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THE *PASSENGER* *PIGEON*

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THE PASSENGER PIGEON

Vol. 59 No. 1

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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.

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Lest We Forget

On 11 May 1947, the Wisconsin Society for Ornithology dedicated a stone monument supporting a bronze plaque with the likeness of a Passenger Pigeon, *Ectopistes migratorius*, to the memory of the last member of this species which occurred in Wisconsin. That last Wisconsin Passenger Pigeon was shot at Babcock in September, 1899.

The Wisconsin Passenger Pigeon Monument sits atop a bluff in Wyalusing State Park, overlooking the Mississippi River, a migratory flyway once used by the millions of Passenger Pigeons that nested in vast forests of Wisconsin and neighboring areas. The plaque reads, in part, "This species became extinct through the avarice and thoughtlessness of man."

The very last Passenger Pigeon to live on this earth was "Martha," who spent her last 29 years in the aviary of the Cincinnati Zoo. When she died on 1 September 1914, her species became extinct. The announcement of her death from "Notes and News," *The Auk*, Vol. XXXI, Oct. 1914 states, "The reduction of this once abundant bird to absolute extermination by man's greed should be a lesson to us all and should stifle all opposition to the efforts now being made by national and state governments in behalf of the conservation of other birds threatened with a like fate."

I'm sure many persons would think it a very strange act to dedicate a monument to an extinct species. WSO's monument to the Passenger Pigeon, while honoring the memory of another creature that shared our earth, serves as a challenge to the human species not to let the same fate befall any other bird species.

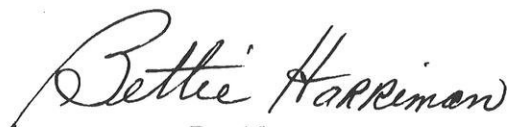
It has been 50 years since the monument was erected and dedicated, and the message to us, expressed by Walter E. Scott, WSO Vice-President in 1947, "to lend our efforts in the direction of the perpetuation of our native wildlife in its native habitat" remains as pressing today as it was fifty years ago. The reasons for the Passenger Pigeons' passing are as much a part of today's behavior as they were in the 1800s. Most of society still believes, or at least behaves as if it believes, that the immediate wants and desires of humans are more important than the long term welfare of the other species on this planet. When environmental decisions are made today, the "economic bottom-line" is all too often the deciding factor.

With a wish that society will not forget the message of the Passenger Pigeon, WSO rededicated the monument in Wyalusing State Park on 1 June 1997. As you open and read each issue of the WSO quarterly journal, *The Passenger Pigeon*, may you be reminded that a species once so numerous that it darkened the sky for hours at a time as a flock flew over can quite quickly be lost forever through the actions of humans. WSO remains committed to preventing the lost of any other avian species from our skies.

This is my last President's column. These two years have flown by very quickly and happily. The experience was made all the better by the other members of the WSO board. They are a wonderful group to work with and do a great job for our Society. I thank you for giving me the honor of serving WSO as President. I've loved every minute of it. Of course, you haven't heard the last from me, I will continue to serve on the WSO board as Publicity Chair and to be the Director of the Wisconsin Breeding Bird Atlas.

As my last official duty as President, I ask you to join me in welcoming Jim Anderson as your new President. Jim has been with Mosquito Hill Nature Center in Outagamie County since October 1974 as both a Naturalist and its Director. His vision and skills have made Mosquito Hill an outstanding center with an excellent educational program, creative research efforts, and a well-managed facility. I'm sure he will successfully bring his leadership abilities to WSO for his term as President.

