reports from 35 counties in normal and below normal numbers beginning 10 April in Dane (Robbins) and Green (Link). Ashman counted 14 in Dane on 20 April, and Frank counted 13 in Ozaukee on 11 May.

Vesper Sparrow.—Reports from 31 counties in normal and below normal numbers beginning 16 March in Winnebago (Tessen). Berner counted 23 in Portage on 21 April.

Lark Sparrow.—First reported 25 April in Iowa (Burcar). Additional reports from Douglas, and remaining in Monroe and Sauk through EOP.

Savannah Sparrow.—Reports from 41 counties throughout in mostly normal numbers beginning 11 April in Ozaukee (Frank) and Winnebago (Ziebell). Ziebell counted 114 in Winnebago on 11 May.

Grasshopper Sparrow.—Reports from 18 counties in below normal numbers beginning 29 April in Fond du Lac (Jeff Baughman), and remaining through EOP in 10 scattered counties. Berner counted 5 in Portage on 27 May, and Jeff Baughman counted 16 in Fond du Lac at the end of the season.

Henslow's Sparrow.—First report 19 April in Fond du Lac (Jeff Baughman). Additional reports from Iowa, Oconto, and remaining through EOP in Fond du Lac, Green Lake, and Marathon.

LeConte's Sparrow.—First reported 11 May in Douglas (LaValleys) and Marathon (Belter). Additional reports from Burnett, Oconto, and Sheboygan. Belter found 9 in Marathon on 11 May.

Nelson's Sharp-tailed Sparrow.—One report from Milwaukee on 22 May.

Fox Sparrow.—Reports from 34 counties in mixed numbers, from the BOP in Burnett (Hoefler), Dane (Ashman), and Jefferson (Hale). Several May reports, last on 13 May in Walworth (Parsons). Hilsenhoff counted 26 in Dane on 6 April.

Song Sparrow.—Reports from 49 counties in mostly normal numbers, from the BOP in Milwaukee (Korducki). Berner counted 60 in Portage on 10 April, and Ziebell counted 370 in Winnebago on 11 May.

Lincoln's Sparrow.—Reports from 25 counties in normal and below normal numbers beginning 18 April in Dane (Hansen), and remaining through EOP in Barron, Douglas, Manitowoc, Milwaukee, Ozaukee, Portage, Vilas, and Washburn. Ashman counted 6 in Dane on 13 May, and Belter counted 6 in Marathon on 15 May.

Swamp Sparrow.—Reports from 39 counties in mostly normal numbers beginning 30 March in Ozaukee (Uttech). On 11 May, Belter counted 45 in Marathon and Ziebell counted 120 in Winnebago.

White-throated Sparrow.—Reports from 46 counties in mostly normal numbers, from BOP in Dane (Ashman), Jefferson (Hale) and Washington (Diehl). On 29 April, Cahow counted 100's in Pierce; on 7 May, Verch counted 96 in Ashland/Bayfield; and on 15 May, Belter counted 140 in Marathon. Remained through EOP in 12 scattered counties, none in the southern tier.

White-crowned Sparrow.—Reports from 30 counties in mixed numbers beginning 25 April in Door (Lukes). A couple of reports listed as remaining through the EOP without details; last normal reports 25 May in Marinette (Tessen) and Ozaukee (Uttech). On 13 May, Williams found 25 in Marathon. On 8 May, Schultz found one with pale lores, presumably a *gambelii,* in Green Lake.

Harris's Sparrow.—Reports from 9 western and northern counties beginning 7 May in Burnett (Goff), and remaining through 23 May in Ashland/Bayfield (Verch). One was banded by Ed Peartree in Iowa on 16 May. Hoefler found 6 in Burnett on 14 May.

Dark-eyed Junco.—Reports from 47 counties, from the BOP in many counties north to Washburn, and remaining through EOP in Ashland, Barron, Bayfield, Burnett, Douglas, Vilas, and Washburn. Carlsen counted 500+ in Pierce on 3 April. Ashman reports an Oregon Junco in Dane ib 24 March.

Lapland Longspur.—Reports from 12 scattered, non-western counties beginning 9 March in Outagamie (Tessen). Last seen in Door on 21 May (Lukes). Several April day-counts numbered above 100; on 14 April, Ziebell counted 360 in Winnebago, and on 21 April, Decker counted 500 in Clark.

Snow Bunting.—Reports from 19 non-southern counties in mixed numbers, from the BOP through 22 May in Douglas (LaValleys). The Smiths counted about 100 in Oconto on 12 March, Hansen counted 250 in Brown on 29 March, Decker counted 1500+ in Clark on 2 April, and Verch counted 100+ in Ashland/Bayfield on 1 May.

Bobolink.—Reports from 39 counties in mostly normal numbers beginning 3 May in Ozaukee (Uttech), Portage (Berner), and Richland (Duerksen). On 11 May, Frank found 38 in Ozaukee, and on 17 May, the LaValleys found 98 in Douglas.

Red-winged Blackbird.—Reports from 51 counties in mostly normal numbers, from the BOP in several Lake Michigan and southern counties. Berner counted 400 in Portage on 30 March; Ashman counted 1000s in Dane on 11 April, Belter counted 500+ in Marathon on 26 April, and Ziebell counted 2700 in Winnebago on 11 May.

Eastern Meadowlark.—Reports from 45 counties in mostly normal numbers beginning 9 March in Green (Link). Belter counted 15 in Marathon on 4 May, Parsons counted 12 in Walworth on 8 May, and Berner counted 10 in Portage on 27 May.

Western Meadowlark.—Reports from 25 counties in normal and below normal numbers beginning 13 March in Green (Link) and Outagamie (Tessen).

Yellow-headed Blackbird.—Reports from 20 counties in normal and below-normal numbers beginning 10 April in Brown (Hansen). On 11 May, Belter counted 22 in Marathon and Ziebell counted 350 in Winnebago.

Rusty Blackbird.—Reports from 20 counties in mostly normal numbers (though conspicuously absent from Ashland, Bayfield, and Oconto), beginning 11 March in Outagamie (Tessen). Last report from Door 12 May (Lukes). On 11 April, Ashman found at least 100 in Dane, on 12 April Carlsen counted 100+ in Pierce, and on 26 April Belter counted 175+ in Marathon.

Brewer's Blackbird.—Reports from 25 counties in normal and below normal numbers beginning 13 March in Outagamie (Tessen). Reported at EOP in 13 scattered, non-southern counties. Domagalski found 600 on 13 April in Washington.

Common Grackle.—Reports from 49 counties in normal numbers, from the BOP in several Lake Michigan and southern counties. On 31 March, Ziebell counted 2000 in Winnebago, and on 11 April, Ashman counted 1000s in Dane. Dankert reports an albino in Vernon on 4 May.

Brown-headed Cowbird.—Reports from 47 counties in mostly normal numbers, from the BOP in Monroe (Kuecherer) and Oconto (Smiths), where at least one over-wintering banded male survived. Parsons counted 200 in Walworth on 16 March, and Belter counted 400+ in Marathon on 26 April.

Orchard Oriole.—Reported in 16 counties scattered throughout the state in above normal numbers beginning 9 May in Milwaukee (Korducki), and remaining through the EOP in Brown, Dane, and Vernon. On 19 May, the Smiths found 3 in Oconto and Harriman also found 3 in Sauk. On 30 May, Peterson found 4 in Iowa.

Baltimore Oriole.—Reports from 47 counties in mostly normal numbers beginning 3 May in Monroe (Kuecherer). Many day-counts of more than 10 birds from 9–25 May; the Smiths counted 28 in Oconto on 19 May.

Pine Grosbeak.—Reports from 8 counties south to Shawano from the BOP through 14 April in Door (Lukes). A 3 May report from Ozaukee had no supporting details.

Purple Finch.—Reports from 38 counties in mostly normal numbers throughout the season. Duerksen counted 93 in Richland on 14 April, and Domagalski counted 77 in Washington on 15 April.

House Finch.—Reports from 43 counties in mostly normal numbers throughout the season. On 31 March, Ziebell counted 100 in Winnebago, and on 7 April, Belter counted 50+ in Marathon.

Red Crossbill.—Reports from 9 counties south to Washington and Waukesha, in above normal numbers, and remaining in throughout the season in Portage, where Berner counted 103 on 10 May, and noted that one nest fledged three on 14 May, with at least two other nests under construction.

White-winged Crossbill.—Reports from 7 counties south to Waukesha from BOP in above normal numbers; Berner counted 85 in Portage on 3 March. Last reported 16 May in Fond du Lac (Jeff Baughman).

Common Redpoll.—Reports from 27 counties in above normal numbers from the BOP well into May; last reported in Bayfield on 23 May (P. Johnson). Many reports of more than 100 birds; Berner found 340 in Portage on 16 March and Bowman found 300 in Oneida on 20 April.

Hoary Redpoll.—The Smiths report one in Oconto from 7 March through 13 April. Verch reports one in Ashland/Bayfield from 10–24 March. Tessen reports one in Outagamie on 13 March. Berner reports 2 in Portage on 16 March. The LaValleys had one in Douglas 24 March, and Peterson had one in Shawano on 4 April.

Pine Siskin.—Reports from 41 counties in mostly above normal numbers throughout the season. On 3 March, Berner counted 90 in Portage; on 14 March, Williams counted 80+ in Marathon; and on 18 March, Belter also found 80+ in Marathon. Berner found at least 7 nests in Portage, and three had fledged young between 8 May and EOP.

American Goldfinch.—Reports from 48 counties in mixed numbers throughout the season. Several day counts of over 30 between 15 and 19 May. Duerksen counted 86 in Richland on 15 May.

Evening Grosbeak.—Reports from 20 counties south to Walworth (where Parsons found one on 10 May!) and Waukesha, in mixed numbers. Found through 23 May in Shawano (Tessen), and throughout the season in the north. The Lukes had 60 at their feeder in Door on 6 March.

House Sparrow.—Reports from 44 counties throughout the state throughout the season in normal numbers. Ziebell found 200 in Winnebago on 11 May.

Eurasian Tree Sparrow.—One found 30 March in Door (Yeomans).

Addendum.—White-faced Ibis reported from Racine, 24 April 1995 by DeBoer was accepted by the Records Committee.

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Sandhill Cranes *by Gerald H. Emmerich, Jr.*

"By the Wayside"

Observations of special interest include unusual feeding behavior in Cooper's Hawk and American Crow, a season of Great Gray Owl and Boreal Owl invasion.

Cooper's Hawk Feeding Behavior

During the period 16–21 December 1996, an immature (brown streaked breast) female (18–20 inches long) Cooper's Hawk (*Accipiter cooperii*) visited our backyard on four different days to pursue small songbirds using several feeding stations. Most of the common wintering birds are attracted to the seeds, suet, and water, where 15–20 birds are usually present. As a year-around feeding site, hawks regularly check out the area.

The above Cooper's Hawk visited in early afternoon, landing from the north in a large soft maple tree. The perch was approximately 20 yards above ground and approximately 30 yards from the main platform feeder. Weather conditions were clear and temperatures seasonal with an estimated 3 inches of snow cover. Cardinals, Dark-eyed Juncos, Black-capped Chickadees, House Sparrows, House Finches, nut hatches, starlings, Mourning Doves and Downy Woodpeckers usually were present. The feeding songbirds scattered when the hawk arrived. There was never a direct aerial attack. Most of the juncos, sparrows and finches dove into a cedar shrub hedge row next to the house. The dense hedge is about 12 feet long, 5 feet wide and 3 feet tall.

The hawk always sat for several minutes watching the area. It then flew down and landed on the ground about 3 feet from the north end of the hedge. It then walked behind the hedge next to the house. None of the songbirds flew out of the hedge. I could to see what the hawk was doing, but on two of the four days the hawk emerged at the south end with a small bird in it's left foot. The first capture was a junco, the other a House Sparrow. On each capture occasion, the prey was consumed in a tree near-by. After eating the junco, the hawk remained for 1¼ hours but did not pursue any of the juncos that returned to the feeder.

As a career wildlife biologist, an avid outdoor observer and long-term backyard bird feeder, I have seen many raptor chases and kills in a variety of species. In every case but one, a direct aerial chase or hover and drop on prey occurred. Once a Northern Goshawk was observed

chasing a male pheasant in a brushy fence line. The goshawk pursued the pheasant on the ground with great agility and speed, eventually capturing and killing the pheasant on the ground.

Observing raptor kills is often just luck, or very time consuming, and requires a knowledge of bird behavior alertness, awareness, etc., etc. Of interest here is how adaptable birds are. The songbirds adapted to the food, water and cover. The Cooper's Hawk found a ready food supply. The lack of a direct aerial attack may indicate an awareness of the hazards created by the hanging feeders, clothes lines, poles and hedges. Ground pursuit in dense cover did prove successful in two of four attempts. The Cooper's Hawk has been observed several times in the past several weeks on fly throughs, one stop for about five minutes and once when it landed in a tree to eat a junco captured in a neighbor's yard.

I wish to thank Greg Septon for review of the text.—*Richard A. Hunt, 309 Birchcrest Road, Horicon, WI 53032*

Great Gray Owls in Wisconsin, Spring, 1996

The winter of 1995–96 will long be remembered for the widespread appearance of Great Gray Owls in Wisconsin. These enormous owls are so unexpected, yet so conspicuous, that they were featured on some local television news programs and mentioned in many local newspapers. When one Green Lake County newspaper illustrated a Great Gray Owl article with a photograph of a Barred Owl, Thomas Schultz even wrote a tactful correction in a letter to the editor, providing accurate information to a large number of non-birders.

Many owls lingered into the spring season, with were at least 35 sightings in the state. Counties with reports through March include Ashland, Chippewa, Douglas, Dunn, Eau Claire, LaCrosse, Monroe, Polk, Price, Shawano, St. Croix, and Wood.

Counties with April reports include Burnett through 16 April (Hoefler), Clark through 20 April (Ken Luepke fide Decker), Green Lake through 11 April (Schultz), Jackson through 16 or 17 April (fide Polk), and Pierce through 17 April (Meacham).

Birds remained through the end of the season in Bayfield (Erickson).

Boreal Owls in Wisconsin, Spring, 1996

The saddest effect of the severe winter was the invasion of Boreal Owls into the state. Many of these owls were not even discovered until they had died. For example, in Douglas on 1 March, Steve LaValley "was going out to bring in fire wood when I noticed what I thought was one of our boys' mittens on the deck. When I picked it up I was saddened to find it was an owl . . . The bird appeared to have died very recently. No heart beat could be heard but the bird was warm and not yet stiff."

Boreal Owl records for the March include 2 dead ones found in Ashland, one dead one in Bayfield, 2 dead in Price, and one dead in Sawyer. A newspaper story about the die-off sparked reports to the LaValleys

in Douglas of at least 13 of these little owls.

Tessen and Peterson found a live one in Shawano on 8 March, and Gregg found a live one in Sawyer on the late date of 12 May.

American Crows (*Corvus brachyrhynchos*) Eating Sand

American Crows (*Corvus brachyrhynchos*) are omnivorous. As opportunity presents, they feed on carrion, shellfish, worms, snails, small crustaceans, insects (especially beetles, beetle larvae, grasshoppers, locusts, and crickets), amphibians, reptiles, mice, wild fruit, grain and other seeds, nuts, eggs, and small birds (Bent 1946, Goodwin 1976, Pough 1949). They have not been reported to feed regularly on inorganic matter. In this note, I report observations of American Crows consuming sand.

At approximately 1300 hours on 5 July 1997, I observed four American Crows walking on the swimming beach at Marshall Park in the city of Madison in central Dane County, Wisconsin (T7N, R8E, Sec. 12). Each crow was seen sporadically "pecking" the sand with an open mouth. Each two or three pecks was followed by a swallowing motion in which the Crows thrust their heads upward and opened and closed their mouths. There was no evidence that the Crows were finding food (i.e. they were not picking up objects of appreciable size, potential food items were not observed on the sand, etc.).

Three American Crows were observed in the same area on 6 July 1996. One of the Crows was observed pecking in the beach sand. The other two Crows were observed alternately flying to a small pile of sand deposited on a nearby fishing pier. The crows would approach the sand pile, peck two or three times, then fly away. Each Crow would survey the general area, looking around and overhead prior to pecking at the pile. After some pecking bouts, the Crows thrust their heads upward and opened and closed their mouths. One Crow was observed taking a billfull of sand by tipping its head sideways and skimming off the top of the pile.

These observations are similar to observations made in May 1993 along the Menominee River in Marinette, Wisconsin (T30N, R24E, Sec. 6). At that time, I observed two American Crows landing on an exposed sand flat in the middle of the river and pecking at the ground. Although Bent (1945) stated that it is not unusual to see American Crows thrusting their beaks into mud to secure worms, there was no evidence that the Crows I observed were obtaining food objects.

At least one other corvid is known to consume mineral material. In a study of Blue Jays (*Cyanocitta cristata*) cited by Bent (1946), "one of the first points to attract attention . . . was the large quantity of mineral matter, averaging 14 percent of the total contents." Kilham (1960) also reported observations of Blue Jays consuming sand on a daily basis in the spring. He concluded that the habit was related to the digestion of grains, acorns, and other hard fare.

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Big Day Counts: 1996

by Jim Frank

The 31 Big Day Counts for 1996 are a significant rebound up in activity from last year's 14 counts, and the usual 21–28 counts of recent years. Four counts surpassed 170 species (as opposed to 7 in 1992, 3 in 1993, 1 in 1994, and 2 counts in 1995). The top count came from R. Hoffman with an excellent total of 188 species. This was made all the more incredible in that he altered one of the traditions of Big Days in Wisconsin. He did not lay eyes on one of the Great Lakes in the course of the day. His list included 18 shorebirds, **30** warblers, and 14 sparrows. A count in the south central portion of the state by J. Baughman, S. Baughman, T. Schultz, and D. Tessen tallied 184 species including 19 shorebirds, 26 warblers, and 4 rails. Another impressive count of 181 was turned in from the northeast by Mead, Reed, and Reed as they found 9 hawks and 18 shorebirds. (Since they specifically stated that they only listed the birds seen by all three of them, I believe that suggests their count was even higher!) The fourth count was a fine 171 by Peterson, Peterson, and Tessen, also in the northeastern part of the state, with 17 shorebirds and an astounding 9 species of gulls. Four additional counts mounted totals above 160 species making a total of 8, (compared to 10 in 1992, 6 in 1993, 3 in 1994, and 3 in 1995).

The average date for 25 counts in 1992 was May 19, for 28 dates in 1993 it was May 14, for 21 dates in 1994 the average was May 18, and in 1995, the 14 count average was May 20. This year, without any counts in the northwestern part of the state where they are usually conducted during the last week of May, the 31 count average was May 18.

Combining all of the Big Day Counts, an amazing list of 266 species was recorded. In comparison, 1995 counts only found 239 species, 1994 counts had 252 species, 1993 had 256 species, and 1992 listed 262 species. Though there was no shortage of counts, this list was influenced by no counts in the previously favored northwestern part of the state for the second consecutive year. The most noteworthy of numerous spe-

cial sightings included Red-throated Loon, Eared Grebe, Yellow-crowned Night-Heron, Black and Surf Scoters, Yellow Rail, Piping Plover, American Avocet, Black-necked Stilt, Laughing, Franklin's, Little, Great Black-backed, Lesser Black-backed, Thayer's, Iceland, and Glaucous Gulls, Merlin, Northern Mockingbird, White-eyed Vireo, Yellow-throated Warbler, Prairie Warbler, Henslow's Sparrow, Harris' Sparrow, Snow Bunting, and Rusty Blackbird.

For those unfamiliar with the rules for WSO Big Day Counts:

1) Count must be taken between May 1–31.
2) Count must be taken within a 24 hour calendar day (midnight to midnight).
3) Count must taken within the state boundaries, but it may cover as many parts of Wisconsin as birders can reach in the time limit.
4) All participants must be within direct conversational contact at all times during the birding and traveling periods. This excludes meal and rest stops if birding is not conducted during these times. This limits the number of parties involved to **ONE** and participants to that number safely and comfortably contained in one vehicle (1–6?).
5) Areas can be revisited during the day.
6) Counting individuals is **optional.**
7) The same areas may be covered on **different** Big Day Counts.
8) No fees are involved in conducting the counts.
9) An official Big Day Count Form (available from the associate editor--D. Tessen) should be filled out for each count. It is critical that all unusual species—whether they be late sightings or rare species—be completely documented. Capitalized species on the form may be documented on the back of the form. New additions to the form should be documented on the traditional WSO Exceptional Record Documentation Form with probable review by the Records Committee.
10) Having fun is mandatory. Keeping your sanity is optional.

Details of the 1996 Big Day Counts follow; italicized species were unique to the 1996 Big Day Counts; italicized groups were the largest number of that group seen on this year's counts. Sharpen your birding skills and try a Big Day Count next year. As is apparent from this year's accounts, some birders drive like crazy on their counts, other restrict themselves to a yard, a nature center, or a county. They all are interesting.

Northeastern Region

Mead, Reed, Reed, 5/18/96, 181 species—Birding Oconto Marsh, Menomonee Co., Gresham, Navarino Wildlife Area, Bischoff Road, Barkhausen Preserve, Atkinson Marsh, Bay Beach Wildlife Sanctuary, Two Rivers, and Woodland Dunes, they located Horned Grebe, White Pelican, Snowy Egret, Tundra Swan, Red-shouldered Hawk, Yellow Rail, Marbled Godwit, Baird's Sandpiper, Black- throated Blue Warbler, Orchard Oriole, 2 grebes, 5 herons, 15 ducks, *9 hawks,* 2 galliformes, 3 rails, 18 shorebirds, 3 gulls, 2 owls, *7 woodpeckers,* 7 flycatchers, *4 wrens,* 7 *thrushes,* 5 vireos, 24 warblers, 10 sparrows, *10 blackbirds,* and 4 finches.

Table 1. Wisconsin Big Days—1996

Species	Observers	Date	Area	Time	Temp	Wind	Sky	Miles Car	Miles Ft.
188	Hoffman	5/17/96	NC	3:00–20:30	55–85	S 15	P.Cl	276	1
184	Baughman, Baughman, Schultz, Tessen	5/19/96	SC	0:00–20:00	65–85	S 20	P.Cl	505	2
181	Mead, Reed, Reed	5/18/96	NE	0:00–22:00	45–85	S 15	P.Cl	350	3
171	Peterson, Tessen, Peterson	5/23/96	NE	2:00–20:30	45–65	NE15	P.Cl	370	4
166	Tessen	5/11/96	SC	3:00–17:00	32–54	NE10	Clo.	410	1
164	Domagalski, Burcar	5/19/96	SC	4:00–20:00	70–90	SW20	Clear	312	2
164	Peterson	5/18/96	NE	2:00–22:30	55–85	NW20	P.Cl.	350	3
162	Smith, Smith	5/19/96	NE	2:45–21:30	57–83	SW15	P.Cl	207	1
158	Domagalski, Burcar, O'Connor	5/17/96	SE	4:00–21:30	45–80	S 10	Clear	260	3
158	Tessen	5/29/96	SW	4:30–18:00	42–67	NE10	Clear	390	1
156	Nussbaum, Parks, Petznick	5/20/96	NE	4:00–20:30	68–62	W 5	Clo.	323	3
155	Frank, Diehl	5/19/96	SE	3:50–20:10	75–88	SW25	Clo.	253	4
150	Frank	5/18/96	SE	3:10–17:10	65–87	SW25	P.Cl.	194	4
150	Peterson, Hoffman, Peterson	5/15/96	SC	2:00–21:00	55–65	SE15	Clo.	295	4
147	Domagalski	5/24/96	SE	5:00–20:00	42–56	NE20	Clo.	311	2
147	Domagalski, Burcar	5/27/96	SW	6:30–20:30	45–55	NE30	Rain	331	2
144	Donald, Sundell	5/18/96	SE	6:00–17:00	74–90	SW ?	Clo.	112	2
143	Diehl, O'Connor, Johnson	5/24/96	SE	4:15–20:50	52–59	SE10	P.Cl	259	2
139	Diehl	5/16/96	SE	4:55–21:00	48–56	E ?	Clo.	187	2
139	Domagalski, O'Connor	5/10/96	SE	5:30–20:30	42–49	NE15	Rain	243	3
136	Brouchoud, Rudy	5/22/96	NE	4:00–21:30	58–85	? ?	P.Cl	10	0
136	Frank	5/11/96	SE	4:10–18:10	34–52	N 18	Clo.	139	4
131	Dankert, Dankert	5/16/96	WC	4:38–23:59	54–70	E 12	Clo.	142	2
128	Woodcock, Erickson	5/24/96	NE	4:30–21:30	44–57	NE15	Clo.	239	3
127	Korducki	5/21/96	SE	5:30–13:00	58–75	SW10	Clear	55	6
126	Brasser, Brasser	5/18/96	SE	5:30–22:00	65–90	SW20	Clear	230	3
120	Korducki	5/09/96	SE	9:30–18:00	42–50	E 5	Rain	70	6
118	Korducki	5/18/96	SE	5:00–09:30	74–80	SW15	Clear	35	3
113	Tessen	5/04/96	SE	5:15–20:30	38–56	NE15	P.Cl.	350	1
111	Heagle, Warren, Sobczak, Lohre	5/27/96	WC	4:30–19:00	45–55	NE10	Rain	252	2
101	Peterson	5/02/96	NE	5:00–21:00	55–80	SW ?	P.Cl.	295	2

Peterson, Peterson, and Tessen, 5/23/96, 171 species—They visited Rat River Marsh, Navarino Wildlife Area, Stockbridge Indian Reservation, Green Bay, the Manitowoc Impoundment, and Red Arrow Park in Marinette. Interesting sightings included White Pelican, Cattle Egret, Mute Swan, King Rail, White-rumped Sandpiper, Laughing Gull, Franklin's Gull, Thayer's Gull, Iceland Gull, Great Black-backed Gull, Glaucous Gull, Northern Mockingbird, Black-throated Blue Warbler, Connecticut Warbler, Louisiana Waterthrush, 6 herons, 12 ducks, 4 hawks, 3 rails, 17 shorebirds, *9 gulls,* 2 owls, *7 woodpeckers,* 8 flycatchers, *4 wrens, 7 thrushes,* 3 vireos, 24 warblers, 8 sparrows, 8 blackbirds, and *5 finches.*

Peterson, Peterson, O'Connell, 5/18/96, 164 species—Starting at Rat River Marsh, they continued on to Navarino Wildlife Area, Stockbridge Indian Reservation, Shiocton ponds, Green Bay, and the Manitowoc Impoundment. The best for their day included Horned Grebe, White Pelican, Cattle Egret, Tundra Swan, Red-shouldered Hawk, Yellow Rail, King Rail, Willet, Red Knot, White-rumped Sandpiper, Stilt Sandpiper, Olive-sided Flycatcher, Black-throated Blue Warbler, 2 grebes, 5 herons, 15 ducks, 7 hawks, 3 galliformes, *4 rails,* 9 shorebirds, 3 gulls, 1 owl, 4 woopeckers, 6 flycatchers, *4 wrens,* 5 thrushes, 3 vireos, 22 warblers, 11 sparrows, and 8 blackbirds, and *5 finches.*

Smith and Smith, 5/19/96, 162 species—Their Big Day consisted of stops at birding areas only in Oconto County. The noteworthy birds were White Pelican, Tundra Swan, Mute Swan, *Oldsquaw,* Red-shouldered Hawk, Upland Sandpiper, *Long-eared Owl,* Connecticut Warbler, Henslow's Sparrow, Le Conte's Sparrow, Orchard Oriole, *Snow Bunting,* 5 herons, 2 swans, 10 ducks, 8 hawks, 2 galliformes, 13 shorebirds, 3 gulls, 3 owls, 6 woodpeckers, 5 flycatchers, 3 wrens, *7 thrushes,* 3 vireos, 22 warblers, 12 sparrows, 8 blackbirds, and 4 finches.

Nussbaum, Petznick, and Parks, 5/20/96, 156 species—Their morning began at Rat River Marsh, continuing on to Mosquito Hill Nature Center, Shiocton, Green Bay, the Manitowoc Impoundment, Two Rivers, James Island, and the "cornstacks area." Of note were Horned Grebe, White Pelican, Snowy Egret, Cattle Egret, Tundra Swan, *Snow Goose,* Common Goldeneye, Hudsonian Godwit, Stilt Sandpiper, *Lesser Black-backed Gull,* Connecticut Warbler, Hooded Warbler, 2 grebes, 7 herons, 15 ducks, 5 hawks, 1 galliformes, 13 shorebirds, 4 gulls, 2 owls, 4 woodpeckers, 6 flycatchers, 3 wrens, 5 thrushes, 5 vireos, 25 warblers, 8 sparrows, 7 blackbirds, and 3 finches.

Brouchoud, Rudy, 5/22/96, 136 species—In their usual Woodland Dunes *only* Big Day, they listed Olive-sided Flycatcher, Orange-crowned Warbler, Black-throated Blue Warbler, 4 herons, 6 ducks, 3 hawks, 3 galliformes, 4 shorebirds, 2 owls, 4 woodpeckers, 7 flycatchers, *4 wrens,* 5 thrushes, 26 warblers (for the second consecutive year), 10 sparrows, and 7 blackbirds.

Woodcock, Erickson, 5/24/96, 128 species—During their trip through the Manitowoc Impoundment, Lincoln Park, Woodland Dunes, Two Rivers, Silver Lake Park, Collins Marsh, Atkinson Marsh, Oconto Marsh, and Archibald Lake, they saw White Pelican, Mute Swan, *Whimbrel,* Franklin's Gull, *Little Gull,* Glaucous Gull, *Northern Saw-whet Owl,* 5 herons, 9 ducks, 5 hawks, 9 shorebirds, 6 gulls, 3 owls, 2 woodpeckers, 5 flycatchers, 3 wrens, 5 thrushes, 3 vireos, 21 warblers, 7 sparrows, 7 blackbirds, and 4 finches.

Peterson, 5/02/96, 101 species—This early Big Day hit Green Bay, Manitowoc, Milwaukee, Racine, and Goose Pond, with sightings of Eared Grebe, Horned Grebe, White Pelican, Yellow-crowned Night-Heron, Tundra Swan, *Piping Plover,* Glaucous Gull, 3 grebes, 3 herons, 15 ducks, 4 hawks, 11 shorebirds, 4 gulls, 3 woodpeckers, 1 flycatcher, 3 thrushes, 3 warblers, 7 sparrows, 6 blackbirds, and 4 finches.

North Central Region

Hoffman, 5/17/96, 188 species—This Big Day started at Buena Vista Marsh, and proceeded to Cranmoor Bogs, Wood County Wildlife Area, Bear Bluff Marsh, Necedah NWR, Castle Rock Flowage, Devil's Lake State Park, Baxter's Hollow, County PF, Mazomanie Bottoms, Arlington Ponds, and the Highway V Pond. Along the way, Hoffman saw Eared Grebe, Red-necked Grebe, Red-shouldered Hawk, *Greater Prairie Chicken, Sharp-tailed Grouse,* King Rail, Hudsonian Godwit, *Western Sandpiper,* White-rumped Sandpiper, Baird's Sandpiper, Stilt Sandpiper, *Long-billed Dowitcher, Short-eared Owl,* Olive-sided Flycatcher, Acadian Flycatcher, American Pipit, Black-throated Blue Warbler, Prothonotary Warbler, Louisiana Waterthrush, Hooded Warbler, Lark Sparrow, Le Conte's Sparrow, Henslow's Sparrow, Orchard Oriole, 3 grebes, 4 herons, 14 ducks, 7 hawks, *4 galliformes,* 3 rails, 18 shorebirds, 2 gulls, 2 owls, *7 woodpeckers, 10 flycatchers, 4 wrens, 7 thrushes,* 5 vireos, *30 warblers, 14 sparrows, 10 blackbirds,* and 2 finches.

Southwestern Region

Tessen, 5/31/96, 158 Species—This late, but impressive Big Day covered Governor Dodge State Park, Wyalusing State Park, the Wisconsin River, Spring Green, Arlington Ponds, Mud Lake Wildlife Area, Grassy Lake, the AW Ponds, Horicon NWR, Fond du Lac Co. C Pond, Rush Lake, Rat River, and Shiocton. The list of interesting sightings included Red-necked Grebe, Eared Grebe, Tundra Swan, Rough-legged Hawk, Red-shouldered Hawk, Northern Bobwhite, Upland Sandpiper, Red Knot, Western Sandpiper, Yellow-billed Cuckoo, Black-billed Cuckoo, Acadian Flycatcher, *Western Kingbird,* Tufted Titmouse, White-eyed Vireo, Bell's Vireo, Yellow-throated Warbler, *Prairie Warbler,* Prothonotary Warbler, Worm-eating Warbler, Louisiana Waterthrush, Kentucky Warbler, Connecticut Warbler, Hooded Warbler, Dickcissel, Lark Sparrow, Henslow's Sparrow, Orchard Oriole, 3 grebes, 5 herons, 11 ducks, *9 hawks, 4 galliformes,* 9 shorebirds, 2 gulls, *2 cuckoos,* 2 owls, *7 woodpeckers,* 9 flycatchers, 3 thrushes, 5 vireos, 17

warblers, 10 sparrows, and *10 blackbirds.*

Domagalski, Burcar, 5/27/96, 147 species—Their rain-soaked day included birding at Wyalusing State Park, Bakken's Pond, Spring Green Preserve, Governor Dodge State Park, Thousand Rock Prairie, Nine Springs Sewage Ponds, V Pond, the AW Ponds, Horicon NWR, Pike Lake State Park, Virmond Park, and the Milwaukee Coast Guard Impoundment. Among their best were Eared Grebe, Mute Swan, Common Goldeneye, Upland Sandpiper, White-rumped Sandpiper, Laughing Gull, Glaucous Gull, Acadian Flycatcher, Tufted Titmouse, White-eyed Vireo, Bell's Vireo, Yellow-throated Warbler, Prothonotary Warbler, Louisiana Waterthrush, Kentucky Warbler, Henslow's Sparrow, 2 grebes, 3 herons, 14 ducks, 4 hawks, 1 galliformes, 9 shorebirds, 5 gulls, 6 woodpeckers, 6 flycatchers, 3 wrens, 5 thrushes, 7 *vireos,* 22 warblers, 8 sparrows, 8 blackbirds, and 2 finches.

Western Central Region

Dankert, Dankert, 5/16/96, 131 species—Exploring La Crosse Ridge, La Crosse River State Trail, LaCrosse River Marsh, Catholic Cemetery, Goose Island, Pool 8 of the Mississippi River, South Stoddard, Genoa Fish Hatchery, and Western Vernon County, they found White Pelican, Surf Scoter, Stilt Sandpiper, Tufted Titmouse, Northern Mockingbird, Prothonotary Warbler, *Harris' Sparrow,* 4 herons, 11 ducks, 6 hawks, 8 shorebirds, 7 *woodpeckers,* 4 flycatchers, 5 thrushes, 3 vireos, 20 warblers, 10 sparrows, and 7 blackbirds.

Heagle, Lohre, Sobczak, and Warren, 5/27/96, 111 species—They birded Eau Claire County, Buffalo County, the Mississippi River, Merrick State Park, Trempealeau Wildlife Refuge, and Perrot State Park finding Black-billed Cuckoo, Tufted Titmouse, 3 herons, 7 ducks, 6 hawks, 2 shorebirds, 6 woodpeckers, 4 flycatchers, 1 wren, 4 thrushes, 3 vireos, 14 warblers, 7 sparrows, 7 blackbirds, and 2 finches.

South Central Region

Baughman, Baughman, Schultz and Tessen, 5/19/96, 184 species—They visited White River Marsh, Comstock Bog, Mud Lake Wildlife Area, Horicon NWR, Kettle Moraine State Forest, the AW Ponds, Lake Maria, Grand River Marsh, Lake Puckaway, Lake Maria, Shiocton, Green Bay, Manitowoc/Two Rivers, and Sheboygan. Their unusual sightings were Red-necked Grebe, Horned Grebe, White Pelican, Snowy Egret, Cattle Egret, Tundra Swan, Yellow Rail, King Rail, *Black-necked Stilt,* Hudsonian Godwit, White-rumped Sandpiper, Stilt Sandpiper, Thayer's Gull, Iceland Gull, Acadian Flycatcher, Louisiana Waterthrush, Connecticut Warbler, Henslow's Sparrow, Orchard Oriole, 7 herons, 15 ducks, 8 hawks, 3 galliformes, *4 rails, 19 shorebirds,* 5 gulls, 2 owls, 4 woodpeckers, *4 wrens,* 5 thrushes, 4 vireos, 26 warblers, 10 sparrows, and *10 blackbirds,* and 4 finches.

Tessen, 5/11/96, 166 species—Birding Rush Lake, Mud Lake Wildlife Area, Arlington Ponds, UW Arboretum, Baxter's Hollow, County PF, Devil's Lake State Park, Lake Maria,

AW Ponds, Horicon NWR, Green Bay, and Shiocton, he listed Eared Grebe, Horned Grebe, Red-necked Grebe, White Pelican, Snowy Egret, Cattle Egret, Tundra Swan, Common Goldeneye, Common Merganser, Northern Bobwhite, King Rail, Stilt Sandpiper, Olive-sided Flycatcher, Prothonotary Warbler, Lark Sparrow, Northern Junco, amd Lapland Longspur, *4 grebes, 9 herons,* 18 ducks, *9 hawks,* 3 galliformes, 3 rails, 13 shorebirds, 3 gulls, 3 owls, 6 woodpeckers, 4 flycatchers, 3 wrens, 6 thrushes, 2 vireos, 20 warblers, 9 sparrows, 8 blackbirds, and 3 finches.

Domagalski, Burcar, 5/19/96, 164 species—This day found them birding Helena Marsh, Spring Green Preserve, Governor Dodge Stae Park, Thousand Rocks Prairie, UW Arboretum, Nine Springs Sewage Ponds, V Ponds, Kelly Pond, AW Ponds, Horicon NWR, Pike Lake State Park, and the Milwaukee Coast Guard Impoundment. Special sightings included Eared Grebe, Mute Swan, Peregrine Falcon, Hudsonian Godwit, White-rumped Sandpiper, Baird's Sandpiper, Stilt Sandpiper, Olive-sided Flycatcher, Tufted Titmouse, White-eyed Vireo, Connecticut Warbler, Dickcissel, Henslow's Sparrow, 2 grebes, 5 herons, 12 ducks, 7 hawks, 3 galliformes, 16 shorebirds, 3 gulls, 2 owls, 5 woodpeckers, 9 flycatchers, 3 wrens, 5 thrushes, 5 vireos, 23 warblers, 11 sparrows, 8 blackbirds, and 2 finches.

Peterson, Peterson, Hoffman, 5/15/96, 150 species—Areas visited included Mud Lake Wildlife Area, Waunakee Marsh, Law's Bottoms, Schlukabier Prairie, Baxter's Hollow, Devil's Lake State Park, Crystal Lake, and Horicon NWR. Of interest were Horned Grebe, Red-necked Grebe, Red-shouldered Hawk, King Rail, White-rumped Sandpiper, Baird's Sandpiper, Stilt Sandpiper, Prothonotary Warbler, Louisiana Waterthrush, Lark Sparrow, Orchard Oriole, 3 grebes, 5 herons, 12 ducks, 5 hawks, 3 galliformes, 3 rails, 9 shorebirds, 1 gull, *7 woodpeckers,* 4 flycatchers, *4 wrens,* 6 thrushes, 2 vireos, 22 warblers, 12 sparrows, 10 blackbirds, and 3 finches.

Southeastern Region

Domagalski, Burcar, O'Connor, 5/17/96, 158 species—Starting at Loews Lake, they continued on to Zinn Bog, Holy Hill, Noyes Park, Kletzsch Park, Lincoln Park, Estabrook Park, Shorewood Nature Preserve, Lake Park, the Milwaukee Coast Guard Impoundment, South Shore Park, Virmond Park, Pioneer Road Sod Farms, Pike Lake State Park, Theresa Marsh, Horicon NWR, AW Ponds, and the Nine Springs Sewage Ponds. They reported Eared Grebe, Yellow-crowned Night Heron, Mute Swan, Peregrine Falcon, American Avocet, Willet, White-rumped Sandpiper, Baird's Sandpiper, Olive-sided Flycatcher, Prothonotary Warbler, Connecticut Warbler, 2 grebes, 5 herons, 12 ducks, 6 hawks, 1 galliformes, 17 shorebirds, 3 gulls, 2 owls, 4 woodpeckers, 6 flycatchers, 3 wrens, 8 sparrows, and 2 finches.

Diehl, Frank, 5/19/96, 155 species—Their day began at Cedarburg Bog, with stops at Hawthorne Hills County Park, Waubedonia Park, Belgium Pond, Riveredge Nature Center, Vir-

mond Park, Ulao Parkway, Port Washington Harbor, Theresa Marsh, Horicon NWR, AW Ponds, and the Milwaukee Coast Guard Impoundment. Of interest were Cattle Egret, Mute Swan, Black Scoter, Surf Scoter, Black-billed Cuckoo, Black-throated Blue Warbler, Louisiana Waterthrush, Connecticut Warbler, 6 herons, 14 ducks, 7 hawks, 2 galliformes, 9 shorebirds, 3 gulls, no owls, 5 woodpeckers, 8 flycatchers, 3 wrens, 5 thrushes, 3 vireos, 24 warblers, 11 sparrows, 9 blackbirds, and 2 finches.

Frank, 5/18/96, 150 species—Again starting at Cedarburg Bog, he moved on to Hawthorne Hills County Park, Waubedonia Park, Belgium Pond, Kletzsch Park, Milwaukee Coast Guard Impoundment, Virmond Park, Ulao Parkway, Port Washington Harbor, and Harrington Beach State Park. Unusual birds were few, but included Cattle Egret, Common Goldeneye, Black-billed Cuckoo, Olive-sided Flycatcher, 5 herons, 14 ducks, 6 hawks, 3 galliformes, 6 shorebirds, 3 gulls, 5 woodpeckers, 8 flycatchers, 3 wrens, 6 thrushes, 5 vireos, 23 warblers, 11 sparrows, 7 blackbirds, and 3 finches.

Domagalski, 5/24/96, 147 species—Once again starting at Loews Lake, he made stops at Zinn Bog, Holy Hill, Pike Lake State Park, Noyes Park, Kletzsch Park, Estabrook Park, the Milwaukee Coast Guard Impoundment, Virmond Park, the Rock River floodplain swamps, AW Ponds, Horicon NWR, Barkhausen Preserve, and Atkinson Marsh. Of note were White Pelican, Mute Swan, Surf Scoter, Common Goldeneye, Peregrine Falcon, Great Black-backed Gull, Prothonotary Warbler, Connecticut Warbler, 4 herons, 17 ducks, 6 hawks, 1 galliformes, 7 shorebirds, 4 gulls, 4 woodpeckers, 8 flycatchers, 3 wrens, 6 thrushes, 3 vireos, 25 warblers, 8 sparrows, 8 blackbirds, and 2 finches.

Donald and Sundell, 5/18/96, 144 species—Their Big Day included stops at Cedarburg Bog, Ehlers Park, Harrington Beach State Park, the Milwaukee River Parks, and the Milwaukee Coast Guard Impoundment. Birds worth mentioning were Cattle Egret, Yellow-billed Cuckoo, Olive-sided Flycatcher, Black-throated Blue Warbler, Connecticut Warbler, Northern Junco, 5 herons, 9 ducks, 6 hawks, 7 shorebirds, *2 cuckoos,* 2 owls, 3 woodpeckers, 8 flycatchers, 2 wrens, 5 thrushes, 5 vireos, 26 warblers, 9 sparrows, 7 blackbirds, and 3 finches.