With all best wishes for good birding,


Betty Harpman
President

The 1996 Wisconsin Christmas Bird Counts

Although weather was a factor in keeping the Christmas Counts from setting new records, there were a few highlights including a Christmas count first for Boreal Owl.

by William L. Hilsenhoff

November and early December were cold with periods of snow and occasional thawing. At the beginning of the Christmas Count period most, if not all, inland lakes were frozen and there was a good blanket of snow over the northern two-thirds of the state. The frozen terrain and water, a lack of snow in southern Wisconsin, and very strong winds on December 21 when 30% of the counts were made, had a detrimental effect on the results. Most species occurred in below average numbers; the only common species to occur in record numbers were the Snow Bunting and House Finch. Uncommon and rare species seemed to be unusually scarce on most counts; however, there were a few exciting discoveries. Heading the list was the Boreal Owl found on the Herbster count; this is the first record for this species on a Wisconsin Christmas count. Also exciting were an American White Pelican on the Lake Geneva count, the second Christmas count record for Wisconsin, and a Black Vulture seen within three days of the Kettle Moraine Count. The pelican was injured and

malnourished; it was captured, cared for, transported to Florida, and released where the species winters. Other highlights were a Trumpeter Swan sighted at Lakewood (seventh record), an injured Sandhill Crane (eighth record) that was captured at Green Lake, and Rose-breasted Grosbeaks (eighth record) found at Poynette and Kenosha. Found for the ninth time were a Marsh Wren on the Fond du Lac count, and a Black Scoter and Peregrine Falcon on the Milwaukee count. Great Black-backed Gulls on three Lake Michigan counts were the tenth record for that species. In spite of the apparent lack of rarities on most counts, 138 species were found, which is well above average.

LOCATION AND DETAILS OF THE COUNTS

Details of the weather and participation on each count are reported in Table 1. Weather during the count period often was either cold, snowy, or windy. Although there were 85 counts, participation was lower than in any of

Table 1. Details of the Counts.

Name of count	Date	Sky	Snow inches	Wind dir.	Wind mph.	Temp. °F		Observers			Party hours	Owling hours
						Low	High	Feeder	Field	Parties		
Appleton	12/21	Cloudy	1		10-30	14	27	13	28	21	132.00	2.00
Arpin	12/21	Cloudy	6	NW	5-10	20	26	1	8	4	24.50	1.50
Ashland	12/21	Cloudy	18		Calm	17	26	0	7	4	22.00	0.00
Baraboo	12/30	Cloudy	4	E	7	19	25	3	9	5	36.00	0.00
Bayfield	12/31	Cloudy	22		Calm	20	24	2	5	3	22.00	0.00
Beloit	12/28	Foggy	5		Calm	30	35	4	18	10	51.00	2.00
Black River Falls	12/28	Cloudy	8		Calm	24	30	12	4	2	14.25	1.50
Blanchardville	12/20	Clear-PCI	5	SW	5-20	0	14	0	8	4	38.50	3.25
Bridgeport	12/26	Snow-MCI	9	NW	15-8	-4	7	0	3	2	17.00	3.50
Brussels	12/28	Snow-MCI	10	SW	5-15	24	28	11	12	6	42.50	3.00
Burlington	1/1	Rain-Cloudy	2	WSW	5-15	28	33	0	2	2	19.00	3.00
Caroline	12/21	Cloudy	6	SW-W	5-20	17	28	8	5	3	15.00	0.00
Chippewa Falls	12/23	Cloudy	8		Calm	8	22	2	9	4	37.75	0.00
Clam Lake	1/3	Cloudy	28		Calm	27	32	0	9	4	36.50	2.75
Clyde	12/24	Cloudy-PCI	5	NW	0-10	9	26	0	4	3	30.00	0.00
Columbus	12/30	Cloudy-PCI	2		Calm	22		1	3	1	8.00	0.00
Cooksville	1/1	Drizzle-Cloudy	3	SW-W	10	27	35	1	6	3	16.00	1.50
Durand	12/21	Clear-Cloudy	tr.	SSW-S	15-5	12	30	0	12	6	28.25	0.00
Ephraim	12/21	Cloudy-MCI	1	SE-S	25-10	25	31	11	11	6	16.00	0.00
Fifield	12/28	Cloudy	18	SW	0-5	10	16	22	4	3	17.00	0.00
Fond du Lac	12/22	Cloudy	1	S	5-10	28	34	0	9	4	33.70	7.50
Fort Atkinson	1/4	Cloudy	tr.	NW	10-20	16	28	8	7	5	20.50	0.00
Fremont	1/1	Drizzle-Fog	11	SW-W	12-5	26	33	0	6	4	28.50	0.50
Gilman	12/29	Cloudy-MCI	15	N	5	10	15	4	8	5	43.50	2.50
Green Bay	12/21	Cloudy-MCI	tr.	SW	28-5	17	30	16	31	17	98.00	12.00
Green Lake	12/28	Cloudy	6	SW	5	20	32	0	14	5	24.75	3.50
Gurney	12/21	Cloudy	30		0-5	22	26	2	12	6	27.00	0.00
Hales Corners	12/22	Cloudy	2		30	35	1	16	6	6	29.50	0.00
Hartford	12/27	Cloudy	3		Calm	10	24	1	11	5	38.50	2.25
Herbster	12/28	Cloudy	24		0-10	13	17	6	4	3	13.00	1.00
Holcombe	12/28	Fog-Cloudy	18		Calm	4	12	0	5	3	19.00	0.00
Horicon Marsh	12/21	Cloudy	2	SW	25-10	22	33	0	10	4	26.00	0.00
Hudson	1/1	Fog-PCI	21	SW	6-9	26	31	0	9	4	17.50	0.00
Kenosha	12/24	Rain-MCI	tr.	SW-NW	26-8	18	28	0	1	1	9.00	0.00
Kettle Moraine	12/28	Fog-Cloudy	3		Calm	24	38	1	5	3	26.00	0.50
Kewaunee	12/29	Cloudy	1	NW	7-15	20	24	2	22	9	51.33	7.67
Kickapoo Valley	12/22	Cloudy	5	E	1-7	26	28	0	7	4	25.00	1.00
LaCrosse	12/21	Cloudy-PCI	6	S	5-10	25	27	2	19	12	63.25	1.70
Lake Geneva	12/21	Cloudy	0	S	15	11	33	6	15	9	23.00	1.00
Lakewood	12/28	Cloudy	15	SW	5-10	14	23	0	1	1	8.50	0.00
Luck	12/28	Snow	20	E-NE	15-25	-6	8	10	14	8	11.50	0.00
Madison	12/21	PCI-Clear	0		20-10	17	30	22	77	23	237.00	25.00
Manitowish Waters	12/29	Snow	24	NW	3-5	6	11	11	4	4	23.00	0.00
Medford	1/1	Cloudy	11	SW	0-10	19	29	1	7	4	33.50	0.50
Merrill	12/27	Cloudy	13	SE	2-4	-3	11	1	2	1	8.50	0.00
Milton	12/22	Clear	0	S	10-0	26	30	2	2	1	9.00	1.00
Milwaukee	12/21	Cloudy	1	SW	15	21	34	8	23	11	72.80	0.00
Montello	12/23	Cloudy	1	NE	18-25	27	29	10	5	4	26.00	3.00
Mount Horeb	12/29	Cloudy	6		0-5	20	35	9	32	16	94.50	2.00
New Franken	1/4	Rain-Drizzle	4	NW	10-15	34	35	3	5	4	7.00	2.00
New Richmond	12/21	Cloudy	15	S-NW	15-10	26	30	2	6	3	17.00	0.00
Oconomowoc	12/22	PCI-Cloudy	tr.		0-5	27	38	1	15	6	40.00	3.00
Oshkosh	12/21	Cloudy	tr.	SSW-S	26-15	21	30	1	16	11	65.00	0.50
Oxbo	12/21	Cloudy-PCI			15	19		11	5	1	8.00	0.00
Peshigo	12/21	Snow-PCI	4	S-SSE	20	20	29	0	6	3	27.00	0.00
Phelps	12/28	Cloudy	15	SW	5	15	25	3	4	3	18.00	1.00
Plainfield	12/27	Cloudy-Fog	9	W-S	5	-2	24	0	1	1	8.25	0.50
Platteville	12/22	Cloudy	1	SE	0-5	27	30	3	9	5	9.35	0.25
Plymouth	12/21	Cloudy	tr.	SW	15-25	20	31	2	11	5	31.50	0.00
Poynette	1/5	Cloudy	1	NW	20	15	25	18	23	12	78.25	2.25
Racine	12/28	Rain-Cloudy	2	WSW	5-10	33	38	6	16	5	36.00	3.00
Randolph	1/5	Snow	2	SW-NW	20-30	21	30	0	7	3	20.50	0.00
Rhineland	12/21	Cloudy-MCI	14	SE	10-20	8	26	25	3	1	8.00	0.00
Richland Center	12/21	Cloudy	2	SW-S	15-5			4	42	21	91.00	1.50
Riveredge	12/21	Cloudy	tr/	SW	10-15	10	30	38	67	22	223.00	25.50
Sauk City	12/28	Cloudy	2		Calm	28	34	1	30	12	75.00	6.00
Shawano	1/4	Cloudy	10	ENE	10-30	32	35	10	4	3	14.00	0.00
Shiocton	12/20	Clear-PCI	1	S	0-8	-5	12	5	12	5	32.25	0.00