Diehl, O'Connor, and Johnson, 5/24/96, 143 species—Starting at Loews Lake, they also birded Holy Hill, Pike Lake State Park, Cedarburg Bog, Riveredge Nature Center, Fredonia, Port Washington Harbor, Ulao Parkway, Horicon NWR, AW Ponds, and the Milwaukee Coast Guard Impoundment. Of note were Mute Swan, Baird's Sandpiper, Olive-sided Flycatcher, Black-throated Blue Warbler, Louisiana Waterthrush, Orchard Oriole, 4 herons, 12 ducks, 4 hawks, 2 galliformes, 9 shorebirds, 4 woodpeckers, 7 flycatchers, 5 thrushes, 4 vireos, 25 warblers, 9 sparrows, 9 blackbirds, and 2 finches.

Diehl, 5/16/96, 139 species—Trying a different approach, he began birding at Bong Receation Area, proceeding on to Wind Point, Grant Park, Sheridan Park, Cedarburg Bog, Belgium Pond, Riveredge Nature Center, Pike Lake State Park, and finishing around Holy Hill. The most interesting birds were Tundra Swan, Common Merganser, Black-throated Blue Warbler, Henslow's Sparrow, 3 herons, 12 ducks, 6 hawks, 2 galliformes, 11 shorebirds, 4 woodpeckers, 6 flycatchers, 3 wrens, 6 thrushes, 2 vireos, 18 warblers, 12 sparrows, 8 blackbirds, and 3 finches.

Domagalski, O'Connor, 5/10/96, 139 species—This effort included stops at the Milwaukee Coast Guard Impoundment, South Shore Park, Lake Park, Shorewood Nature Preserve, Estabrook Park, Kletzsch Park, Virmond Park, Pioneer Road Sod Farms, Pike Lake State Park, Theresa Marsh, Horicon NWR, AW Ponds, the DM and Harvey Road Ponds, and Goose Pond. They reported Yellow-crowned Night-Heron, Mute Swan, Peregrine Falcon, Olive-sided flycatcher, Black-throated Blue Warbler, Louisiana Waterthrush, *Rusty Blackbird,* 5 herons, 18 ducks, 6 hawks, 1 galliformes, 9 shorebirds, 3 gulls, 2 woodpeckers, 6 flycatchers, 3 wrens, 6 thrushes, 1 vireo, 22 warblers, 8 sparrows, 8 blackbirds, and 2 finches.

Frank, 5/11/96, 136 species—This Ozaukee County only Big Day in conjunction with the North American Migration Count involved birding at Cedarburg Bog, Hawthorne Hills County Park, Waubedonia Park, Belgium Pond, Ulao Parkway, Port Washington Harbor, and Harrington Beach State Park. Of interest were Horned Grebe, Common Goldeneye, Peregrine Falcon, Upland Sandpiper, Glaucous Gull, Northern Junco, 2 grebes, 1 heron, 14 ducks, 6 hawks, 3 galliformes, 11 shorebirds, 4 gulls, 4 woodpeckers, 4 flycatchers, 3 wrens, 7 thrushes, 2 vireos, 15 warblers, 11 sparrows, 7 blackbirds, and 4 finches.

Korducki, 5/21/96, 127 species—This Milwaukee County only Big Day found Peregrine Falcon, Marbled Godwit, Laughing Gull, Franklin's Gull, Olive-sided Flycatcher, Black-throated Blue Warbler, Connecticut Warbler, Orchard Oriole, 3 herons, 10 ducks, 4 hawks, 4 shorebirds, 5 gulls, 5 woodpeckers, 9 flycatchers, 2 wrens, 6 thrushes, 4 vireos, 22 warblers, 8 sparrows, and 7 blackbirds.

Brasser and Brasser, 5/18/96, 126 species—This Big Day included visits to Horicon NWR, Theresa Marsh, Laukauna, Barkhausen Wildlife Preserve, Bay Beach Wildlife Sanctuary, Sheboygan Harbor, Maywood Environmental Center, and Terry Andrae State Park. Noteworthy sightings were White Pelican, Yellow-billed Cuckoo, Black-throated Blue Warbler, 5 herons, 11 ducks, 5 hawks, 5 shorebirds, 2 gulls, 3 woodpeckers, 5 flycatchers, 3 wrens, 5 thrushes, 5 vireos, 22 warblers, 6 sparrows, 8 blackbirds, and 2 finches.

Korducki, 5/09/96, 120 species—In another Milwaukee County only effort, he saw Yellow-crowned Night-Heron, Black-throated Blue Warbler, Louisiana Waterthrush, Orchard Oriole, 3 herons, 12 ducks, 5 hawks,

2 shorebirds, 3 woodpeckers, 4 flycatchers, 2 wrens, 7 thrushes, 2 vireos, 23 warblers, 7 sparrows, and 8 blackbirds.

Korducki, 5/18/96, 118 species—In a 4.5 hour effort, once again in Milwaukee County, the list included Merlin, Peregrine Falcon, Olive-sided Flycatcher, Connecticut Warbler, Dickcissel, 3 herons, 9 ducks, 6 hawks, 5 shorebirds, 3 gulls, 4 woodpeckers, 7 flycatchers, 1 wren, 5 thrushes, 4 vireos, 22 warblers, 6 sparrows, 4 blackbirds, and 3 finches.

Tessen, 5/04/96, 113 species—This early unplanned Big Day covered Theresa Marsh, Racine Colonial Park, the Milwaukee Coast Guard Impoundment, Estabrook Park, Virmond Park, Port Washington Harbor, Harrington Beach State Park, Sheboygan Harbor, Cleveland, Manitowoc Impoundment, Two Rivers, Mishicot Pond, Thousand Islands, and Shiocton. Listings included *Red-throated Loon,* Horned Grebe, Yellow-crowned Night-Heron, Tundra Swan, Common Goldeneye, American Avocet, Willet, Glaucous Gull, Louisiana Waterthrush, and Northern Junco, *2 loons,* 2 grebes, 4 herons, *20 ducks,* 6 hawks, 10 shorebirds, 4 gulls, 1 owl, 4 woodpeckers, no flycatchers, 1 wren, 3 thrushes, no vireos, 8 warblers, 7 sparrows, 6 blackbirds, and 3 finches.

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May Day Counts: 1996

by Jim Frank

The 23 May Counts in 1996 is average for the past 8 years. Leading the way in participation were Marathon (37), Winnebago (26), Waukesha (26), and Racine/Kenosha (24).

Eight counts exceeded 150 species with Oconto leading the way with an impressive 184 species, followed by Ozaukee/Milwaukee at 182 species, and Winnebago at 180 species. Strong counts of 170 from Ashland/Bayfield, 168 from Fond du Lac and Racine/Kenosha, 155 from Kenosha, and 151 in Marathon were also compiled. Interestingly, 5 of the 8 highest counts were conducted on the early date of May 11 in cold, windy weather. Four of those May 11 counts were also conducted as part of the North American Migration Count.

The 253 species this year is easily the highest of the past 8 years. Previous totals ranged from 240 to 247. Of note was the unexpected numbers of late migrants, due to the early dates for many of the counts coupled with a very late spring (or late winter as it may have seemed in the northern part of the state). Waterfowl, winter finches, other winter residents, and early spring passerines were all found lingering in Wisconsin well into May. May Counts with Great Gray Owls, Northern Shrikes, Rough-legged Hawks, Northern Juncos, Oldsquaws, and White-winged Crossbills are unprecedented in recent memory. In spite of that wintery flavor to the counts, there was a surprising variety of other surprises. Southern wanderers included a Summer Tanager, Yellow-throated Warbler, Hooded Warbler, Northern Mockingbird, White-eyed Vireo, Acadian Flycatcher, and Snowy Egret. Hard to find northern residents included the Great Gray Owl, Long-eared Owl, Boreal Chickadee, Gray Jay, and Black-backed Woodpecker. Other migrants of note included Red-necked Phalarope, American Avocet, American Pipit (4 counts), and White Pelicans (3 counts). Yellow Rails on 2 counts, Dickcissels on 3 counts, and Henslow's Sparrows on 5 counts round out the long list of noteworthy species.

On the late side, Crested Flycatchers, Black-billed Cuckoos, all vireos,

Scarlet Tanagers, Tennessee Warblers, Golden-winged Warblers, and Magnolia Warblers found themselves underrepresented on the counts. Semipalmated Plovers and Wilson's Phalaropes were also in short supply for uncertain reasons. One other bird of unexplained diminished representation was the Western Meadowlark.

To refresh everyone's memory, the W.S.O. May Day Count Rules are as follows:

1) Count period is May 1–31.
2) Count must be taken within a 24 hour calendar day.
3) Count must cover a set area, ideally a circle consisting of a predetermined distance diameter (10,15,20 miles??) or a county.
4) The number of parties and observers involved may vary.
5) Count areas may be recovered as often as desired during the count day, unless individuals are being tallied.
6) The counting of individuals is optional.
7) Do not initiate a May Count within an area where one is already conducted. Instead join the existing count or establish one in a new area.
8) There are no count fees.
9) Be sure to fill out an official May Count form. Completely document unusual species, whether they be late or rare. Send the completed form with documentation to associate editor by June 10.

Please note the North American Migration Count is simlar to the May Count but differs in that:

1) The Count is restricted to **the second Saturday in May.**
2) Individual **numbers** of each species are counted.
3) Party hours are counted.
4) The boundaries for the count are a county.
5) A separate form is filled out from the state North American Migration Count coordinator.

One count can qualify for both a May Count and a North American Migration Count if conducted with these added rules.

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Table 1. 1996 May Day Counts.

Count	Date	Time	Sky	Wind	Temp	Observ.	Party	Species
Ashland/Bayfield	5/21	04:00–16:00	P.Cl.	NW 5	57–73	17	5	170
Burnett	5/17	03:56–21:30	Clo.	W15	34–74	2	1	121
Oxbo/Fifield	5/18	07:00–19:00	P.Cl.	0	52–60	10	?	71
Vilas	5/26	00:00–21:30	P.Cl.	SE 7	46–68	3	1	110
Clark	5/11	05:00–20:45	P.Cl.	N 10	28–51	11	7	120
Marathon	5/11	06:00–18:00	P.Cl.	NW10	29–54	37	15	151
Portage	5/11	04:00–19:00	P.Cl.	SE10	24–53	19	9	130
Shawano	5/11	04:00–21:00	P.Cl.	NE15	30–55	6	4	114
Oconto	5/19	02:45–19:30	P.Cl.	SW10	57–83	6	3	184
Kewaunee	5/11	07:55–16:50	Clo.	NW10	40–50	5	3	57
Mosquito Hill	5/25	06:30–16:30	P.Cl.	? 15	38–61	7	1	81
Manitowoc	5/22	04:00–21:30	P.Cl.	? ?	58–85	2	1	136
Winnebago	5/11	04:30–20:30	P.Cl.	N 10	38–53	26	12	180
Fond du Lac	5/11	?	P.Cl.	N 10	35–52	16	5	168
Sheboygan	5/18	05:00–17:00	P.Cl.	SW25	67–87	20	9	147
Horicon	5/11	?	?	?	?	14	?	124
Oconomowoc	5/12	04:30–20:00	P.Cl.	SW 5	34–55	15	5	137
Waukesha	5/19	04:30–17:00	Rain	SW20	70–85	26	9	140
Ozaukee/Milw.	5/18	02:00–20:00	Clo.	W ?	74–90	13	10	182
Racine/Kenosha	5/11	03:00–21:00	P.Cl.	NE15	34–49	24	13	168
Lake Geneva	5/14	06:30–17:30	Rain	NE 5	40–56	2	1	84
LaFarge	5/12	07:00–19:00	P.Cl.	? 8	40–45	5	2	88
Kenosha	5/11	05:00–21:00	P.Cl.	N 8	36–54	3	1	155

Table 2. Species seen on northern Wisconsin May Counts.

Species	Ashland	Burnett	Oxbo	Vilas	Clark	Marathon	Portage	Shawano	Oconto	Kewaunee	Mosquito Hill
Common Loon	x	x	x	x		x			x		
Pied-Billed Grebe	x	x		x	x	x	x	x	x	x	
Horned Grebe						x			x		
Red-necked Grebe		x									
American White Pelican									x		
Double-crested Cormorant	x	x			x	x	x		x	x	
American Bittern		x	x	x	x	x		x	x		
Least Bittern											
Great Blue Heron	x	x	x	x	x	x	x	x	x	x	x
Great Egret									x		
Snowy Egret											
Cattle Egret											
Green Heron	x	x				x	x	x	x		x
Black-crowned Night-Heron									x		
Tundra Swan	x				x				x		
Trumpeter Swan		x		x		x					
Mute Swan	x						x				
swan (species?)											
Snow Goose											
Canada Goose	x	x	x	x	x	x	x	x	x	x	x
Wood Duck	x	x		x	x	x	x	x	x		x
Green-winged Teal	x	x			x	x	x	x	x		
American Black Duck	x					x					
Mallard	x	x	x	x	x	x	x	x	x	x	x
Northern Pintail						x	x	x	x		
Blue-winged Teal	x	x		x	x	x	x	x	x	x	x
Northern Shoveler	x				x	x	x		x		
Gadwall	x					x	x	x	x		
American Wigeon	x	x		x		x	x	x			
Canvasback	x					x					
Redhead	x					x			x		
Ring-necked Duck	x	x		x		x	x	x	x		

Greater Scaup	x						x			x		
Lesser Scaup	x	x		x	x	x	x	x				
Oldsquaw									x			
Common Goldeneye	x					x						
Bufflehead	x			x	x	x	x	x	x	x		
Hooded Merganser					x	x	x	x	x		x	
Common Merganser	x	x	x		x		x					
Red-breasted Merganser	x				x		x		x			
merganser (sp.)												
Ruddy Duck	x											
Turkey Vulture	x				x	x	x	x	x			
Osprey	x	x	x			x	x	x	x		x	
Bald Eagle	x	x	x	x	x	x		x	x			
Northern Harrier	x	x	x		x	x	x	x	x	x		
Sharp-shinned Hawk	x	x	x		x	x		x	x			
Cooper's Hawk	x				x	x	x				x	
Northern Goshawk	x						x		x			
Red-shouldered Hawk	x						x		x		x	
Broad-winged Hawk	x	x			x	x	x	x	x			
Red-tailed Hawk	x	x			x	x	x	x	x	x	x	
Rough-legged Hawk			x		x	x	x					
American Kestrel	x			x	x	x	x	x	x	x		
Merlin	x	x				x						
Peregrine Falcon												
Gray Patridge												
Ring-necked Pheasant	x	x	x			x						
Ruffed Grouse	x	x	x	x	x	x	x	x	x	x		
Greater Prairie-Chicken					x	x	x					
Sharp-tailed Grouse	x	x										
Wild Turkey					x	x	x	x	x	x		
Northern Bobwhite												
Yellow Rail				x				x				
King Rail												
Virginia Rail	x	x		x			x	x	x			
Sora	x	x			x	x	x	x	x			
Common Moorhen									x			

(continued)

Table 2. *Continued*

Species	Ashland	Burnett	Oxbo	Vilas	Clark	Marathon	Portage	Shawano	Oconto	Kewaunee	Mosquito Hill
American Coot	x	x			x	x	x	x	x		
Sandhill Crane		x	x		x	x	x	x	x	x	x
Black-bellied Plover	x										
American Golden Plover											
Semipalmated Plover	x										
Killdeer	x	x	x	x	x	x	x	x	x	x	
American Avocet			x								
Greater Yellowlegs	x		x		x	x	x	x	x	x	
Lesser Yellowlegs					x	x	x	x	x	x	
Solitary Sandpiper	x				x	x	x		x		
Spotted Sandpiper	x	x		x	x	x	x	x	x		
Upland Sandpiper	x	x					x		x		
Ruddy Turnstone	x										
Sanderling	x										
Semipalmated Sandpiper	x							x	x		
Least Sandpiper	x					x		x			
White-rumped Sandpiper						x		x			
Baird's Sandpiper	x										
Pectoral Sandpiper									x		
Dunlin	x								x		
Short-billed Dowitcher						x		x	x		
Common Snipe	x	x	x	x	x	x	x	x	x		
American Woodcock	x	x	x	x	x	x	x	x	x		
Wilson's Phalarope									x		
Red-necked Phalarope											
Little Gull											
Bonaparte's Gull	x				x				x	x	
Ring-billed Gull	x	x				x	x		x	x	
Herring Gull	x				x	x		x	x		
Glaucous Gull											
Caspian Tern	x	x							x	x	
Common Tern	x	x							x		

Forster's Tern	x								x		
Black Tern		x			x	x	x		x		
Rock Dove	x	x	x	x	x	x	x	x	x	x	x
Mourning Dove	x	x	x	x	x	x	x	x	x	x	x
Black-billed Cuckoo									x		
Yellow-billed Cuckoo	x										
cuckoo (sp.)											
Eastern Screech-Owl						x					
Great Horned Owl	x	x		x	x	x		x	x		
Barred Owl		x		x		x	x	x	x		
Great Gray Owl	x										
Long-eared Owl									x		
Short-eared Owl											
Northern Saw-whet Owl											
Common Nighthawk	x	x	x						x		x
Whip-poor-will	x	x		x		x	x	x	x		
Chimney Swift	x	x		x		x	x	x	x		x
Ruby-throated Hummingbird	x	x	x	x		x			x		x
Belted Kingfisher	x	x			x	x	x	x	x	x	
Red-headed Woodpecker			x		x	x	x	x	x		
Red-bellied Woodpecker		x	x		x	x	x	x	x		x
Yellow-bellied Sapsucker	x		x	x	x	x	x	x	x		
Downy Woodpecker	x	x	x	x	x	x	x	x	x	x	x
Hairy Woodpecker	x		x	x	x	x	x	x	x		x
Black-backed Woodpecker				x							
Northern Flicker	x	x	x	x	x	x	x	x	x	x	x
Pileated Woodpecker	x		x	x	x	x	x	x	x		x
Olive-sided Flycatcher											
Eastern Wood-Pewee	x				x		x	x	x		x
Yellow-bellied Flycatcher				x		x			x		
Acadian Flycatcher											
Alder Flycatcher											
Willow Flycatcher											
Least Flycatcher	x	x		x		x	x		x		x
Eastern Phoebe	x	x	x	x	x	x	x	x	x	x	x
Great Crested Flycatcher	x								x		x

(continued)

Table 2. *Continued*

Species	Ashland	Burnett	Oxbo	Vilas	Clark	Marathon	Portage	Shawano	Oconto	Kewaunee	Mosquito Hill
Eastern Kingbird	x	x	x	x	x	x	x	x	x	x	x
Horned Lark		x			x	x	x		x	x	
Purple Martin	x	x	x			x		x	x	x	
Tree Swallow	x	x		x	x	x	x	x	x	x	x
Northern Rough-winged Swallow	x			x	x	x	x	x	x		x
Bank Swallow	x	x		x	x	x			x		
Cliff Swallow	x	x		x	x	x	x	x	x	x	
Barn Swallow	x	x	x	x	x	x	x	x	x	x	x
Gray Jay			x	x							
Blue Jay	x	x	x	x	x	x	x	x	x	x	x
American Crow	x	x	x	x	x	x	x	x	x	x	x
Northern Raven	x	x	x	x	x	x	x	x	x		
Black-capped Chickadee	x	x	x	x	x	x	x	x	x	x	x
Boreal Chickadee				x							
Tufted Titmouse											
Red-breasted Nuthatch	x		x	x	x	x	x	x	x		x
White-breasted Nuthatch	x	x	x		x	x	x	x	x	x	x
Brown Creeper	x				x	x	x		x		
House Wren	x	x	x	x		x	x	x	x	x	x
Winter Wren	x	x		x	x	x		x	x		
Sedge Wren	x	x		x	x	x		x	x	x	
Marsh Wren		x			x	x			x	x	
Golden-crowned Kinglet	x			x		x	x		x		
Ruby-crowned Kinglet	x	x		x	x	x	x	x	x	x	
Blue-gray Gnatcatcher									x		x
Eastern Bluebird	x	x	x	x	x	x	x	x	x		x
Veery	x	x		x	x	x		x	x		x
Gray-cheeked Thrush	x			x			x		x		
Swainson's Thrush	x	x		x		x	x		x		x
Hermit Thrush	x	x	x	x		x			x		
Wood Thrush	x	x			x	x	x		x		x
American Robin	x	x	x	x	x	x	x	x	x	x	x

Gray Catbird	x	x	x	x	x	x	x	x	x		x
Northern Mockingbird	x										
Brown Thrasher	x	x	x	x	x	x	x	x	x		x
American Pipit	x						x				
Cedar Waxwing						x			x		x
Northern Shrike											
European Starling	x	x	x	x	x	x	x	x	x	x	x
White-eyed Vireo											
Solitary Vireo	x			x		x			x		x
Yellow-throated Vireo		x							x		x
Warbling Vireo	x			x		x			x		
Philadelphia Vireo											
Red-eyed Vireo	x	x		x					x		x
Blue-winged Warbler									x		
Golden-winged Warbler		x							x		
Tennessee Warbler				x					x		
Orange-crowned Warbler	x				x		x				
Nashville Warbler	x	x		x	x	x			x		
Northern Parula	x			x		x			x		
Yellow Warbler	x	x		x	x	x	x	x	x		
Chestnut-sided Warbler	x	x		x	x				x		x
Magnolia Warbler	x			x					x		x
Cape May Warbler	x	x		x			x	x	x		
Black-throated Blue Warbler	x			x							
Yellow-rumped Warbler	x	x	x	x	x	x	x	x	x	x	x
Black-throated Green Warbler	x	x		x		x	x	x	x		x
Blackburnian Warbler	x			x			x		x		x
Yellow-throated Warbler											
Pine Warbler	x	x		x	x	x	x	x	x		
Palm Warbler	x	x		x	x	x	x	x	x	x	x
Bay-breasted Warbler	x			x					x		x
Blackpoll Warbler	x	x							x		
Cerulean Warbler									x		
Black-and-white Warbler	x	x		x	x	x	x	x	x	x	
American Redstart	x	x		x		x	x		x		x
Prothonotary Warbler											