(continued)

Table 1. Continued

Name of count	Date	Sky	Snow inches	Wind dir.	Wind mph.	Temp. °F		Observers			Party hours	Owling hours
						Low	High	Feeder	Field	Parties		
Spencer	12/22	Snow-Cloudy	14	N-E	5	24	30	4	14	7	55.00	5.75
Spruce	1/1	Fog-PCI	12	SSW-SW	18-5	30	31	1	4	2	19.00	1.00
Stockbridge	12/23	Fog-Sleet	1	NE	5-15	25	37	1	8	5	26.75	1.25
Sturgeon Bay	12/21	Snow-PCI	1	SW	25-10	24	30	32	32	14	71.00	2.00
Three Lakes	12/29	Snow	18	N	5	12	14	3	6	5	24.00	0.00
Trempealeau	12/21	Cloudy	6			20	36	5	16	7	54.00	1.00
Waukesha	12/21	Cloudy	tr/	S	12-23	23	33	2	25	9	76.00	5.50
Waupaca	12/27	Cloudy-Fog	11	SE	0-5	-8	12	0	1	1	9.00	0.50
Wausau	1/4	Rain-Sleet	12			29	33	13	15	10	24.75	0.00
Wautoma	12/31	Cloudy	12	NE	15-5	15	22	55	9	5	30.00	2.75
Willard	12/28	Mist-Cloudy	12	E-W	5	19	28	6	5	3	28.25	2.75
Wisconsin Rapids	12/21	Snow-Cloudy	16	SW	5-15	20	29	3	24	11	62.50	0.50
Woodland Dunes NW	1/4	Rain	6	NE	10-20	32	35	0	12	8	20.25	0.00
Woodland Dunes NE	1/5	Snow-Cloudy	3	W-NW	10-20	25	32	6	16	8	33.00	1.50
Woodland Dunes SW	12/21	Cloudy-MCI	1	S	15-25	20	28	0	14	9	35.50	1.00
Woodland Dunes SE	12/22	Cloudy	1	S	20-10	20	35	3	8	6	39.50	1.00
TOTAL								481	1,036	514	3,182.18	168.62

the preceding four years, with fewer field observers and party hours. There were four new counts this year, one at Herbster on the Lake Superior shore, and three others on the Door County Peninsula (Sturgeon Bay, Brussels, and New Franken). The Arpin, Fond du Lac, and Manitowish Waters counts, which were not included last year, were included this year. A second count was made at Herbster on the day before the count that is reported; it recorded 12 species, including 6 Red Crossbills. Reports of counts at Grantsburg, LaFarge, Pensaukee, and Stevens Point were not received, the Nelson count was made after the count period, and the Hofa Park count was not taken.

The location of each count is shown in Figure 1. Extra care was taken to accurately locate circles on the map. Centers of several counts have been moved slightly in recent years, which creates a danger of overlap. The Milton count overlaps two other counts, a situation that hopefully can be corrected. Counts are numbered in groups from north to south and west to east. An alphabetical listing of counts follows. It includes the count number (Figure 1),

the location of the count center, and the name, address, and telephone number of the compiler. Data from counts that include areas in other states are only for species and participation in Wisconsin.

Appleton (41); Jct. Hwys. 47 and 125; John Shillinglaw, 1952 Palisades Dr., Appleton, WI 54915; (920) 731-4222. **Arpin** (29); 1/2 mi. N Jct. Hwy. C and North Rd.; Dennis Seevers, 5969 Butternut Rd., Arpin, WI 54410; (715) 569-4260. **Ashland** (3); Jct. Hwys. 2 and 118; Dick Verch, 906 Ellis Ave., Ashland, WI 54806; (715) 682-5453. **Baraboo** (52); Jct. City View Rd. and Hwy. A; Raymond Dischler, 3830 Anchor Dr., Madison, WI 53714; (608) 249-4581 or 635-4326. **Bayfield** (2); T 50 N, R 5 W, S-22; Albert Roy, Jr., 906 Water St., Ashland, WI 54806; (715) 682-5334. **Beloit** (73); Jct. Tracy and Eau Claire Rd.; Brad Paulson, 15034 Carroll St., Broadhead, WI 53520; (608) 879-2647. **Black River Falls** (28); Jct. Hwys. H and 54; Judy Allen, W12866 River Rd., Black River Falls, WI 54615; (608) 488-4154. **Blanchardville** (56); 2.5 miles SW of Blanchardville; David Willard, Bird Division, Field Museum