(continued)

Table 2. *Continued*

Species	Ashland	Burnett	Oxbo	Vilas	Clark	Marathon	Portage	Shawano	Oconto	Kewaunee	Mosquito Hill
Worm-eating Warbler											
Ovenbird	x	x	x	x	x	x	x	x	x		x
Northern Waterthrush	x	x			x	x	x	x	x		
Louisiana Waterthrush								x			
Kentucky Warbler											
Connecticut Warbler				x					x		
Mourning Warbler	x			x					x		x
Common Yellowthroat	x	x		x		x		x	x		
Hooded Warbler											
Wilson's Warbler	x	x							x		x
Canada Warbler	x			x					x		x
Summer Tanager											
Scarlet Tanager			x	x					x		x
Northern Cardinal	x	x	x		x	x	x	x	x	x	x
Rose-breasted Grosbeak	x	x	x	x	x	x	x	x	x		x
Indigo Bunting	x	x	x	x	x				x		x
Dickcissel							x				
Eastern Towhee	x	x	x		x	x	x	x	x	x	x
American Tree Sparrow					x	x			x		
Chipping Sparrow	x	x	x	x	x	x	x	x	x	x	x
Clay-colored Sparrow	x	x		x	x	x	x	x	x		
Field Sparrow		x			x	x		x	x	x	x
Vesper Sparrow	x	x			x	x	x	x	x		x
Savannah Sparrow	x	x		x	x	x	x	x	x	x	x
Grasshopper Sparrow					x	x	x		x		
Henslow's Sparrow						x			x		
Le Conte's Sparrow		x				x			x		
Fox Sparrow					x	x					
Song Sparrow	x	x	x	x	x	x	x	x	x	x	x
Lincoln's Sparrow				x	x		x				
Swamp Sparrow	x	x		x	x	x	x	x	x		
White-throated Sparrow	x	x	x	x	x	x	x	x	x	x	x

White-crowned Sparrow	x		x		x	x	x	x	x	x	
Harris' Sparrow	x		x								
Dark-eyed Junco	x		x		x	x			x		
Lapland Longspur											
Bobolink	x	x		x	x	x	x	x	x	x	
Red-winged Blackbird	x	x	x	x	x	x	x	x	x	x	x
Eastern Meadowlark	x	x			x	x	x	x	x	x	x
Western Meadowlark	x	x				x	x				
Yellow-headed Blackbird		x				x	x		x		
Rusty Blackbird											
Brewer's Blackbird	x	x	x		x	x	x	x	x		
Common Grackle	x	x	x	x	x	x	x	x	x	x	x
Brown-headed Cowbird	x	x	x	x	x	x	x	x	x	x	x
Orchard Oriole									x		
Baltimore Oriole	x	x	x	x	x	x	x	x	x		x
Purple Finch	x		x	x	x	x	x	x	x		
House Finch	x	x	x	x	x	x	x	x	x	x	x
Red Crossbill				x			x				
White-winged Crossbill											
Pine Siskin	x		x	x		x	x	x	x		
American Goldfinch	x	x	x	x	x	x	x	x	x	x	x
Evening Grosbeak	x		x	x	x			x	x		
House Sparrow	x	x			x	x	x	x	x	x	x
Total Species	170	121	71	110	120	151	130	114	185	57	81

Table 3. Species seen on southern Wisconsin May Counts.

Species	Manitowoc	Winnebago	Fond du Lac	Sheboygan	Horicon	Oconomowoc	Waukesha	Ozaukee/ Milwaukee	Racine/ Kenosha	Lake Geneva	Lafarge	Kenosha
Common Loon		x	x					x	x			x
Pied-Billed Grebe		x	x	x	x	x	x	x	x	x		x
Horned Grebe		x	x		x							x
Red-necked Grebe		x										
American White Pelican		x			x							
Double-crested Cormorant	x	x	x	x	x	x	x	x	x			x
American Bittern	x	x	x		x				x			x
Least Bittern		x	x		x			x				x
Great Blue Heron	x	x	x	x	x	x	x	x	x	x	x	x
Great Egret		x	x		x	x	x	x	x			x
Snowy Egret									x			
Cattle Egret		x						x				
Green Heron	x	x	x	x	x	x	x	x	x	x	x	x
Black-crowned Night-Heron	x	x			x				x			
Tundra Swan			x						x			
Trumpeter Swan												
Mute Swan			x	x			x		x			x
swan (species?)		x										
Snow Goose									x			
Canada Goose	x	x	x	x	x	x	x	x	x	x	x	x
Wood Duck	x	x	x	x	x	x	x	x	x	x	x	x
Green-winged Teal	x	x	x			x			x			
American Black Duck	x	x		x	x				x			
Mallard	x	x	x	x	x	x	x	x	x	x	x	x
Northern Pintail		x			x				x			
Blue-winged Teal	x	x	x	x	x	x	x	x	x	x	x	x
Northern Shoveler	x	x	x		x	x	x	x	x	x		x
Gadwall		x	x		x	x		x				
American Wigeon		x	x	x				x				x
Canvasback		x	x		x							x
Redhead		x	x	x	x			x	x			x
Ring-necked Duck		x	x	x	x	x	x	x	x	x		x
Greater Scaup		x				x		x	x			x
Lesser Scaup		x	x		x	x		x	x			
Oldsquaw												
Common Goldeneye		x						x	x			x
Bufflehead		x				x		x	x			x

Hooded Merganser		x	x	x		x		x	x				
Common Merganser		x	x	x								x	
Red-breasted Merganser		x	x	x				x	x			x	
merganser (sp.)													
Ruddy Duck		x			x	x		x	x				
Turkey Vulture		x	x	x	x	x	x	x	x	x	x	x	
Osprey		x	x	x		x		x	x		x	x	
Bald Eagle		x									x		
Northern Harrier		x	x	x	x	x	x	x	x	x	x	x	
Sharp-shinned Hawk		x	x	x	x		x	x	x		x	x	
Cooper's Hawk	x	x	x	x	x	x	x	x	x	x	x		
Northern Goshawk													
Red-shouldered Hawk			x	x			x	x					
Broad-winged Hawk	x	x	x	x		x		x	x			x	
Red-tailed Hawk	x	x	x	x	x	x	x	x	x	x	x	x	
Rough-legged Hawk		x							x			x	
American Kestrel		x	x	x	x	x	x	x	x	x	x	x	
Merlin		x			x			x					
Peregrine Falcon				x	x			x	x				
Gray Partridge												x	
Ring-necked Pheasant	x	x	x	x	x	x	x	x	x		x	x	
Ruffed Grouse	x		x					x			x		
Greater Prairie-Chicken													
Sharp-tailed Grouse													
Wild Turkey	x	x	x	x		x	x			x	x		
Northern Bobwhite											x	x	
Yellow Rail													
King Rail			x		x								
Virginia Rail		x	x		x			x	x			x	
Sora	x	x	x	x	x	x	x	x	x		x	x	
Common Moorhen		x	x		x		x					x	
American Coot		x	x	x	x	x	x	x	x	x	x	x	
Sandhill Crane	x	x	x	x	x	x	x	x	x	x	x	x	
Black-bellied Plover								x	x			x	
American Golden Plover												x	
Semipalmated Plover								x					
Killdeer	x	x	x	x	x	x	x	x	x	x	x	x	
American Avocet													
Greater Yellowlegs		x	x	x		x			x			x	
Lesser Yellowlegs	x	x	x		x	x		x	x				
Solitary Sandpiper		x	x			x	x		x	x		x	

(continued)

Table 3. *Continued*

Species	Manitowoc	Winnebago	Fond du Lac	Sheboygan	Horicon	Oconomowoc	Waukesha	Ozaukee/ Milwaukee	Racine/ Kenosha	Lake Geneva	Lafarge	Kenosha
Spotted Sandpiper	x	x	x	x	x	x	x	x	x		x	x
Upland Sandpiper		x							x			
Ruddy Turnstone		x	x	x				x	x			x
Sanderling		x										x
Semipalmated Sandpiper			x									x
Least Sandpiper		x	x		x			x	x			
White-rumped Sandpiper								x				
Baird's Sandpiper												
Pectoral Sandpiper		x				x		x	x			
Dunlin		x		x	x			x				x
Short-billed Dowitcher		x	x						x			
Common Snipe		x	x			x	x		x		x	x
American Woodcock	x	x	x		x	x		x	x		x	x
Wilson's Phalarope			x									
Red-necked Phalarope		x										
Little Gull								x				
Bonaparte's Gull	x	x	x	x				x	x			x
Ring-billed Gull	x	x	x	x	x	x		x	x			x
Herring Gull	x	x	x	x				x	x			x
Glaucous Gull												x
Caspian Tern	x	x		x				x	x			x
Common Tern	x	x	x	x			x	x	x	x		x
Arctic Tern												
Forster's Tern	x	x	x		x		x	x	x			x
Black Tern		x	x		x		x	x	x	x		x
Rock Dove	x	x	x	x	x	x	x	x	x	x	x	x
Mourning Dove	x	x	x	x	x	x	x	x	x	x	x	x
Black-billed Cuckoo							x	x				
Yellow-billed Cuckoo								x				
cuckoo (sp.)												
Eastern Screech-Owl	x	x	x						x		x	
Great Horned Owl	x	x	x		x	x	x	x	x		x	x
Barred Owl		x	x	x		x		x			x	
Great Gray Owl												
Long-eared Owl												
Short-eared Owl												
Northern Saw-whet Owl												

Common Nighthawk	x			x	x		x	x			x	x
Whip-poor-will	x					x		x			x	x
Chimney Swift	x	x	x	x	x	x	x	x	x		x	x
Ruby-throated Hummingbird	x			x		x	x	x	x		x	
Belted Kingfisher	x	x	x	x	x	x	x	x	x	x	x	x
Red-headed Woodpecker		x		x			x	x	x		x	x
Red-bellied Woodpecker	x	x	x	x	x	x	x	x	x	x	x	x
Yellow-bellied Sapsucker			x								x	x
Downy Woodpecker	x	x	x	x	x	x	x	x	x	x	x	x
Hairy Woodpecker	x	x	x	x	x	x	x	x	x		x	x
Black-backed Woodpecker												
Northern Flicker	x	x	x	x	x	x	x	x	x	x	x	x
Pileated Woodpecker		x	x								x	
Olive-sided Flycatcher	x					x		x				
Eastern Wood-Pewee	x	x	x	x		x	x	x	x			x
Yellow-bellied Flycatcher	x		x	x				x				
Acadian Flycatcher				x			x					
Alder Flycatcher	x							x				
Willow Flycatcher	x				x		x					
Least Flycatcher	x	x	x	x	x	x	x	x	x			x
Eastern Phoebe	x	x	x	x	x	x	x	x	x	x	x	x
Great Crested Flycatcher	x	x	x	x	x	x	x	x	x	x		x
Eastern Kingbird	x	x	x	x	x	x	x	x	x	x	x	x
Horned Lark	x	x	x	x		x		x	x		x	x
Purple Martin	x	x	x	x		x	x	x	x			x
Tree Swallow	x	x	x	x	x	x	x	x	x	x	x	x
Northern Rough-winged Swallow	x	x	x	x	x	x	x	x	x		x	x
Bank Swallow	x	x	x	x	x	x	x	x	x			x
Cliff Swallow	x	x	x	x	x	x	x	x	x			x
Barn Swallow	x	x	x	x	x	x	x	x	x	x	x	x
Gray Jay												
Blue Jay	x	x	x	x	x	x	x	x	x	x	x	x
American Crow	x	x	x	x	x	x	x	x	x	x	x	x
Northern Raven												
Black-capped Chickadee	x	x	x	x	x	x	x	x	x	x	x	x
Boreal Chickadee												
Tufted Titmouse						x						
Red-breasted Nuthatch	x	x	x	x	x	x	x	x	x	x	x	x
White-breasted Nuthatch	x	x	x	x	x	x	x	x	x	x	x	x
Brown Creeper	x	x	x	x		x		x	x			x
House Wren	x	x	x	x	x	x	x	x	x	x	x	x

(continued)

Table 3. *Continued*

Species	Manitowoc	Winnebago	Fond du Lac	Sheboygan	Horicon	Oconomowoc	Waukesha	Ozaukee/ Milwaukee	Racine/ Kenosha	Lake Geneva	Lafarge	Kenosha
Winter Wren	x	x	x	x				x	x			
Sedge Wren	x	x		x			x	x		x		
Marsh Wren	x	x		x			x	x	x			
Golden-crowned Kinglet			x	x		x	x		x			
Ruby-crowned Kinglet	x	x	x	x	x	x	x	x	x	x		x
Blue-gray Gnatcatcher	x	x	x	x	x	x	x	x	x	x		x
Eastern Bluebird	x	x	x	x	x	x	x	x	x	x	x	x
Veery	x	x	x	x	x	x	x	x	x	x		x
Gray-cheeked Thrush		x	x	x	x	x		x	x			x
Swainson's Thrush	x	x	x	x	x	x	x	x	x	x		x
Hermit Thrush		x	x	x	x	x	x		x			x
Wood Thrush	x	x	x	x	x	x	x	x	x	x	x	x
American Robin	x	x	x	x	x	x	x	x	x	x	x	x
Gray Catbird	x	x	x	x	x	x	x	x	x	x	x	x
Northern Mockingbird												
Brown Thrasher	x	x	x	x		x	x	x	x	x	x	x
American Pipit				x					x			
Cedar Waxwing	x	x		x	x	x	x	x	x		x	
Northern Shrike					x							
European Starling	x	x	x	x	x	x	x	x	x	x	x	x
White-eyed Vireo											x	
Solitary Vireo		x	x	x	x		x	x	x			
Yellow-throated Vireo			x	x		x		x	x	x		
Warbling Vireo	x	x		x	x		x	x	x			
Philadelphia Vireo	x			x			x	x				
Red-eyed Vireo	x	x		x			x	x				
Blue-winged Warbler		x		x		x	x	x	x		x	x
Golden-winged Warbler	x		x	x		x	x	x	x			x
Tennessee Warbler	x	x		x			x	x	x			
Orange-crowned Warbler	x			x		x		x	x			
Nashville Warbler	x	x	x	x	x	x	x	x	x			
Northern Parula	x	x	x	x	x	x		x	x			x
Yellow Warbler	x	x	x	x		x	x	x	x	x	x	x
Chestnut-sided Warbler	x	x	x	x		x	x	x	x	x		x
Magnolia Warbler	x	x	x	x		x	x	x	x			x
Cape May Warbler	x	x	x	x		x	x	x	x			x
Black-throated Blue Warbler	x		x	x		x	x	x	x			x

Yellow-rumped Warbler	x	x	x	x	x	x	x	x	x	x	x	x
Black-throated Green Warbler	x	x	x	x	x	x	x	x	x	x		x
Blackburnian Warbler	x	x	x	x	x		x	x	x			x
Yellow-throated Warbler				x								
Pine Warbler	x		x			x	x			x		
Palm Warbler	x	x	x	x	x	x	x	x	x	x		x
Bay-breasted Warbler	x	x		x			x	x				x
Blackpoll Warbler	x	x	x	x			x	x				x
Cerulean Warbler	x		x	x			x	x				x
Black-and-white Warbler	x	x	x	x	x	x	x	x	x	x	x	x
American Redstart	x	x	x	x	x	x	x	x	x	x		x
Prothonotary Warbler		x				x	x					x
Worm-eating Warbler												
Ovenbird	x	x	x	x	x	x	x	x	x	x		x
Northern Waterthrush	x	x	x	x	x	x	x	x	x		x	x
Louisiana Waterthrush			x					x				x
Kentucky Warbler			x				x	x				
Connecticut Warbler		x		x	x			x				x
Mourning Warbler	x		x	x			x	x				
Common Yellowthroat	x	x	x	x	x	x	x	x	x	x		x
Hooded Warbler								x				
Wilson's Warbler	x	x	x	x			x	x	x			x
Canada Warbler	x	x		x			x	x				x
Summer Tanager								x				
Scarlet Tanager	x			x	x	x	x	x	x	x		
Northern Cardinal	x	x	x	x	x	x	x	x	x	x	x	x
Rose-breasted Grosbeak	x	x	x	x	x	x	x	x	x	x	x	x
Indigo Bunting	x	x	x	x	x	x	x	x	x	x	x	x
Dickcissel					x			x				
Eastern Towhee	x	x	x	x		x	x	x	x	x	x	x
American Tree Sparrow					x						x	x
Chipping Sparrow	x	x	x	x	x	x	x	x	x	x	x	x
Clay-colored Sparrow	x		x			x		x				
Field Sparrow		x	x	x	x	x	x	x	x	x	x	
Vesper Sparrow	x	x	x	x	x		x	x	x			x
Savannah Sparrow	x	x	x	x	x	x	x	x	x	x		x
Grasshopper Sparrow	x					x	x	x				
Henslow's Sparrow			x				x		x			
Le Conte's Sparrow												
Fox Sparrow		x	x	x		x			x		x	
Song Sparrow	x	x	x	x	x	x	x	x	x	x	x	x

(continued)

Table 3. *Continued*

Species	Manitowoc	Winnebago	Fond du Lac	Sheboygan	Horicon	Oconomowoc	Waukesha	Ozaukee/ Milwaukee	Racine/ Kenosha	Lake Geneva	Lafarge	Kenosha
Lincoln's Sparrow	x	x	x				x		x			
Swamp Sparrow	x	x	x	x	x	x	x	x	x	x		x
White-throated Sparrow	x	x	x	x	x	x	x	x	x	x	x	x
White-crowned Sparrow	x	x	x	x	x	x	x	x	x	x	x	x
Harris' Sparrow									x			
Dark-eyed Junco		x	x		x	x		x	x			x
Lapland Longspur		x						x				
Bobolink	x	x	x	x	x	x	x	x	x	x	x	x
Red-winged Blackbird	x	x	x	x	x	x	x	x	x	x	x	x
Eastern Meadowlark	x	x	x	x		x	x	x	x	x	x	x
Western Meadowlark		x	x			x	x	x				
Yellow-headed Blackbird	x	x	x		x	x	x		x			x
Rusty Blackbird		x	x									
Brewer's Blackbird	x	x			x	x			x			x
Common Grackle	x	x	x	x	x	x	x	x	x	x	x	x
Brown-headed Cowbird	x	x	x	x	x	x	x	x	x	x	x	x
Orchard Oriole				x			x					
Baltimore Oriole	x	x	x	x		x	x	x	x	x	x	x
Purple Finch	x	x	x	x		x		x	x	x	x	
House Finch	x	x	x	x	x	x	x	x	x	x	x	x
Red Crossbill												
White-winged Crossbill		x										
Pine Siskin		x	x	x	x	x	x	x	x	x		x
American Goldfinch	x	x	x	x	x	x	x	x	x	x	x	x
Evening Grosbeak			x	x					x			
House Sparrow	x	x	x	x	x	x	x	x	x	x	x	x
Total Species	136	180	168	147	124	137	140	182	168	84	88	155

Table 4. Totals for state by year.

Species	1996	1995	1994	1993	1992	1991	1990	1989
Common Loon	11	8	7	9	9	5	8	11
Pied-Billed Grebe	19	14	17	17	20	13	16	15
Horned Grebe	6	0	0	0	0	0	0	0
Red-necked Grebe	2	2	3	2	2	3	4	1
American White Pelican	3	1	0	0	1	0	0	0
Double-crested Cormorant	17	14	14	14	12	12	8	11
American Bittern	13	11	10	16	17	13	15	16
Least Bittern	5	2	4	5	5	4	4	3
Great Blue Heron	23	19	22	24	24	21	22	22
Great Egret	9	5	7	11	10	7	10	11
Snowy Egret	1	1	1	0	0	1	0	0
Cattle Egret	2	2	1	4	1	0	2	1
Green Heron	19	13	16	20	20	21	19	21
Black-crowned Night-Heron	5	6	7	7	6	7	8	8
Tundra Swan	5	2	1	0	3	0	2	4
Trumpeter Swan	3	2	2	3	1	1	1	0
Mute Swan	7	3	7	5	5	3	4	7
swan (species?)	1	0	0	0	0	0	0	0
Snow Goose	1	1	3	0	0	0	2	1
Canada Goose	23	19	20	23	22	20	21	19
Wood Duck	21	18	21	22	24	20	22	21
Green-winged Teal	12	9	10	13	13	10	11	10
American Black Duck	7	5	8	7	9	7	6	5
Mallard	23	19	22	24	24	22	21	22
Northern Pintail	7	3	4	7	7	6	5	0
Blue-winged Teal	22	18	20	22	23	21	22	20
Northern Shoveler	15	10	11	14	14	14	14	10
Gadwall	10	7	6	8	8	4	7	9
American Wigeon	11	7	8	8	6	8	8	11
Canvasback	6	3	2	2	5	1	4	3
Redhead	10	6	4	6	7	5	5	9
Ring-necked Duck	17	8	11	10	10	7	8	9
Greater Scaup	8	2	0	6	6	1	2	1
Lesser Scaup	13	10	6	9	9	9	12	8
Oldsquaw	1	1	0	1	0	0	0	0
Common Goldeneye	6	3	2	3	5	1	3	5
Bufflehead	13	2	6	7	5	3	7	6
Hooded Merganser	12	9	9	9	9	7	7	8
Common Merganser	9	7	6	6	5	4	3	4
Red-breasted Merganser	10	5	7	7	4	2	5	5
merganser (sp.)	0	1	0	0	0	0	0	0
Ruddy Duck	6	6	8	7	9	7	10	10
Turkey Vulture	17	14	14	16	19	15	11	16
Osprey	16	10	6	15	13	8	7	11
Bald Eagle	10	11	9	11	10	8	7	5
Northern Harrier	20	18	19	21	18	12	15	14
Sharp-shinned Hawk	16	8	10	14	17	7	9	10
Cooper's Hawk	16	8	12	11	9	7	9	12
Northern Goshawk	3	3	2	2	3	2	1	1
Red-shouldered Hawk	8	4	6	2	5	5	5	5
Broad-winged Hawk	15	11	14	17	18	11	11	13
Red-tailed Hawk	21	17	22	22	24	21	20	21
Rough-legged Hawk	7	4	2	1	3	3	6	1
American Kestrel	19	19	18	24	24	22	21	21

(continued)

Table 4. *Continued*

Species	1996	1995	1994	1993	1992	1991	1990	1989
Merlin	6	3	2	2	2	2	3	3
Peregrine Falcon	4	1	3	3	0	2	1	0
Gray Partridge	1	0	0	0	0	0	0	0
Ring-necked Pheasant	15	13	15	17	13	13	15	13
Ruffed Grouse	14	13	14	14	14	14	14	16
Greater Prairie-Chicken	3	2	2	3	3	2	2	4
Sharp-tailed Grouse	2	1	2	2	3	2	2	2
Wild Turkey	14	9	9	9	7	5	4	3
Northern Bobwhite	2	1	4	2	2	2	2	0
Yellow Rail	2	0	0	0	0	0	0	0
King Rail	2	4	2	2	1	1	2	2
Virginia Rail	12	8	12	10	8	5	7	8
Sora	18	14	17	18	23	15	20	15
Common Moorhen	6	3	5	6	4	4	4	4
American Coot	18	9	12	15	16	13	17	15
Sandhill Crane	21	14	19	22	23	18	18	18
Black-bellied Plover	4	3	5	3	4	1	4	5
American Golden Plover	1	1	2	0	1	0	0	1
Semipalmated Plover	2	5	12	8	13	7	6	11
Killdeer	22	19	22	24	24	21	21	21
American Avocet	1	0	0	0	0	0	0	0
Greater Yellowlegs	14	12	10	9	13	8	13	10
Lesser Yellowlegs	13	12	9	14	12	7	14	13
Solitary Sandpiper	12	6	12	13	10	10	13	9
Spotted Sandpiper	19	18	19	21	21	18	18	19
Upland Sandpiper	6	3	5	6	6	6	6	8
Ruddy Turnstone	7	4	6	4	3	3	2	6
Sanderling	3	2	2	2	3	1	3	2
Semipalmated Sandpiper	5	6	12	2	9	6	6	8
Least Sandpiper	8	11	14	14	16	9	12	13
White-rumped Sandpiper	3	4	3	1	2	3	0	2
Baird's Sandpiper	1	2	4	2	2	1	1	2
Pectoral Sandpiper	5	2	7	3	6	4	9	7
Dunlin	7	11	11	7	9	9	4	8
Short-billed Dowitcher	6	6	6	5	8	6	5	6
Common Snipe	16	15	17	19	18	15	19	17
American Woodcock	18	14	15	21	17	10	18	11
Wilson's Phalarope	2	3	6	5	4	6	10	4
Red-necked Phalarope	1	0	0	0	0	0	0	0
Little Gull	1	2	0	0	0	0	1	2
Bonaparte's Gull	11	8	10	10	8	7	7	7
Ring-billed Gull	16	14	16	19	17	19	14	14
Herring Gull	12	13	15	16	9	7	9	10
Glaucous Gull	1	1	0	1	1	0	1	0
Caspian Tern	10	5	9	9	6	5	7	7
Common Tern	12	8	11	12	9	7	10	10
Forster's Tern	10	7	12	9	9	10	14	7
Black Tern	13	13	15	17	19	16	16	17
Rock Dove	23	19	21	24	23	22	21	22
Mourning Dove	23	19	22	24	24	22	22	23
Black-billed Cuckoo	3	2	7	10	11	10	8	14
Yellow-billed Cuckoo	2	1	2	0	0	3	3	6
cuckoo (sp.)	0	1	0	0	0	0	0	0
Eastern Screech-Owl	6	3	8	6	3	3	5	5

(continued)

Table 4. *Continued*

Species	1996	1995	1994	1993	1992	1991	1990	1989
Great Horned Owl	17	14	14	17	19	11	16	15
Barred Owl	12	12	10	12	14	6	12	10
Great Gray Owl	1	0	0	0	0	0	0	0
Long-eared Owl	1	0	0	0	0	0	0	0
Short-eared Owl	0	1	1	1	1	2	0	0
Northern Saw-whet Owl	0	1	1	2	2	1	0	1
Common Nighthawk	12	8	11	14	9	13	9	16
Whip-poor-will	12	9	8	13	7	8	8	12
Chimney Swift	19	19	21	22	22	20	20	22
Ruby-throated Hummingbird	14	14	16	18	16	15	13	14
Belted Kingfisher	20	16	17	21	23	17	18	21
Red-headed Woodpecker	13	12	16	21	20	17	19	21
Red-bellied Woodpecker	20	15	16	18	19	16	17	20
Yellow-bellied Sapsucker	11	12	12	12	11	8	10	10
Downy Woodpecker	23	18	19	23	23	22	21	23
Hairy Woodpecker	20	17	22	23	22	19	21	21
Black-backed Woodpecker	1	2	1	1	1	0	1	0
Northern Flicker	23	19	22	24	24	22	22	22
Pileated Woodpecker	12	10	10	9	11	9	10	9
Olive-sided Flycatcher	3	3	5	5	4	4	9	3
Eastern Wood-Pewee	15	8	14	19	10	13	13	16
Yellow-bellied Flycatcher	7	3	5	3	3	1	1	3
Acadian Flycatcher	2	0	0	0	0	0	0	0
Alder Flycatcher	2	6	6	5	2	2	1	8
Willow Flycatcher	3	7	5	2	2	5	5	9
Least Flycatcher	17	14	20	19	21	18	20	19
Eastern Phoebe	23	17	21	21	23	19	20	19
Great Crested Flycatcher	14	18	20	22	24	20	21	21
Eastern Kingbird	23	18	20	23	23	22	21	21
Horned Lark	15	16	19	21	21	17	18	19
Purple Martin	16	14	19	20	23	19	19	21
Tree Swallow	23	19	22	24	24	22	22	21
Northern Rough-winged Swallow	19	18	17	21	24	17	20	21
Bank Swallow	16	16	17	19	20	16	14	16
Cliff Swallow	19	17	20	21	16	13	16	16
Barn Swallow	23	19	22	24	24	22	21	22
Gray Jay	2	2	2	1	2	0	1	1
Blue Jay	23	19	22	24	24	22	22	23
American Crow	23	19	22	24	24	22	22	23
Northern Raven	9	10	9	8	8	8	5	8
Black-capped Chickadee	23	19	22	24	24	22	22	23
Boreal Chickadee	1	1	0	1	1	0	0	0
Tufted Titmouse	1	1	1	2	2	2	4	2
Red-breasted Nuthatch	21	9	17	14	12	7	15	10
White-breasted Nuthatch	22	18	21	24	24	22	21	23
Brown Creeper	13	9	6	10	8	6	0	13
House Wren	22	18	22	24	24	22	21	23
Winter Wren	13	10	11	12	10	7	5	9
Sedge Wren	14	11	14	16	17	13	16	10
Marsh Wren	11	12	17	15	16	11	14	7
Golden-crowned Kinglet	10	6	5	10	3	4	6	6
Ruby-crowned Kinglet	20	10	14	16	15	7	14	15
Blue-gray Gnatcatcher	13	12	15	14	15	14	14	15
Eastern Bluebird	22	18	22	23	24	21	22	21

(continued)

Table 4. *Continued*

Species	1996	1995	1994	1993	1992	1991	1990	1989
Veery	19	17	19	18	18	15	20	17
Gray-cheeked Thrush	12	8	5	9	8	7	10	4
Swainson's Thrush	18	12	14	17	14	13	14	11
Hermit Thrush	14	11	15	14	14	10	12	13
Wood Thrush	19	17	18	21	21	19	19	19
American Robin	23	19	22	24	24	22	22	23
Gray Catbird	22	18	22	24	23	22	21	23
Northern Mockingbird	1	0	0	0	0	0	0	0
Brown Thrasher	21	19	21	24	23	21	20	21
American Pipit	4	0	0	0	0	0	0	0
Cedar Waxwing	12	14	15	15	16	14	13	15
Northern Shrike	1	0	0	0	0	0	0	0
European Starling	23	18	22	24	23	22	22	23
White-eyed Vireo	1	0	0	0	0	0	0	0
Solitary Vireo	12	10	15	13	9	6	9	9
Yellow-throated Vireo	9	14	15	18	13	14	12	16
Warbling Vireo	11	16	18	21	22	20	19	16
Philadelphia Vireo	4	5	7	7	4	8	6	7
Red-eyed Vireo	10	14	19	22	19	21	17	19
Blue-winged Warbler	9	8	15	11	11	12	13	10
Golden-winged Warbler	10	13	18	14	14	9	13	16
Tennessee Warbler	8	14	18	18	18	16	15	17
Orange-crowned Warbler	8	2	6	8	3	4	7	9
Nashville Warbler	15	15	18	19	20	16	18	18
Northern Parula	13	9	10	10	12	4	9	10
Yellow Warbler	20	19	22	24	24	20	21	22
Chestnut-sided Warbler	16	17	21	24	20	18	17	18
Magnolia Warbler	13	16	17	19	17	16	19	16
Cape May Warbler	15	11	16	16	14	12	10	13
Black-throated Blue Warbler	10	8	9	6	7	4	2	7
Yellow-rumped Warbler	23	18	22	23	22	18	22	20
Black-throated Green Warbler	19	15	19	19	19	16	17	18
Blackburnian Warbler	14	15	20	19	19	14	16	13
Yellow-throated Warbler	1	0	0	0	0	0	0	0
Pine Warbler	13	12	12	9	6	8	6	9
Palm Warbler	21	13	15	21	22	12	19	17
Bay-breasted Warbler	10	11	14	15	13	12	13	14
Blackpoll Warbler	10	10	13	11	9	14	10	11
Cerulean Warbler	7	3	3	6	7	7	3	8
Black-and-white Warbler	21	18	21	19	19	16	20	21
American Redstart	18	18	20	22	21	18	19	20
Prothonotary Warbler	4	3	2	6	1	0	3	7
Worm-eating Warbler	0	1	1	0	0	0	1	0
Ovenbird	21	18	21	23	22	19	20	21
Northern Waterthrush	18	13	18	20	19	11	16	12
Louisiana Waterthrush	4	3	3	1	2	3	4	5
Kentucky Warbler	3	1	0	1	3	1	0	0
Connecticut Warbler	7	4	5	5	6	5	3	2
Mourning Warbler	9	8	11	14	8	11	8	11
Common Yellowthroat	17	17	21	22	24	20	21	22
Hooded Warbler	1	0	0	0	0	0	0	0
Wilson's Warbler	12	10	14	12	14	10	15	12
Canada Warbler	10	11	13	15	14	13	7	9
Summer Tanager	1	0	0	0	0	0	0	0

(continued)

Table 4. *Continued*

Species	1996	1995	1994	1993	1992	1991	1990	1989
Scarlet Tanager	12	14	19	23	17	17	16	17
Northern Cardinal	22	16	17	22	23	20	20	22
Rose-breasted Grosbeak	22	19	21	23	24	22	22	23
Indigo Bunting	19	17	19	19	20	20	18	19
Dickcissel	3	0	0	0	0	0	0	0
Rufous-sided Towhee	21	12	18	20	19	18	18	17
American Tree Sparrow	6	4	3	1	1	0	1	2
Chipping Sparrow	23	19	22	24	24	22	22	21
Clay-colored Sparrow	12	12	14	15	12	11	10	12
Field Sparrow	17	15	18	17	18	17	18	19
Vesper Sparrow	17	14	14	17	17	15	16	15
Savannah Sparrow	21	16	19	22	21	19	21	19
Grasshopper Sparrow	8	7	10	10	9	8	6	7
Henslow's Sparrow	5	2	3	1	0	1	3	4
Le Conte's Sparrow	3	3	3	4	0	4	4	2
Fox Sparrow	8	1	2	4	3	4	7	7
Song Sparrow	23	19	22	24	24	22	20	23
Lincoln's Sparrow	8	8	8	10	12	5	5	12
Swamp Sparrow	19	18	20	21	21	19	20	23
White-throated Sparrow	23	16	21	22	23	15	21	18
White-crowned Sparrow	20	14	14	16	21	13	19	15
Harris' Sparrow	3	3	0	0	2	2	5	0
Dark-eyed Junco	12	4	6	9	5	3	6	7
Lapland Longspur	2	1	2	1	3	2	2	0
Bobolink	21	18	19	21	22	20	19	19
Red-winged Blackbird	23	19	22	24	24	22	22	23
Eastern Meadowlark	20	18	21	22	22	22	19	18
Western Meadowlark	9	8	10	11	15	11	16	12
Yellow-headed Blackbird	12	13	14	15	19	15	16	17
Rusty Blackbird	2	1	1	0	0	1	0	0
Brewer's Blackbird	14	13	13	13	14	12	14	16
Common Grackle	23	19	22	24	24	22	21	23
Brown-headed Cowbird	23	19	22	24	24	22	21	23
Orchard Oriole	3	1	3	7	3	4	4	3
Northern Oriole	21	17	22	23	24	22	21	22
Purple Finch	17	12	17	17	17	13	13	9
House Finch	23	18	22	22	19	16	12	11
Red Crossbill	2	2	1	1	0	1	2	1
White-winged Crossbill	1	0	0	0	0	0	0	0
Pine Siskin	17	5	11	11	10	6	18	4
American Goldfinch	23	19	22	24	24	22	22	23
Evening Grosbeak	9	5	7	6	7	3	4	4
House Sparrow	21	19	21	24	24	21	22	23
Total Species	254	240	247	244	245	242	244	245
Number of Counts	23	19	22	24	24	22	22	23

White-breasted Nuthatch *by Gerald H. Emmerich, Jr.*

North American Migration Count 1996—Wisconsin

by Jim Frank

The fifth North American Migration Count took place on May 11, 1996 in numerous states and counties across the country. This count differs from Wisconsin's traditional May Counts in that this count attempts to count the *individual numbers* of each species (as you do on Christmas Counts) and the *number of party hours* is reported (again as on Christmas Counts). It differs from Christmas Counts in that the count area is an entire county, *not* a 15 mile diameter circle. In addition, this count is taken on *the same day* across the country *(the second Saturday in May)* to in essence take a "snapshot" of the spring migration in North America. The premise is that *numbers* of birds will create useful comparative data for the future, something the merely "ticking" off species doesn't generate.

The count is held on the second Saturday of May, a time when some of the northern states haven't reached their peak of migration, but still have early lingering migrants. The southern states may be past their peak, but late migrants may still be present in these areas. Because spring migration is so dynamic, counts have to be held on the same day to avoid repetitive counting. Obviously nothing is foolproof, we all are aware of how far birds can fly in a day's time, if they are "on the move."

Please note WSO is still conducting May Counts as they always have, any day in May your county wants to conduct one. It is possible for interested groups to do one count that can be turned in for both the North American Migration Count and the Wisconsin May Count by conducting the May Count on the second Saturday in May and by counting individual birds and party hours in the process.

In examining the counts from the last 4 years, note should be made of improved coverage of northern counties in the state in 1994, 1995, and even more so in 1996 with appropriate species increases. In evaluating 1993's count, its early date of May 8 versus May 14, 1994, May 13, 1995, and May 11, 1996 should be taken into consideration. That 5 day

interval allows a significant wave or two of neotropical migrants to enter the state in many instances. Party hours for 1994 and 1995 were roughly 10% higher than in 1993 allowing fairly reasonable comparison of many species not restricted the northern counties. The 33% increase in number of counties submitting data in 1996 and the consequent increase in party-hours necessitate careful comparison of this year's data with past years.

It should be recorded that count day was a cold one across the state. The highest temperatures on any count barely reached the mid-50's. Early morning lows ranged from the upper 20's in the north to upper 30's in the south. When noting species numbers, it should become fairly apparent that spring migration was lagging behind during the second week of May in Wisconsin. Species generally considered late April migrants such as White-throated Sparrow, Yellow-rumped Warbler, Palm Warbler, Northern Waterthrush, and Ruby-crowned Kinglet were recorded in numbers 3 to 4 times greater than on previous counts, Ruby-crowns actually 10× higher!! Many of the other warblers, tanagers, orioles, and flycatchers were recorded at only 10 to 50% of previous Migration Counts. As might be expected, waterfowl, raptor, and gull numbers were higher as they were "stacked up" waiting for winter to break farther north (some northern Wisconsin lakes were still frozen in the week before the count!). Along with these lingering birds were surprising numbers of "winter finches," Tree Sparrows, Juncos, Rough-legged Hawks, and Glaucous Gulls. Shorebird numbers for some reason weren't as affected, except for both yellowlegs (tending to be late April migrants) which were present in numbers 5 to 10 times normal—all across the state. Readers might want to look at the 5 counts occurring on Lake Michigan from Kewaunee County to Kenosha County, particularly the warblers, to see how few had reached Kewaunee, how earlier warblers were in Sheboygan, Ozaukee, and Milwaukee Counties, with the later warblers just beginning to appear in Kenosha County.

In spite of the late migration, count species totals were very similar to previous years, but the total of all counts was 244 species (a marked increase over species totals in the 220's on previous Migration Days). Of note were White Pelicans in Dodge and Winnebago Counties, 14 ibis winging north over Milwaukee, Willets at Sheboygan and Milwaukee, Red-necked Phalaropes in Winnebago County, a Franklin's Gull in Milwaukee, a Great Gray Owl in Bayfield County, Boreal Chickadees in Vilas County, and a Nelson's Sharp-tailed Sparrow in Sheboygan County.

In addition, one count from 1994 (Waukesha), from 1995 (Dodge) and from 1996 (Dodge) were separated from the main body of data for computation of individuals/hour as party hours were not submitted for these counts.

Hopefully numbers of each species will be fascinating, making one want to speculate as to the actual numbers we could document across the state (and country) with dramatically improved coverage. At a national level,

somebody must have been looking at "our" May migrants in unexpected numbers on their Migration Counts. Though some birders feel the early date isn't conducive to good lists in the northern counties, a look at the following data will suggest otherwise. In migration, there is always something interesting to find. As is becoming traditional, Winnebago County led the way with 180 species, slightly off their 1994 total of 190 species, and their 1993 total of 191 species that placed them second across the country!

The 1997 North American Migration Count is to be held May 10, 1996. Compilers of the 1996 North American Migration Counts are listed below. If you are interested in joining one of the counts, contact the compiler. If you want to initiate a count in a previously uncovered county, please contact Jim Frank, 4339 W. Laverna Ave., Mequon, Wisconsin 53092. Even if you count alone, the data is valuable since it is analyzed per party hour.

Douglas Co. Burnett Hojnacki, 140 Greenwood La., Duluth, Minn. 55803–2049.

Bayfield Co. Phyllis Johnson, P.O. Box 303, Cornucopia, WI 54827.

Vilas Co. Bill Reardon, 2547 Hwy 70E, Eagle River, WI 54521.

Oneida Co. Rosemary Boxrucker, 4413 Highlander Rd., Rhinelander, WI 54501

Florence Co. Jean Strelka, 19315 Killarney Way, Brrokfield, WI 53045.

Marathon Co. Ken & Jan Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479.

Clark Co. Ken & Jan Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479.

Taylor Co. Greg Scott, N3566 Grauer Dr., Withee, WI 54498.

Trempealeau Co. Kathleen Bibby, N18609 La. Ettrick, WI 54627–9003.

Winnebago Co. Tom Ziebell, 1322 Ceape Rd., Oshkosh, WI 54901.

Fond du Lac Co. Jeff Baughman, W8985 Co. Hwy SS, Adell, WI 53001.

Columbia Co. Marvin Calewart, 16635 W. Crescent Dr., New Berlin, WI 53151.

Kewaunee Co. William Mueller, 1242 S. 45th St., Milwaukee, WI 53214.

Sheboygan Co. Scott Baughmann, 133 Park Ave., Sheboygan, WI 53801.

Ozaukee Co. Jim Frank, 4339 W. Laverna Ave., Mequon, WI 53092.

Milwaukee Co. Jim Frank, 4339 W. Laverna Ave., Mequon, WI 53092.

Kenosha Co. Ron Hoffman, Box 886, Kenosha, WI 53141.

Dodge Co. ?

Jim Frank
4339 W. Laverna Ave.
Mequon, Wisconsin 53092

Table 1. Numbers of individuals of each species observed on Migration Day Counts in northern Wisconsin.