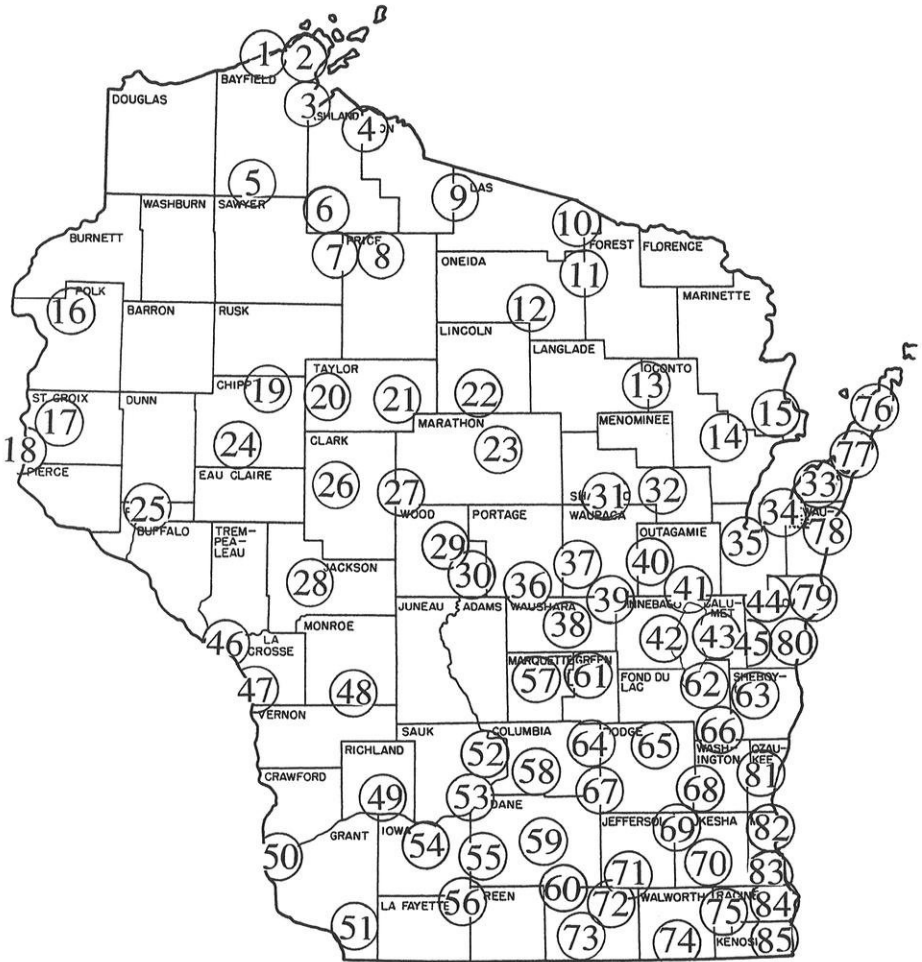


Figure 1. Locations of the 1996 Wisconsin Christmas bird counts.

of Natural History, Roosevelt Rd. at Lakeshore Dr., Chicago, IL 60605; (312) 922-9410 ext. 269 (work) or 663-3749. **Bridgeport** (50); Hwy. 18 bridge over Wisconsin R.; Al Shea, 2765 Northwynde Passage, Sun Prairie, WI 53590; (608) 825-6232. **Brussels** (33); Jct. Hwy. 57 and Stevenson Pier Rd.; Charlotte and Roy Lukes, 3962 Hillside Rd., Egg Harbor, WI 54209; (920) 823-2478. **Burlington** (75); Jct. Hwy A and Crossway Rd.; Gerald DeBoer, 15935 2

Mile Rd., Franksville, WI 53126; (414) 835-4642. **Cable** (5); Cable; Brad Donahue, P.O. Box 416, Cable, WI 54821; (715) 798-3890. **Caroline** (31); 2 miles W of Caroline; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Chippewa Falls** (24); Jct. Hwys. 178 and S; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723 3815. **Clam Lake** (6); 7 miles SE of Clam Lake; Keith Merkel, 11722 Robin Rd., Marshfield, WI 54449; (715) 384-

2383. **Clyde** (54); Jct. Hwy. ZZ and Weaver Rd.; Steven Greb, P.O. Box 63, Stoughton, WI 53589; (608) 873-7619. **Columbus** (67); Jct. Johnson and Jahnke Sts.; Larry Michael, 116 S. Nebraska St., Horicon, WI 53032; (920) 485-2936. **Cooksville** (60); Cooksville; David and Anna Marie Huset, 242 W. Church St., Evansville, WI 53536; (608) 882-5648. **Durand** (25); Jct. Hwys. 25 and DD 3 miles N of Durand; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723-3815. **Ephraim** (76); Hwy. A 3 miles S of Jct. with Hwy 42; Paul and Kathleen Regnier, P.O. Box 152, Baileys Harbor, WI 54202; (920) 839-2802 or 868-2690. **Fifield** (8); Fifield Post Office; Thomas Nicholls, 2160 Draper Ave., Roseville, MN 55113; (612) 636-2592. **Fond du Lac** (62); Jct. Tower and Cody Roads; Jeff Baughman, W8985 Hwy. SS, Adell, WI 53001; (414) 626-4713. **Fort Atkinson** (71); Jct. S. Main St. and Hackbarth Ave.; Richard Wanie, W5920 Lee Dr., Fort Atkinson, WI 53538; (920) 563-6274. **Fremont** (39); Jct. Hwys. I and HH 4 miles SW of Fremont; Daryl Tessen, 3118 N. Oneida St., Appleton, WI 54911; (920) 735-9903. **Gilman** (20); 1 mile W of Miller Dam; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Grantsburg** (no report); Jct. Hwys. 70 and 48; Dennis Allaman, 506 W. St. George, Grantsburg, WI 54840; (715) 463-2366. **Green Bay** (35); Jct. Allouez and S. Webster Avenues; John Jacobs, Neville Public Museum, 210 Museum Pl., Green Bay, WI 54303; (920) 448-4460. **Green Lake** (61); Jct. Hwy. J and Swamp Rd.; Thomas Schultz, N6104 Honeysuckle Lane, Green Lake, WI 54941; (920) 294-3021. **Gurney** (4); Gurney; Joan Elias, HCR 780, Saxon, WI 54559; (715) 893-2358. **Hales Cor-**