Species	Douglas	Bayfield	Vilas	Oneida	Florence	Marathon	Clark	Taylor	Trempeleau
Common Loon	3	1	20	4	1	2		7	
Pied-billed Grebe		2	4		1	53	10	2	
Horned Grebe	4					1			
Red-necked Grebe									
American White Pelican									
Double-crested Cormorant	29	68				286	3	20	
American Bittern		2	3			8	4	6	
Least Bittern									
Great Blue Heron	2	12	3	1	2	181	17	9	
Great Egret									
Snowy Egret									
Cattle Egret									
Green Heron		2				11			
Black-crowned Night-Heron									
Plegadis Ibis (sp.)									
Tundra Swan		9					12	1	
Trumpeter Swan			2			2			
Mute Swan	7	2							
swan (sp.)									
Snow Goose									
Canada Goose	10	21	34		10	119	36	24	
Wood Duck	3	11	16	2	1	35	20	2	
Green-winged Teal	3	3	5			94	5	1	
American Black Duck		3	2		2	2			
Mallard	14	27	313	13	9	353	106	32	
Northern Pintail						3			
Blue-winged Teal	7	19	7			248	54	9	
Northern Shoveler						26	3		
Gadwall		2				4			
American Wigeon		8				12			
Canvasback						8			
Redhead		4				2			
Ring-necked Duck	2	28	174		1	237		35	
Greater Scaup		4							

Lesser Scaup		57	16		48	5	2	
scaup (sp.)	17							
Black Scoter								
Common Goldeneye		17	22		48			
Bufflehead	44	73	28	11	49	3	9	
Hooded Merganser	15	3	30		4	5		
Common Merganser		35	86	4		10		
Red-breasted Merganser		20	7	2		4		
merganser (sp.)								
Ruddy Duck								
Turkey Vulture	16	4		2	11	12		9
Osprey		1	4	1	19			
Bald Eagle	3	5	19		13	4	3	
Northern Harrier		2	2		57	34	8	
Sharp-shinned Hawk	1	2	1	4	8	2		
Cooper's Hawk		1			6	2		
Northern Goshawk		1	2					
accipiter (sp.)								
Red-shouldered Hawk								
Broad-winged Hawk		1	5	2	5	6	4	
Red-tailed Hawk	3	1	2		55	24	1	2
Rough-legged Hawk					1	2	1	
American Kestrel		8	2		57	34	3	2
Merlin					2			
Peregrine Falcon								
hawk (sp.)								
Gray Partridge								
Ring-necked Pheasant					3		4	
Spruce Grouse			2					
Ruffed Grouse	2	9	12	1	28	8	5	
Greater Prairie-Chicken					7	1		
Sharp-tailed Grouse	11						4	
Wild Turkey					10	21		1
Northern Bobwhite								
Yellow Rail								
King Rail								
Virginia Rail		1						

(continued)

Table 1. *Continued*

Species	Douglas	Bayfield	Vilas	Oneida	Florence	Marathon	Clark	Taylor	Trempeleau
Sora					2	20	4	1	
Common Moorhen									
American Coot		7	2			100	4	28	
Sandhill Crane		3	4			128	31	8	
Black-bellied Plover									
American Golden Plover									
Semipalmated Plover									
Killdeer	1	13	8	1	1	90	86	6	
Greater Yellowlegs		34	37			6	38	9	
Lesser Yellowlegs	5	2	13			33	12		
Solitary Sandpiper	1	8	8			4	8		
Willet									
Spotted Sandpiper	2	10	6		1	8	6	2	
Upland Sandpiper		4							
Hudsonian Godwit									
Marbled Godwit									
Ruddy Turnstone									
Sanderling									
Semipalmated Sandpiper									
Least Sandpiper						5			
White-rumped Sandpiper						1			
Pectoral Sandpiper		4							
Dunlin									
peep (sp.)									
Short-billed Dowitcher						1			
dowitcher (sp.)									
Common Snipe		14	10			41	6	7	
American Woodcock			2	1		8	4	1	
Red-necked Phalarope									
Wilson's Phalarope									
Franklin's Gull									
Little Gull									
Bonaparte's Gull		3					10		

Ring-billed Gull		87	2			3			
Herring Gull		104	2			12	4		
Glaucous Gull									
gull (sp.)									
Caspian Tern		1							
Common Tern		2							
Forster's Tern		3							
tern—Sterna (sp.)									
Black Tern						1	1		
Rock Dove		12	23		13	410	289	9	
Mourning Dove	3	21	34	5	3	315	177	6	3
Black-billed Cuckoo									
Yellow-billed Cuckoo									
cuckoo (sp.)									
Eastern Screech-Owl		1				1			
Great Horned Owl	2					18	7	1	
Barred Owl			1			5		5	2
Great Gray Owl		1							
Short-eared Owl									
Northern Saw-whet Owl								1	
Common Nighthawk									
Whip-poor-will						2			
Chimney Swift						18			
Ruby-throated Hummingbird	1					2			1
Belted Kingfisher	2	13	10		2	25	3	2	
Red-headed Woodpecker						1	2		
Red-bellied Woodpecker						14	13		3
Yellow-bellied Sapsucker	1	3	27		4	8	2	7	
Downy Woodpecker		6	19	2	2	73	13	1	1
Hairy Woodpecker	1	8	25	2		37	5	1	
Northern Flicker	3	39	36	4	5	61	29	7	1
Pileated Woodpecker			7			5	2	1	2
Olive-sided Flycatcher									
Eastern Wood Pewee							5		
Yellow-bellied Flycatcher						1			
Acadian Flycatcher									
Alder Flycatcher									

(continued)

Table 1. *Continued*

Species	Douglas	Bayfield	Vilas	Oneida	Florence	Marathon	Clark	Taylor	Trempeleau
Willow Flycatcher									
Least Flycatcher						3			
empidonax (sp.)						4			
Eastern Phoebe	6	9	10		2	52	22	5	1
Great Crested Flycatcher		1							
Eastern Kingbird			1	1		11	7		1
Horned Lark						31	23	4	
Purple Martin	1			2	2	6			
Tree Swallow	75	58	206	7	5	995	303	146	
Northern Rough-winged Swallow						6	3		3
Bank Swallow						21	4		
Cliff Swallow		6	22			141	2	12	
Barn Swallow	2	8	2		3	195	171	9	10
Gray Jay			9						
Blue Jay	5	29	24	11	7	225	116	16	6
American Crow	9	71	86	16	5	551	265	24	18
Common Raven	2	46	30		1	3	5	4	
Black-capped Chickadee	7	80	128	9	26	294	74	22	
Boreal Chickadee			3						
Tufted Titmouse									
Red-breasted Nuthatch		13	27	3	1	25	15	4	
White-breasted Nuthatch	2	17	8	4	3	38	16	2	1
Brown Creeper		8	8	1	1	9	1	1	
House Wren						19			
Winter Wren		8	2		2	4	2		
Sedge Wren						18	7		
Marsh Wren		1				6	3		
Golden-crowned Kinglet		7	10			2			
Ruby-crowned Kinglet	1	25	13		3	29	10	7	
Blue-Gray Gnatcatcher									
Eastern Bluebird	1	3	10		1	48	31	1	
Veery	1		2			12	1		
Gray-cheeked Thrush									
Swainson's Thrush			1			1			

Hermit Thrush	2	3	15		4	16			
Wood Thrush						3	4		3
American Robin	21	99	98	31	21	954	555	46	21
Gray Catbird						6	1	1	
Northern Mockingbird									
Brown Thrasher	2	1	4	1		39	28	1	
American Pipit									
Cedar Waxwing		15				1			
Northern Shrike									
European Starling		46	21	5	55	633	471	23	
Solitary Vireo						1			
Yellow-throated Vireo									
Warbling Vireo						1			
Philadelphia Vireo									
Red-eyed Vireo									
Blue-winged Warbler									
Golden-winged Warbler									
Tennessee Warbler									
Orange-crowned Warbler							1		
Nashville Warbler						1	1		
Northern Parula						1			
Yellow Warbler						26	16		
Chestnut-sided Warbler							1		
Magnolia Warbler									
Cape May Warbler		1						1	
Black-throated Blue Warbler									
Yellow-rumped Warbler	61	52	41		7	1241	208	29	8
Black-throated Green Warbler		16				3			
Blackburnian Warbler					1				
Pine Warbler		1	1				8		
Palm Warbler	2	44	12			95	12	10	
Bay-breasted Warbler									
Blackpoll Warbler									
Cerulean Warbler									
Black-and-white Warbler						23	4	1	
American Redstart		1				1			
Prothonotary Warbler									

(continued)

Table 1. *Continued*

Species	Douglas	Bayfield	Vilas	Oneida	Florence	Marathon	Clark	Taylor	Trempeleau
Worm-eating Warbler									
Ovenbird			1			38	9	1	
Northern Waterthrush		2				13	2	11	
Louisiana Waterthrush									
Kentucky Warbler									
Connecticut Warbler									
Mourning Warbler									
Common Yellowthroat						4	1		
Hooded Warbler									
Wilson's Warbler									
Canada Warbler									
Summer Tanager									
Scarlet Tanager									
Northern Cardinal		1				83	11		8
Rose-breasted Grosbeak	1	9				34	14	3	1
Indigo Bunting							2		
Dickcissel									
Eastern Towhee	4					12	9	1	
American Tree Sparrow		21	6			1	6	1	
Clay-colored Sparrow		6				14	4	1	
Chipping Sparrow	60	73	25		14	300	154	10	7
Field Sparrow				2		21	16		
Vesper Sparrow	4		3			2	2		
Savannah Sparrow		24	11	2	1	160	111	6	1
Grasshopper Sparrow						1	2		
Henslow's Sparrow						2			
Le Conte's Sparrow						9			
Northern Sharp-tailed Sparrow									
Fox Sparrow		1				1	3		
Song Sparrow	5	81	50		7	458	225	32	10
Lincoln's Sparrow			2				1		
Swamp Sparrow		40	19			107	3	13	
White-throated Sparrow	1	59	82	10	5	133	49	12	
White-crowned Sparrow		14	4			11	8		

Harris' Sparrow									
Dark-eyed Junco		42	23	2		10	1	1	
Lapland Longspur									
Snow Bunting			4						
Bobolink						35	28	5	
Red-winged Blackbird	52	314	173	32	36	3015	1846	106	20
Eastern Meadowlark		6				86	90	1	
Western Meadowlark						1			
meadowlark (sp.)			1			11			
Yellow-headed Blackbird						25			
Rusty Blackbird									
Brewer's Blackbird	58	13		28	5	100	157	12	
Common Grackle	3	47	104	5	1	803	583	18	20
Brown-headed Cowbird	21	457	39	4	53	713	445	38	13
blackbird (sp.)									
Orchard Oriole									
Baltimore Oriole	1	4				1	1		
Purple Finch	5	52	65	23		65	8	3	
House Finch		8	11		2	97	73		
Red Crossbill									
White-winged Crossbill									
Common Redpoll	2	78	23	3					
Pine Siskin	4	68	63	5	4	65		3	
American Goldfinch	8	30	34	11	2	257	112	20	
Evening Grosbeak	10	78	117	7			1		
House Sparrow		42	6		1	740	379	17	
SPECIES	62	116	98	35	55	151	120	87	29
INDIVIDUALS	655	3139	2769	260	367	16601	8055	977	179
# Counties									
Parties	1	6	8	2	1	15	7	1	1
Observers	2	39	9	5	2	28	9	2	1
Total rs	11.25	43.5	43	7.5	10	148	79	13	10
Hours—Foot	0	7	17	2	8	35	5	0.5	1.5
Hours—Car	9.75	30.5	26	2.5	2	107	71	12.5	1
Miles—Foot	0	5	11	7	6	26	6	0.5	3
Miles—Car	82	167	344	40	41	1408	816	119	30
Individuals/Hour	58	72	64	35	37	112	102	75	18

Table 2. Numbers of individuals of each species observed on Migration Day Counts in southern Wisconsin.

Species	Winnebago	Fond du Lac	Dodge	Columbus	Kewaunee	Sheboygan	Ozaukee	Milwaukee	Kenosha
Common Loon	2	1							15
Pied-billed Grebe	87	21	6	12	1	10	5	16	7
Horned Grebe	2	1	2				6		1
Red-necked Grebe	4			2					
American White Pelican	6		18						
Double-crested Cormorant	457	28	33		40	44		48	61
American Bittern	11	4	4						2
Least Bittern	1	2	1						1
Great Blue Heron	88	22	55	3	1	4		5	10
Great Egret	16	16	57				1		5
Snowy Egret			1					1	
Cattle Egret	1	2							
Green Heron	7	5	2	2		4	1	1	6
Black-crowned Night-Heron	32		4			2		1	
Plegadis Ibis (sp.)								14	
Tundra Swan		1							
Trumpeter Swan									
Mute Swan		1							4
swan (sp.)	2								
Snow Goose									
Canada Goose	102	66	193	27	8	45	83	96	428
Wood Duck	35	27	5	3		20	2		8
Green-winged Teal	16	16					2		
American Black Duck	2		17					1	
Mallard	304	135	99	41	4	25	28	31	333
Northern Pintail	2		2						
Blue-winged Teal	94	51	75	35	2	13	31	4	14
Northern Shoveler	14	20	13	1			4	4	8
Gadwall	12	16	2				4	3	
American Wigeon	6	16							2
Canvasback	6	1	4						2
Redhead	52	17	17						2
Ring-necked Duck	6	8	23	12		2	2		6
Greater Scaup	6	4			3	57	50	3	35
Lesser Scaup	519	66	7			4	16	46	1
scaup (sp.)	400					20			40

Black Scoter							2		
Common Goldeneye	14						1		2
Bufflehead	32				2		5		5
Hooded Merganser	2	1					1		
Common Merganser	9	4							11
Red-breasted Merganser	19	2				207	363	19	53
merganser (sp.)		2							
Ruddy Duck	34	4	1				2	6	
Turkey Vulture	5	31	9	5		5	4		1
Osprey	3	1							1
Bald Eagle	2								
Northern Harrier	19	21	13	2	2	2	5		1
Sharp-shinned Hawk	4	4	1			2	2		1
Cooper's Hawk	9	1	2			1	1	1	
Northern Goshawk						1			
accipiter (sp.)	1								
Red-shouldered Hawk		1							
Broad-winged Hawk	6	3		1		5			3
Red-tailed Hawk	74	44	12	7	4	7	6	3	6
Rough-legged Hawk	1								1
American Kestrel	29	15	2	3	3	5	5	2	5
Merlin	1		1						
Peregrine Falcon			1				1	1	
hawk (sp.)				3		1			
Gray Partridge									3
Ring-necked Pheasant	28	10	1	3		3	2		5
Spruce Grouse									
Ruffed Grouse		6			1	1	1		
Greater Prairie-Chicken									
Sharp-tailed Grouse									
Wild Turkey	2	12		2	2	5	1		
Northern Bobwhite				1					6
Yellow Rail									
King Rail		1	1			1			
Virginia Rail	8	3	1			2	2	1	3
Sora	69	52	31			8	4	2	2
Common Moorhen	16	1	1				1	1	1

(continued)

Table 2. *Continued*

Species	Winnebago	Fond du Lac	Dodge	Columbus	Kewaunee	Sheboygan	Ozaukee	Milwaukee	Kenosha
American Coot	958	122	34	119		5	5	29	47
Sandhill Crane	210	43	48	16	4		11		3
Black-bellied Plover		4							48
American Golden Plover		47							32
Semipalmated Plover									
Killdeer	97	13	25	6	8	50	17	7	22
Greater Yellowlegs	11	17			4	42	4		1
Lesser Yellowlegs	51	19	2	2	1	37	42		
Solitary Sandpiper	5	6		6		8	8		5
Willet						10		10	
Spotted Sandpiper	17	10				5	4	2	4
Upland Sandpiper	4						1		
Hudsonian Godwit								1	
Marbled Godwit									
Ruddy Turnstone	1	1					3	2	112
Sanderling	1								40
Semipalmated Sandpiper		1							3
Least Sandpiper	4	9	7			2	9		
White-rumped Sandpiper									
Pectoral Sandpiper	19								
Dunlin	2	34	15				2	3	18
peep (sp.)									41
Short-billed Dowitcher	2	1							
dowitcher (sp.)									
Common Snipe	20	5				3			3
American Woodcock	2	7	5			6	14		8
Red-necked Phalarope	2								
Wilson's Phalarope		6					3		
Franklin's Gull								1	
Little Gull									
Bonaparte's Gull	2	1			2000	6000	20	700	2088
Ring-billed Gull	7170	147	3		86	300	220	100	1069
Herring Gull	170	40		26		150	123	100	403
Glaucous Gull						2	2		2

gull (sp.)	200			10					1800
Caspian Tern	4				8	42	3		26
Common Tern	4	1				400	500		500
Forster's Tern	50	25	3			2	15		2
tern—Sterna (sp.)	6								500
Black Tern	44	14	8	72					6
Rock Dove	770	232	57	37	47	50	71	50	171
Mourning Dove	657	153	34	24	7	45	38	22	19
Black-billed Cuckoo									
Yellow-billed Cuckoo									
cuckoo (sp.)									
Eastern Screech-Owl	2	3							
Great Horned Owl	16	6	1			8	1		1
Barred Owl	2	7		2					
Great Gray Owl									
Short-eared Owl									
Northern Saw-whet Owl									
Common Nighthawk		3	1						1
Whip-poor-will									1
Chimney Swift	34	26	11	15		10	5	79	30
Ruby-throated Hummingbird							4	1	
Belted Kingfisher	16	21	5	1	1		3	1	2
Red-headed Woodpecker	2	1						1	2
Red-bellied Woodpecker	15	15	1	3		10	5		3
Yellow-bellied Sapsucker		1	1			3	1		3
Downy Woodpecker	61	38	9	2	2	7	14	10	4
Hairy Woodpecker	11	6	1			2	7	1	2
Northern Flicker	90	44	25	4	5	15	8	15	8
Pileated Woodpecker	1	3							
Olive-sided Flycatcher							1	1	
Eastern Wood Pewee	2	1					1	2	2
Yellow-bellied Flycatcher		1							
Acadian Flycatcher		1							
Alder Flycatcher						2			
Willow Flycatcher			1						
Least Flycatcher	3	9	3			8		3	1
empidonax (sp.)	2		8			5	4	4	14

(continued)

Table 2. *Continued*

Species	Winnebago	Fond du Lac	Dodge	Columbus	Kewaunee	Sheboygan	Ozaukee	Milwaukee	Kenosha
Eastern Phoebe	19	7	4	1	2	4	3	1	1
Great Crested Flycatcher	1	4	1			1	1	3	2
Eastern Kingbird	6	1	1		1		6	4	13
Horned Lark	22	45	3	1	2	3	14		3
Purple Martin	31	18			12		9		26
Tree Swallow	1289	576	123	267	26	400	152	8	200
Northern Rough-winged Swallow	10	59	10			200	42	12	6
Bank Swallow	78	28	1				6		4
Cliff Swallow	40	17	2	18	10		1	2	5
Barn Swallow	328	162	20	234	3	100	234	34	200
Gray Jay									
Blue Jay	158	119	29	40	5	40	49	18	9
American Crow	230	183	30	61	37	75	68	24	40
Common Raven									
Black-capped Chickadee	72	101	19	12	14	47	55	15	12
Boreal Chickadee									
Tufted Titmouse									
Red-breasted Nuthatch	6	16	2	3		6	2	3	3
White-breasted Nuthatch	28	34	72	3		12	8		4
Brown Creeper	4	2				5	1	4	5
House Wren	16	2	10			4	2	2	4
Winter Wren	2			6		4	2	4	
Sedge Wren	4								
Marsh Wren	133		8				3	1	
Golden-crowned Kinglet		10				2	6		
Ruby-crowned Kinglet	60	101	2		1	65	34	65	16
Blue-Gray Gnatcatcher	2	6	2			10	5	1	4
Eastern Bluebird	26	19	1	4		4	3		3
Veery	22	13	3			30	25	20	7
Gray-cheeked Thrush	3	5	1	2		45	6	29	4
Swainson's Thrush	21	15	19	1		35	42	53	8
Hermit Thrush	15	11	5	2		15	5	6	3
Wood Thrush	4	6	7	2		10	7	3	4
American Robin	1387	531	189	100	90	400	135	55	200

Gray Catbird	22	12	10	7		15	5	17	5
Northern Mockingbird									
Brown Thrasher	26	29		7		3	1	6	4
American Pipit									
Cedar Waxwing	11						5	3	
Northern Shrike			1						
European Starling	1406	456	109	60	223	200	104	28	200
Solitary Vireo	3	6	1			1	3		
Yellow-throated Vireo		1				1	1		
Warbling Vireo	1		1					1	
Philadelphia Vireo				1					
Red-eyed Vireo	1								
Blue-winged Warbler	1						1	1	1
Golden-winged Warbler		1							1
Tennessee Warbler	2								
Orange-crowned Warbler						1	2		
Nashville Warbler	2	12	4			8	19	53	
Northern Parula	1	5	1			12		25	1
Yellow Warbler	56	69		21		30	10	3	9
Chestnut-sided Warbler	1	10				4	1	2	3
Magnolia Warbler	2	4		2			2		38
Cape May Warbler	1	5				5			12
Black-throated Blue Warbler		3				1		2	11
Yellow-rumped Warbler	160	874	78	37	3	400	62	88	15
Black-throated Green Warbler	10	11	28	2		25	16	11	4
Blackburnian Warbler	1	2	1			18	1	2	3
Pine Warbler		2					4	2	
Palm Warbler	29	114	20	1	1	200	35	118	5
Bay-breasted Warbler	1								1
Blackpoll Warbler	1	2							2
Cerulean Warbler		1							2
Black-and-white Warbler	40	52	15	4	2	60	30	12	21
American Redstart	1	12	4	3		10	5	6	6
Prothonotary Warbler	1	1							2
Worm-eating Warbler		1							
Ovenbird	35	37	4	3		60	24	23	161
Northern Waterthrush	36	27	3			45	16	7	4

(continued)

Table 2. *Continued*

Species	Winnebago	Fond du Lac	Dodge	Columbus	Kewaunee	Sheboygan	Ozaukee	Milwaukee	Kenosha
Louisiana Waterthrush		1							
Kentucky Warbler		1							
Connecticut Warbler	1		1						3
Mourning Warbler		1							
Common Yellowthroat	7	17	6	2		15	9	8	9
Hooded Warbler									
Wilson's Warbler	1	1				2	1	1	1
Canada Warbler	1	3							2
Summer Tanager									
Scarlet Tanager			1					2	
Northern Cardinal	108	71	20	17	3	30	27	25	21
Rose-breasted Grosbeak	38	27	1	1		20	7	5	7
Indigo Bunting	1	1	1			2	1	4	1
Dickcissel			1						
Eastern Towhee	3	13		8	1	15	11	5	6
American Tree Sparrow			2	1					1
Clay-colored Sparrow		1				3	3	2	
Chipping Sparrow	208	116	28	48	12	45	51	47	13
Field Sparrow	3	10	7	27	2	30	22	3	
Vesper Sparrow	4	5	4			4			1
Savannah Sparrow	204	62	2		2	15	32	5	1
Grasshopper Sparrow							1	1	
Henslow's Sparrow		4							
Le Conte's Sparrow									
Northern Sharp-tailed Sparrow						1			
Fox Sparrow	2	1							
Song Sparrow	710	166	119	45	12	35	63	38	4
Lincoln's Sparrow	2	4				2	1	5	
Swamp Sparrow	180	127	42			15	16	26	5
White-throated Sparrow	221	174	60	16	28	70	20	67	18
White-crowned Sparrow	6	5	20		2	50	4	19	3
Harris' Sparrow									
Dark-eyed Junco	2	2	2	3		15	3	10	5
Lapland Longspur	40								

Snow Bunting									
Bobolink	27	12	2		8	6	38		3
Red-winged Blackbird	5250	2053	560	322	185	300	374	60	1000
Eastern Meadowlark	37	59		20	12	150	17		9
Western Meadowlark	1	1					2		
meadowlark (sp.)	2								
Yellow-headed Blackbird	438	27	59	14				1	7
Rusty Blackbird	7	2							
Brewer's Blackbird	19		1	15					20
Common Grackle	1216	773	111	62	67	200	160	50	1000
Brown-headed Cowbird	444	210	77	34	33	250	39	40	7
blackbird (sp.)				50					1000
Orchard Oriole									
Baltimore Oriole	12	5		1		12	5	9	27
Purple Finch	6	4				4	5		
House Finch	377	93	7	19	23	200	43	21	6
Red Crossbill									
White-winged Crossbill	12								
Common Redpoll									
Pine Siskin	10	14	1			15	2	5	2
American Goldfinch	212	121	34	14	17	70	40	47	18
Evening Grosbeak		2				4			
House Sparrow	1291	199	12	43	42		29	30	40
SPECIES	180	168	125	83	57	128	145	117	155
INDIVIDUALS	30401	10095	3039	2170	3127	12031	4102	2768	12669
# Counties									
Parties	12	5		1	3	3	2	3	1
Observers	26	14	14	2	5	6	9	7	3
Total Hours	138	62		15	9	20	21	20	15
Hours—Foot	41	27		1	1	2	13	12	3
Hours—Car	97	35		12	8	15	8	5	12
Miles—Foot	40	15		1	2	2	5	6	3
Miles—Car	749	505		151	95	235	149		108
Individuals/Hour	220	163		145	347	601	195	138	845

Table 3. Totals for state by year.

Species	1996	1995	1994	1993
Common Loon	56	55	32	9
Pied-billed Grebe	237	69	36	68
Horned Grebe	17			
Red-necked Grebe	6	3	10	22
American White Pelican	24	8		
Double-crested Cormorant	1117	377	219	587
American Bittern	44	29	35	33
Least Bittern	5	15	5	7
Great Blue Heron	415	283	261	195
Great Egret	95	73	8	92
Snowy Egret	2	1		
Cattle Egret	3	3		
Green Heron	41	33	80	61
Black-crowned Night-Heron	39	46	36	11
Plegadis Ibis (sp.)	14			
Tundra Swan	23	3		
Trumpeter Swan	4	1	2	4
Mute Swan	14	17	1	2
swan (sp.)	2		1	2
Snow Goose		1	2	
Canada Goose	1202	1924	906	436
Wood Duck	190	205	184	139
Green-winged Teal	145	36	36	12
American Black Duck	29	12	42	7
Mallard	1777	1526	1981	942
Northern Pintail	7	4	30	12
Blue-winged Teal	663	421	342	396
Northern Shoveler	93	33	31	65
Gadwall	43	40	32	27
American Wigeon	44	34	7	20
Canvasback	21	1	8	2
Redhead	94	78	48	101
Ring-necked Duck	526	93	14	101
Greater Scaup	162	4	5	11
Lesser Scaup	128	223	22	46
scaup (sp.)	477	10	11	67
Black Scoter	2			
Common Goldeneye	104	4	1	19
Bufflehead	261	13	10	39
Hooded Merganser	61	26	14	6
Common Merganser	159	22	23	9
Red-breasted Merganser	696	10	25	202
merganser (sp.)	2	2		
Ruddy Duck	47	42	85	116
Turkey Vulture	114	34	29	33
Osprey	30	10	14	18
Bald Eagle	49	37	26	19
Northern Harrier	168	90	82	113
Sharp-shinned Hawk	32	11	7	8
Cooper's Hawk	24	13	10	14
Northern Goshawk	4	2	2	
accipiter (sp.)	1	1		
Red-shouldered Hawk	1	2		
Broad-winged Hawk	41	27	14	29

(continued)

Table 3. *Continued*

Species	1996	1995	1994	1993
Red-tailed Hawk	251	96	137	142
Rough-legged Hawk	6	1		
American Kestrel	175	104	88	121
Merlin	4		3	
Peregrine Falcon	3		2	
hawk (sp.)	4		2	4
Gray Partridge	3		2	2
Ring-necked Pheasant	59	66	77	120
Spruce Grouse	2		6	
Ruffed Grouse	74	64	36	11
Greater Prairie-Chicken	8	16	18	11
Sharp-tailed Grouse	15	6	4	
Wild Turkey	56	10	19	4
Northern Bobwhite	7		9	3
Yellow Rail			2	7
King Rail	3	3	1	1
Virginia Rail	21	30	19	16
Sora	195	157	76	165
Common Moorhen	21	7	11	9
American Coot	1463	179	259	361
Sandhill Crane	509	432	532	347
Black-bellied Plover	52	4	97	
American Golden Plover	79	20	68	1
Semipalmated Plover		6	13	1
Killdeer	451	494	622	516
Greater Yellowlegs	203	8	22	21
Lesser Yellowlegs	219	22	64	67
Solitary Sandpiper	69	5	13	13
Willet	20			
Spotted Sandpiper	77	90	55	34
Upland Sandpiper	9	3	14	5
Hudsonian Godwit	1		4	
Marbled Godwit			1	
Ruddy Turnstone	119	118	336	26
Sanderling	41	16	14	30
Semipalmated Sandpiper	4	16	27	
Least Sandpiper	36	49	74	18
White-rumped Sandpiper	1	1		
Pectoral Sandpiper	23	8	5	47
Dunlin	74	75	33	2
peep (sp.)	41		71	21
Short-billed Dowitcher	4	10	15	6
dowitcher (sp.)			2	9
Common Snipe	109	77	67	65
American Woodcock	58	40	34	50
Red-necked Phalarope	2			
Wilson's Phalarope	9		17	7
Franklin's Gull	1			
Little Gull		2		
Bonaparte's Gull	10824	280	316	1056
Ring-billed Gull	9187	6261	4310	4363
Herring Gull	1134	385	872	2817
Glaucous Gull	6			
gull (sp.)	2010	2354	8425	2151

(continued)

Table 3. *Continued*

Species	1996	1995	1994	1993
Caspian Tern	84		149	45
Common Tern	1407	398	586	102
Forster's Tern	100	157	119	127
tern—Sterna (sp.)	506	1223	13082	171
Black Tern	146	332	123	88
Rock Dove	2245	1549	1710	1664
Mourning Dove	1566	1340	1050	1226
Black-billed Cuckoo		1	3	1
Yellow-billed Cuckoo			1	
cuckoo (sp.)		1		
Eastern Screech-Owl	7	2	5	
Great Horned Owl	61	26	19	14
Barred Owl	24	20	8	8
Great Gray Owl	1			
Short-eared Owl		1		
Northern Saw-whet Owl	1	1	2	
Common Nighthawk	4	10	14	52
Whip-poor-will	3	24	4	14
Chimney Swift	238	337	565	430
Ruby-throated Hummingbird	9	15	35	15
Belted Kingfisher	107	37	36	45
Red-headed Woodpecker	9	13	37	46
Red-bellied Woodpecker	82	32	46	36
Yellow-bellied Sapsucker	61	69	39	17
Downy Woodpecker	264	159	149	101
Hairy Woodpecker	109	95	71	39
Northern Flicker	399	447	287	233
Pileated Woodpecker	21	25	19	7
Olive-sided Flycatcher	2			
Eastern Wood Pewee	13	6	26	8
Yellow-bellied Flycatcher	2		1	2
Acadian Flycatcher	1		1	
Alder Flycatcher	2		8	1
Willow Flycatcher	1	2	5	2
Least Flycatcher	30	59	181	165
empidonax (sp.)	33	9	8	15
Eastern Phoebe	149	103	126	92
Great Crested Flycatcher	14	56	158	96
Eastern Kingbird	53	96	241	192
Horned Lark	151	102	62	184
Purple Martin	107	179	269	341
Tree Swallow	4836	6822	3921	2129
Northern Rough-winged Swallow	351	579	385	97
Bank Swallow	142	457	566	629
Cliff Swallow	288	1313	1704	1138
Barn Swallow	1715	2264	1768	1146
Gray Jay	9	8	8	
Blue Jay	906	798	751	919
American Crow	1792	1544	1431	907
Common Raven	91	80	36	11
Black-capped Chickadee	987	820	628	568
Boreal Chickadee	3			
Tufted Titmouse			1	
Red-breasted Nuthatch	138	85	60	6

(continued)

Table 3. *Continued*

Species	1996	1995	1994	1993
White-breasted Nuthatch	250	140	116	99
Brown Creeper	50	12	11	8
House Wren	59	277	384	278
Winter Wren	36	22	16	8
Sedge Wren	29	109	403	260
Marsh Wren	155	508	585	342
Golden-crowned Kinglet	37	18	7	12
Ruby-crowned Kinglet	432	45	46	67
Blue-Gray Gnatcatcher	30	61	59	54
Eastern Bluebird	135	94	152	100
Veery	136	40	50	22
Gray-cheeked Thrush	65	9	8	16
Swainson's Thrush	196	44	43	30
Hermit Thrush	102	39	60	16
Wood Thrush	53	89	119	80
American Robin	3933	4210	3577	3050
Gray Catbird	101	275	550	368
Northern Mockingbird			1	
Brown Thrasher	152	115	138	132
American Pipit			3	10
Cedar Waxwing	35	96	148	101
Northern Shrike	1		1	
European Starling	4040	3795	3589	3403
Solitary Vireo	15	13	15	7
Yellow-throated Vireo	3	15	29	27
Warbling Vireo	4	83	134	94
Philadelphia Vireo	1	2	3	2
Red-eyed Vireo	1	17	84	13
Blue-winged Warbler	4	9	25	14
Golden-winged Warbler	2	37	81	46
Tennessee Warbler	2	52	127	42
Orange-crowned Warbler	4	1	7	11
Nashville Warbler	100	174	292	170
Northern Parula	46	10	27	7
Yellow Warbler	250	604	771	457
Chestnut-sided Warbler	22	77	228	116
Magnolia Warbler	48	82	188	91
Cape May Warbler	25	75	89	87
Black-throated Blue Warbler	17	15	7	6
Yellow-rumped Warbler	2364	977	1018	691
Black-throated Green Warbler	126	83	104	53
Blackburnian Warbler	29	46	74	38
Pine Warbler	18	16	34	26
Palm Warbler	698	270	185	155
Bay-breasted Warbler	2	12	89	25
Blackpoll Warbler	5	9	34	21
Cerulean Warbler	3	2	8	2
Black-and-white Warbler	264	117	115	134
American Redstart	49	142	237	122
Prothonotary Warbler	4	3	2	
Worm-eating Warbler	1	1	1	1
Ovenbird	396	738	611	509
Northern Waterthrush	166	37	38	52
Louisiana Waterthrush	1	1		

(continued)

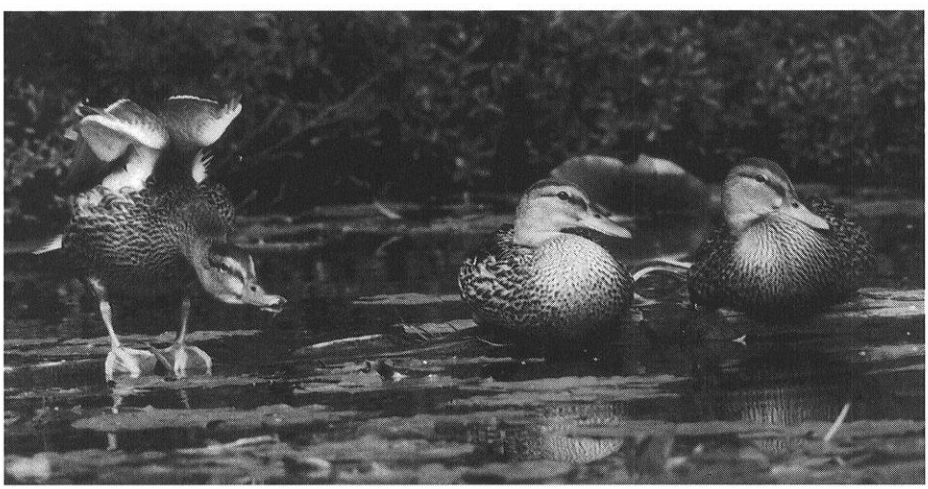
Table 3. *Continued*

Species	1996	1995	1994	1993
Kentucky Warbler	1			
Connecticut Warbler	5	6	4	
Mourning Warbler	1	5	7	1
Common Yellowthroat	78	309	626	472
Hooded Warbler			1	
Wilson's Warbler	7	3	31	9
Canada Warbler	6	18	25	5
Summer Tanager			1	
Scarlet Tanager	3	37	84	48
Northern Cardinal	425	330	355	305
Rose-breasted Grosbeak	168	418	604	295
Indigo Bunting	13	42	132	51
Dickcissel				
Eastern Towhee	88	76	115	83
American Tree Sparrow	39	36	19	3
Clay-colored Sparrow	34	149	61	105
Chipping Sparrow	1211	1288	1306	696
Field Sparrow	143	95	76	80
Vesper Sparrow	29	36	37	28
Savannah Sparrow	639	828	892	1006
Grasshopper Sparrow	5	2	17	5
Henslow's Sparrow	6	8		
Le Conte's Sparrow	9	3	2	2
Northern Sharp-tailed Sparrow	1			
Fox Sparrow	8	4	2	4
Song Sparrow	2060	1782	1579	1579
Lincoln's Sparrow	17	12	15	7
Swamp Sparrow	593	751	264	486
White-throated Sparrow	1025	295	253	264
White-crowned Sparrow	144	96	51	38
Harris' Sparrow		1		
Dark-eyed Junco	121	27	29	3
Lapland Longspur	40	205	300	30
Snow Bunting	4			
Bobolink	164	261	301	361
Red-winged Blackbird	15698	13282	10878	8762
Eastern Meadowlark	487	323	287	389
Western Meadowlark	5	15	12	29
meadowlark (sp.)	14		3	19
Yellow-headed Blackbird	571	420	601	742
Rusty Blackbird	9	2		
Brewer's Blackbird	433	253	395	201
Common Grackle	5223	3633	3150	3461
Brown-headed Cowbird	2917	1245	1138	1009
blackbird (sp.)	1050	116	100	100
Orchard Oriole		3	1	15
Baltimore Oriole	78	227	474	350
Purple Finch	240	155	132	30
House Finch	980	523	499	340
Red Crossbill		4	1	
White-winged Crossbill	12			
Common Redpoll	106			
Pine Siskin	261	296	62	5
American Goldfinch	1047	1784	1777	1295

(continued)

Table 3. *Continued*

Species	1996	1995	1994	1993
Evening Grosbeak	219	121	120	
House Sparrow	2811	3014	3276	3978
SPECIES	244	226	229	222
INDIVIDUALS	113404	83165	87395	66071
	−3039	−4133	−15376	
# Counties	18	14	12	9
Parties	72	66	68	50
Observers	184	141	127	90
Total Hours	720	541	530	490
Hours—Foot	176	124.75		
Hours—Car	454	401.25		
Miles—Foot	138	92.5		
Miles—Car	5039	4634		
Individuals/Hour	153	128	136	135



Female Mallards *by Gerald H. Emmerich, Jr.*

WSO Records Committee Report—Spring 1996

Seventy-two documentations were reviewed by the WSO Records Committee for the Spring of 1996, with an additional look at three records from the previous year. These accounts covered the identification of twenty-eight species. Fifty two records were accepted. Observers were notified of the committee decisions by postcard in the case of accepted records and by personal letter in the case of records not accepted.

by Jim Frank

ACCEPTED

Plegadis Ibis—

(#96-030) *Milwaukee Co.,* 11 May 1996, Gustafson.

(#96-031) *Door Co.,* 19 May 1996, Regan.

Fourteen birds were seen in flight in Milwaukee with very dark blackish bodies. The initial impression of cormorants was quickly altered when noting the long decurved bills. The wingbeat was faster than a heron's, and the flapping periods alternated with short gliding periods. No facial skin coloration was detectable. In Door County, the single bird was seen standing in a field in a flock of Herring Gulls. Again the all dark, but slightly reddish coloration and long decurved bill were evident. In flight, the neck and legs were outstretched, the neck positioned below the level of the body.

Ross' Goose—

(#96-032) *Dodge Co.,* 24 March 1996, T.Wood; 13 April 1996, Domagalski; 14 April 1996, Korducki. (2 birds).

(#96-033) *Columbia Co.,* 31 March 1996, Schultz; 31 March 1996, Peterson; 2 April 1996, Robbins; 8 April 1996, Gustafson. (1 bird).

Described was a white goose, as small as adjacent Mallards and Pintails, with black wing tips. The top of the head was more rounded than that of the larger Canada Geese. The bill was stubby and pink, lacking the so called dark "grin patch" of a Snow Goose.

Eurasian Wigeon—

(#96-071) *Outagamie Co.,* 15 April 1996,

Nussbaum; 15,17 April 1996, Peterson; 15, 21 April 1996, Tessen; 20 April 1996, Frank; ? April 1996, Mead.

Generally seen in association with American Wigeons, this bird stood out even when sleeping because of its cinnamon-orange head. In addition, the forehead was light yellowish rather than white, the flanks were gray instead of pink-brown. As also noted in the American Wigeon, the back was gray, the breast salmon-pink, the caudal flank had a white crescent in front of the black tail, and the bill was light blue-gray.

Gyrfalcon—

(#96-035) *Brown Co.,* 23 March 1996, Baumann; 25 March 1996, LaPlant; 26 April 1996, Reed.

A large rather uniformly medium gray hawk was observed with broad, but pointed wings, and a broad unmarked tail described as an extension of the body rather than a tail. The uniform coloration was broken by diffuse darker mottling. In one observation direct interaction with a Peregrine Falcon was reported to demonstrate this falcon to be noticeably larger than the Peregrine. In one instance a darker malar streak was seen. (The April 26th bird was seemingly darker in color than that reported in the first two instances—suggesting perhaps a second bird?)

Ruff—

(#96-039) *Outagamie Co.,* 16 May 1996, Tessen.

Noted in flight with a Lesser Yellowlegs, this shorebird was slightly larger, brown-black in general coloration, with a U-shaped white band on the rump.

(#95–053) *Racine Co.,* 6 May 1995, DeBoer.

This "previous year's" record was of a dark shorebird in a flooded field. The head was cinnamon, the face and neck glossy purple, the body jet black, and the legs yellow. It was seen to display its "ruff" to a Lesser Yellowlegs. In flight, the rump appeared to have two white ovals on the sides.

Black-necked Stilt—

(#96-036) *Fond du Lac Co.,* 19 May 1996, Schultz, Tessen.

(#96-037) *Waukesha Co.,* 31 May 1996, Strelka.

Nearly as tall as a Hudsonian Godwit, this shorebird had black upperparts, white underparts, a long slender black bill, and long pink legs.

Laughing Gull—

(#96-041) *Manitowoc Co.,* 21, 23 May 1996, Tessen.

(#96-042) *Milwaukee Co.,* 21 May 1996, Korducki.

(#96-081) *Dane Co.,* 22 May 1996, Hilsenhoff.

(#96-043) *Ozaukee Co.,* 27 May 1996, Domagalski.

These adult, alternate plumaged birds were slightly smaller than adjacent Ring-billed Gulls, exhibiting slightly darker gray mantles. The black hood, white eyering, and black primary tips void of white marking were also noted. To distinguish the Laughing Gull from a Franklin's Gull (which was present at the same time in Manitowoc and Milwaukee) the longer, red-black bill was noted to be drooped toward the tip. Be reminded that the absence of white primary spots does not exclude a Franklin's Gull from the iden-

tification. In transition to a second alternate plumage, a Franklin's may not have these anticipated spots in the primary tips. The bill size and shape is extremely important in the identification of Laughing Gulls.

Iceland Gull—

(#96-047) *Manitowoc Co.,* 6 May 1996, Sontag.

This adult bird had a gray mantle, but an otherwise all white body. The yellow bill was smaller than that of adjacent Herring Gulls as was the bird's overall size. The primaries lacked any evidence of dark markings and the wing tips extended beyond the tail.

(#96-083) *Manitowoc Co.,* 19 May 1996, Schultz.

This first year bird was similar in size to adjacent Herring Gulls, but noticeably pale overall, particularly striking in the whitish wings (above and below). The plumage, particularly the upperparts, had a brownish-gray mottling. To distinguish the species from a Glaucous Gull, the small, entirely black bill was noted (a Glaucous Gull would have a light bill with a dark distal half).

Lesser Black-backed Gull—

(#96-048) *Milwaukee Co.,* 16 March 1996, Korducki.

This 3rd year bird was easily picked out from the Ring-billed and Herring Gulls by the charcoal gray mantle. It was overall intermediate in size between the two other species. The legs were yellow, the scapulars still had some brown feathering, the head had a bit of brown streaking, and the bill was yellow with a black ring toward the tip.

(#96-049) *Douglas Co.,* 20 April 1996, Johnson.

This adult bird easily stood out from the adjacent Ring-billed and Herring Gulls on the basis of the nearly black mantle. The overall size was again intermediate between the other two species, the yellow bill more slender than the Herring Gulls' bills, and the legs were orangish. The underside of the flight feathers had a dark bar running the entire length of the wing.

(#96-050) *Manitowoc Co.,* 3 April 1996, Wood.

This adult bird was identified based on the dark gray mantle in contrast to the black primaries. The bird was slightly smaller than adjacent Herring Gulls, with a slightly thinner, yellow bill, and light yellow legs.

(#96-084) *Manitowoc Co.,* 6,24 May 1996. Sontag.

This first summer bird was intermediate in size between adjacent Herring and Ring-billed Gulls with very dark brown wings and mantle, and a very dark terminal tail band. The rump was very light in contrast to the mantle and tail band. The head, belly, and breast were mottled, lighter in color than the mantle and wings. The leg color was not clearly discernible.

Black-legged Kittiwake—

(#96-051) *Manitowoc Co.,* 3 April 1996, Tessen; 14 April 1996, Mead.

A small white gull, smaller than adjacent Ring-billed Gulls, was noted to have a gray mantle, a black "W" across the back and upper wings, a black nape streak, and a black, terminal tail band. The bill and legs were black.

Great Gray Owl—

(#96-013) *Green Lake Co.,* 31 March 1996, Wood.

A large gray owl, lacking ear tufts,

but having yellow eyes, large facial disks, and white moustache marks was reported. This is assumed to be the same individual reported since early February in this area.

Boreal Owl—

(#96-057) *Shawano Co.,* 8 March 1996, Peterson (photo), Tessen.

A small brown owl was seen at close range. The gray facial disks had a black border. The brown forehead and back had white spots. The breast had brown and white vertical streaking. Also reported were yellow eyes and a gray bill.

Scissor-tailed Flycatcher—

(#96-059) *Shawano Co.,* 13 May 1996, Shepard; 15 May 1996, Oberhauser.

Described as having "a catbird-sized body," this light gray bird had black wings and a long "double tail." Comprising 50% of the bird's total length, the tail was also black, but the outer edge was white. Salmon or crimson patches were noted on the side of the body near the axillae. It was hovering over alfalfa plants, landing on the top of dead weed stems, or dropping to the ground, apparently catching insects.

Mountain Bluebird—

(#96-060) *Outagamie Co.,* 4 April 1996, Brandel.

A bluebird-sized individual, the dark blue back and head faded to lighter blue on the breast, and ultimately to white on the belly. No orange coloration was seen. The bill and legs were black.

Yellow-throated Warbler—

(#96-061) *Sheboygan Co.,* 18 May 1996, Henrickson.

(#96-062) *Grant Co.,* 28,31 May 1996, Wood; 29 May 1996, Tessen.

A warbler was described as having a gray back and wings, and a white breast and wingbars. The crown, forehead, and side of face were black. This black then trailed down the neck into flank streaking. White was also noted in the eye crescents, the ear covert, and the supercilium. Completing the description was the bright yellow throat.

Western Tanager—

(#96-064) *Waukesha Co.,* 11 May 1996, Aune.

(#96-065) *Winnebago Co.,* 12 May 1996, Rolf.

(#96-066) *Washington Co.,* 13–17 May 1996, Putz.

(#95–054) *Racine Co.,* 14 May 1995, DeBoer.

A cowbird-sized, yellow bird was reported to have a black back, wings, and tail. A large, upper wing bar and smaller lower wing bar were also mentioned. Of course the most striking feature was the red head. These reports bring the recent spring records for Wisconsin bird feeders to 2 in 1994, 4 in 1995, and 3 in 1996.

Spotted Towhee—

(#96-069) *Milwaukee Co.,* 31 March–9 May 1996, Huxley; 7 April 1996, Bontly.

This female towhee had rufous sides, a white belly and charcoal gray back, wings, and tail. There were prominent white wingbars and white spots on the scapulars. The beak was black and the eye red.

Eurasian Tree Sparrow—

(#96-070) *Door Co.,* 30 March 1996, Yeomans.

Though resembling a House Spar-

row, this individual lacked any gray on the head. The brown head had a black ear patch on a white cheek along with a black throat. The breast was buffy, the back striped, and faint wingbars were discernible. This the fourth Wisconsin record, but the second in the past three years.

Not Accepted

Wilson's Storm-Petrel—
(#96-029) *Milwaukee Co.,* 29 April 1996.

Four "all black" birds with "a light grey or white rump patch" were reported from the Lake Michigan shoreline flying into a strong north wind on an overcast day. The body was described as chunkier than a swallow, but there was no other size reference reported. Of interest is the indication they flew a foot above the waves, with rapid wingbeats, at times hovering with feet dangling down. There was no suggestion of a white belly or of a different bill shape in the report. Without these additional features, consideration must also be given to the portion of the documentation that states "they flew like swallows." On windy days such as this, swallows have been seen to hug the waves as they fly along the Lake Michigan shore at this time of year, and to seemingly have their legs dangle as they stop to hover over a prospective bit of food. The chunkier body and light rump might fit in a Cliff Swallow description, little color being discernible on such a gray day.

Barrow's Goldeneye—
(#96-034) *Winnebago Co.,* 7 April 1996.

A female goldeneye was reported to be of the same size and shape as the other goldeneyes present. The indication that the head was more "slanted back" and more slanted on the back of the head seems different than a more anticipated steeper forehead of a Barrow's Goldeneye. In addition, the bill was described as totally yellow, but larger than the other goldeneyes' bills instead of smaller. Immature female Common Goldeneyes will exhibit little white in the wings as this bird apparently did and in addition, have in rare instances, an all yellow bill. Given the difficulty distinguishing the females of the species, and the slanted back head instead of steeper forehead, basing the identification on the all yellow bill may not be safe, given that it is a rare trait in some Common Goldeneyes.

Red-necked Stint (formerly Rufous-necked Stint)—
(#96-038) *Marinette Co.,* 24 May 1996, (5 reports and photos).

This small shorebird was seen feeding in the vicinity of Dunlin and Semipalmated Sandpipers. It fed more like them than the classic wave-chasing feeding behavior of Sanderlings. The eyecatching features of the bird were the rufous hue to the brownish color of the face and throat. In addition, the brown markings stopped rather abruptly at the base of the neck and just began to trail down the edge of the upper breast under the folded wing. One observer described the bird in flight as lacking the white wing line, as well as the white rump with a median brown stripe of a sanderling. The characteristics it did have were not reported though. Of interest and confusion is the different assessments of the size of this individual. Reports varied from slightly smaller than the Dunlins, to noticeably smaller than the Dunlins—about the size of a Semipal-

mated Sandpiper, to the size of a Sanderling.

Fortunately there were several excellent photos to evaluate. In several photo angles, the bird appeared to be imperceptibly smaller than the Dunlin immediately next to it. A probable Semipalmated Sandpiper in another photo seemed noticeably smaller than both the Dunlin and the bird in question. The black bill was a bit longer in proportion to the head than the bill of various "peeps," more in range of a Sanderling bill size. The photos did capture the rufous hue to the neck and face area as well as the sudden end of this color at the lower end of the neck. This rufous neck area should be a "clean," unmarked rufous in color in a Red-necked Stint. The photos demonstrate an overlay of dark flecking extending across both the face and the neck. This would also be consistent with a Sanderling. A Red-necked Stint would also have very rufous scapular feather edges that contrast with the gray wing coverts. The rufous color in this bird was present in the scapulars but continued through the wing coverts, again as a Sanderling would exhibit. The colored feathering that barely starts down the edge of the upper breast under the wing should be dark in color in Red-necked Stint, with little rufous color. In this bird these feathers were rufous and dark-flecked, similar to the face and neck pattern; once again consistent with a Sanderling. The limited extent of this coloration on the flanks may reflect an individual variation or a not quite complete moult. Also not present in the photographs of the bird is the anticipated whitish area around the base of the bill on a Red-necked Stint. Though the photos are not necessarily close enough to be absolutely definitive, a characteristic of the feet is also of interest. One of the photos captures enough of the feet of a Dunlin and the bird in question to make mention of one other characteristic not commonly presented in field guides since it may not be an easily seen "field" mark. The Dunlin's foot exhibits a hind toe. It does not show on the other bird's feet on either the standing or elevated foot, though admittedly it could be missed at the given angle. Some ornithologists advocate separating the Sanderling into a genus of its own based on this unique characteristic of lacking a rear toe.

Though the feeding behavior was reportedly not the classic Sanderling "back and forth" wave chasing behavior, one observer did describe the bird to "run along the length of the beach" "not back and forth with the waves." The apparent lack of a white wing stripe and the anticipated white rump with a medial dark line are inexplicable; however, there unfortunately was no notation of what replaced these patterns to aid us in analysis. The variation in size description between the different documentations points to one of the difficulties in describing a bird. Even at reasonably close range, our eye can be fooled a bit. Some of the documentations were well written and the bird well described, even noting the extent of the rufous down from the scapulars into the wing coverts, an aid in suggesting this was not a stint. Fortunately photos were taken to give us more certainty that this was in all likelihood a Sanderling in a bit unusual, but recognized rufous hue. Several sources including *Shorebirds an Identification Guide* by Hayman, Marchant, and Prater specifically state that a Sander-

ling and Red-necked Stint may look strikingly similar except for the size difference.

Laughing Gull—

(#96-040) *Brown Co.,* 24 April 1996.

A black-headed gull was described to be slightly smaller than adjacent Ring-billed Gulls, with a bill similar in size. In flight no white spots were detected. Franklin's Gulls approaching adult plumage do not necessarily exhibit white spots in the primary tips. To definitively identify a Laughing Gull, the proportionately longer, droop-tipped bill would need to be seen. The identification of this individual is thus not certain.

(#96-082) *Milwaukee Co.,* 28 May 1996.

An immature gull with overall coloration suggestive of a Laughing Gull was reported, but inconsistent features included size larger than Ring-billed Gulls, pinkish legs, and a yellowish bill with a bit of black towards the end. The bill was felt to be slightly drooped at the tip. Again the identification is uncertain.

Common Black-headed Gull—

(#96-044) *Bayfield Co.,* 19 May 1996.

(#96-045) *Ashland Co.,* 21 May 1996.

These two birds were described as slightly smaller than Ring-billed Gulls standing adjacent to or in pursuit of them. A dark ear spot was noted as well as a proportionately longer yellow bill that had a black tip. The legs were grayish-yellow and the tail had a terminal black band. Unfortunately, a description of the mantle was not given, nor was the striking underwing pattern noted. The bill color and length are intriguing, however.

Thayer's Gull—

(#96-046) *Manitowoc Co.,* 31 March 1996.

A first year gull was described as dark gray-brown overall, with darker wings and tail. The bird was described as almost like the first year Herring Gull in intensity of brown color, but the bird seemed smaller and more rounded in head shape than a Herring Gull. The bill was felt to be dark to the base, whereas a Herring Gull would normally show some pale color to the base of the lower mandible. The tail band was described contrasting with the lighter rump, but the lack of darker color through the secondaries of a Thayer's Gull was not noted. A first year Herring Gull would have darker color across both primaries and secondaries. This is probably a first year Thayer's Gull, but a small first year Herring Gull isn't completely eliminated by the description.

Lesser Black-backed Gull—

(#96-050) *Manitowoc Co.,* 20 May 1996.

A limited description of two black-backed gulls with yellow bills and yellow legs was given. These two individuals were larger than two nearby "juvenile" gulls which were of uncertain identity. Tentatively the juvenile birds were thought to be Herring Gulls, then possibly Ring-billed Gulls. Though the two birds are more than likely Lesser Black-backed Gulls, the uncertainty about their actual size left some confusion about the identification.

(#96-052) *Manitowoc Co.,* 3 April 1996, 14 April 1996.

A first year gull was described as smaller than the first year Great Black-backed Gull,, but similar in size to the first year Herring Gulls. The

back and wing coverts seemed darker than the Herrings' and the wings were felt to extend farther back at rest than the Herrings' wings. A black bill, and pinkish legs were also mentioned. Separating first and second year Herring and Lesser Black-backed Gulls is generally felt to be difficult. One feature consistently mentioned, but not described in these birds is the "double dark stripe" across the caudal secondary portion of the wing, formed by the dark secondaries and dark secondary coverts. Herring Gull's will show a single dark band only through the secondaries, not the coverts. Without this distinction, the identity of these birds is in doubt.

Royal Tern—

(#96-053) *Milwaukee Co.,* 26 May 1996.

In the midst of a Caspian Tern flock, a tern "15–20% smaller" than a Caspian Tern was noted. The overall plumage was similar in color except a narrower, orange bill that graded to orange- yellow at the tip. This bird was in breeding plumage, given its full black cap with barely detectable white feathering on the forehead. Though seen in flight, the underwing pattern was not clearly seen. This individual was more than likely a Royal Tern, but without a closer look at the bill and gonydeal angle, distinguishing this bird from an Elegant Tern is difficult. Apparently even the orange-yellow color is not necessarily a distinction between the two species. Observers should note that the bill color on Caspian Terns can be orange-red, necessitating a close look at the bill's shape and the caudal crest feathers to support the identity as "not a Caspian Tern," as was noted by this observer.

Arctic Tern—

(#96-054) *Oconto Co.,* 19 May 1996.

Though this bird was described as having an all red bill, shorter legs than the Common Terns, and a white patch on the side of the head contrasting with the gray breast, all of these traits are variably seen in Common Terns. The tail length was uncertain in this bird, but suggested to be "shorter than or equal to the tail length of the Common Tern." The tail should be markedly longer than the wings in an Arctic Tern, instead of the same length as the wings as in a Common Tern. The bird was not seen in flight to compare the extent of black in the underside of the primary tips.

(#96-055) *Manitowoc Co.,* 26 May 1996.

This intriguing description was by the observer's admission brief, but several characteristics point to a first year Arctic Tern. The primaries were gray in contrast to the anticipated dark gray of a first year Common Tern. The black bill seemed a bit smaller than those of the Common Terns. The legs were dark and seemed short in comparison to the Common Terns. As in a Common Tern, the head was black with a white forehead and there was a dark "carpal bar." The bird was not described in flight to determine the extent of the black in the underside of the primary tips. Unlike the adults, the tail of an immature Arctic Tern is not longer than the wings, negating this field mark as a distinction between Arctic and Common Terns.

Great Gray Owl—

(#96-056) *Town of Hortonia,* 9 February 1996.

Though a Great Gray Owl seen at 50 feet is not likely to be misidentified, this description is too incomplete to

suggest the identity of the bird. The only information reported is the size as large as or larger than a Great Horned Owl, with proportionately small eyes that "were not brown." Mention was not made of overall color, the presence of a white "moustache," the presence or lack of ear tufts.

Say's Phoebe—
(#96-058) *Milwaukee Co.,* 16 May 1996.

This unfortunately may have been a Say's Phoebe. Initially, the impression was that this bird was a robin because of the rusty abdomen, but the tips of unspecified "wing feather tips" were lighter than expected. It was felt to be the size of a robin, instead of smaller than a robin as a phoebe would be. The head, back, wings, and tail were dark tannish in color with a creamy throat and breast, void of streaks. The abdomen and sides were rust. The bill and eyes were black. The description is consistent with a Say's Phoebe except for the size reference, the lack of a darker or even blackish tail in comparison to the rest of the plumage, and for whatever reason the bird did not exhibit the anticipated tail pumping activity of a phoebe during the brief look afforded the observer.

Swainson's Warbler—
(#96-063) *Sheboygan Co.,* 18 May 1996.

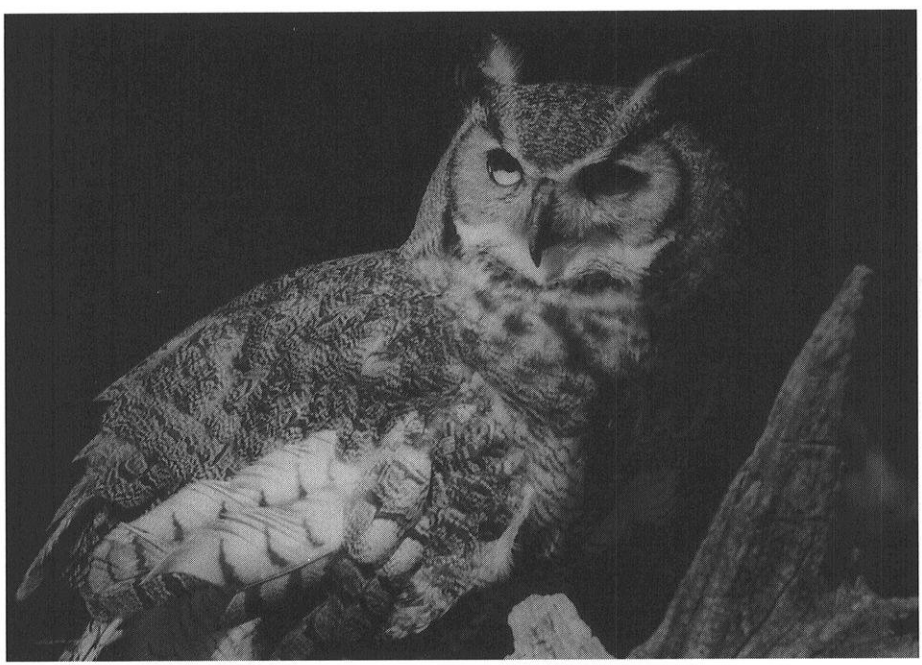
This intriguing report is unfortunately extremely brief. Given the rarity of this species and relatively bland field marks it has, extreme detail would be needed in a report of this nature. The bird was warbler-sized, with a dark line through the eye, a white stripe above the eye, a brown crown, back and tail brownish-green, underparts off-white, legs yellow, the bill slender. There was no description of its location, height off ground, habitat, activity, or comparison to any other species of bird. More detailed consideration of why this bird was not a waterthrush, Worm-eating Warbler, female Pine Warbler, female Black-throated Blue Warbler, or vireo would be important in a convincing documentation.

Blue Grosbeak—
(#96-067) *Ozaukee Co.,* 11,12 May 1996
(#96-068) *Waukesha Co.,* 18 May 1996.

Once again a couple of probably accurate sightings are missing a significant field mark that would nail down the identifications. The second bird was cardinal-sized, dark blue, black chinned, with dark wings, and a heavy bill. The anticipated chestnut wingbars were not noted. All of the other characteristics to distinguish a Blue Grosbeak from an Indigo Bunting are mentioned, but the most important distinction was not.

In the first report, this possible first year male was felt to be too large for an Indigo Bunting, but a more exact size reference was not made. The tail was light blue, underparts were beige, throat blue, wings brown, beak large, and there were spots on the head. Again the chestnut wingbars were not reported, though in this case, they would not be as striking against the background of a brown wing.

Jim Frank
WSO Records Committee Chair



Great-horned Owl *by Scott W. Mulcahy*

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Gerald H. Emmerich, Jr., is a serious amateur photographer who enjoys searching for the perfect nature photograph. He and his wife donated a portion of the Pickerel Lake Fen to The Nature Conservancy and he spends his time "hunting" for the perfect photo at the Fen, at Lulu Lake, and at his family's cottage near Eagle River. Gerry is also a 20-year member of the Image Makers Camera Club.

Laura Erickson is the hard-working compiler of the Spring field notes and author of *For the Birds: An Uncommon Guide.* She is working toward a Ph.D. in avian physiology and has received many awards and honors for her work in conservation.

Jim Frank has been one of WSO's most active contributors to Seasonal Field-Notes. He now assists WSO by compiling and summarizing the annual May Day Counts, Big Day Counts and Migration Day Counts and is the Records Committee Chair. He is a veterinarian in Milwaukee with an interest in avian medicine.

Jerry Gadamus has a B.S. degree from UW-Stout where he has instructed wildlife carving classes. A pioneer in techniques of "free hand" airbrush in wildlife art, he received the 1987 "Artist of the Year Award" from Northwoods Craftsman, who publishes his art.

Bettie Harriman is current President of WSO and coordinator of the Wisconsin Breeding Bird Atlas.

Phyllis Johnson is a retired Madison Area Technical College instructor. She taught technical writing and college transfer English and other classes. After she retired, she moved to the south shore of Lake Superior between Bark Bay slough and Lost Creeks' slough, to an area she calls birder's heaven. Phyllis is currently participating in the WSO Breeding Bird Survey, compiles the annual Bayfield county migration count, and has established a new South Shore Christmas Bird count. She writes about bird subjects for local publications.

Scott Mulcahy began his quest to learn photography and explore his fascination with nature about six years ago. Through his photography, he has enjoyed peace and tranquility while searching the outdoors for the next photo opportunity. As a photographer of nature, it is his aspiration to convey the spirit and beauty

of our land and wildlife untouched by man.

Sumner W. Matteson is an avian ecologist working in the non-game program of the Bureau of Endangered Resources of the Wisconsin Department of Natural Resources. He is a regular contributor to *The Passenger Pigeon.*

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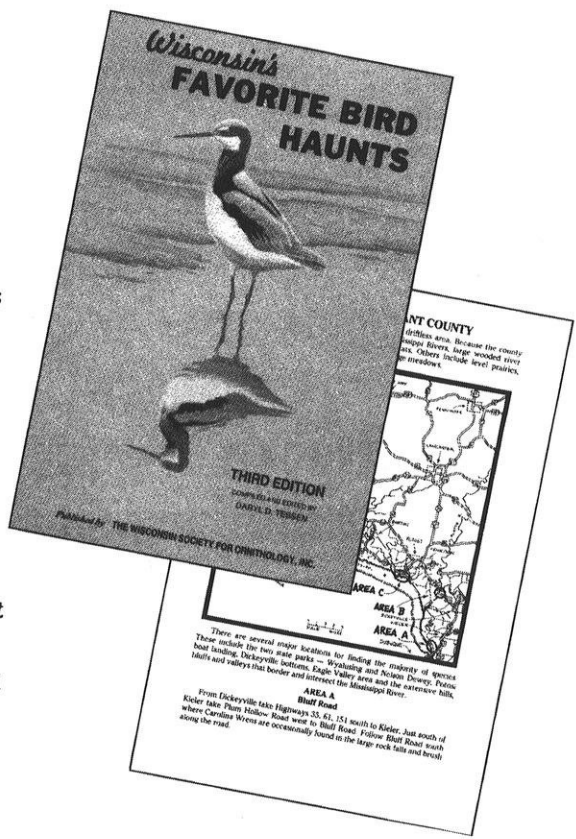

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