ners (83); Jct. Hwy 41 and Puetz Rd. (Milwaukee Co. only); Mariette Nowak, Wehr Nature Center, 9701 W. College Ave., Franklin, WI 53123; (414) 524-8550. **Hartford** (68); Jct. Hwys. 60 and 83; Judy Haseleu, 337 W. State St., Hartford, WI 53027; (414) 673-5865. **Herbster** (1); Hwy. 13, 1 mile west of Herbster; Phyllis Johnson, P.O. Box 303, Cornucopia, WI 54827; (715) 742-3960. **Hofa Park** (not taken); Jct. Hofa Park Dr. and Parkview; Elaine Friedrick, W1776 Hofa Park Dr., Seymour, WI 54165; (920) 822-3016. **Holcombe** (19); Chippewa-Rusk county line 1 mile E of Hwy. 27; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723-3815. **Horicon Marsh** (65) Jct. Main Ditch and Main Dike in Refuge; Bill Volkert, DNR, N7725 Hwy. 28, Horicon, WI 53032; (920) 387-7877. **Hudson** (18); Afton, MN; Helen Lien, 5148 29th Ave. S., Minneapolis, MN 55417; (612) 729-5982. **Kenosha** (85); Jct. Hwys. 158 and HH (Kenosha Co. only); Ron Hoffmann, Box 886, Kenosha, WI 53141; (414) 654-5854. **Kettle Moraine** (66); Hwy. DD, W of Auburn Lake; Bill Volkert, DNR, N7225 Hwy. 28, Horicon, WI 53032; (920) 387-7877. **Kewaunee** (78); Jct. Hwys. 42 and D; William Mueller, 1242 S. 45 St., Milwaukee, WI 53214; (414) 643-7279. **Kickapoo Valley** (48); Jct. Hwys. T and 131; Eric Epstein, Rt. 2, Box 455, Norwalk, WI 54648; (608) 823-7837. **LaCrosse** (47); LaCrosse Courthouse; Fred Leshner, 509 Winona St., LaCrosse, WI 54603; (608) 783-1149. **LaFarge** (no report); Jct. Hwys. 131 and 82; Dan Hazlett, P.O. Box 264, LaFarge, WI 54639. **Lake Geneva** (74); Interlaken Resort, Hwy. 50; Patricia Parsons, N3241 North Williams St., Lake Geneva, WI 53147; (414) 248-1232. **Lakewood** (13); Jct. Hwys. T and

FR 2117; John Woodcock, 1718 Cedar Grove Dr., Apt. 3A, Manitowoc, WI 54220; (920) 684-0447. **Luck** (16); Jct. Roads 180th St. and 180th Ave. in Polk Co.; John Nygren, 920 3rd Ave., Luck, WI 54853; (715) 472-2508. **Madison** (59); State Capitol; Carol Anderson and Tony Kalenic, 4638 Bonner Lane, Madison, WI 53704; (608) 249-8836. **Manitowish Waters** (9); Jct. Hwy. 51 and Hwy. W; John Bates, Hwy. 47, #2263, Mercer, WI 54547; (715) 476-2828. **Medford** (21); 1.5 mi. E and 0.5 mi. N of Jct. Hwys. 13 and M east; Michael Riegert, N763 Oriole Dr., Stetsonville, WI 54480; (715) 678-2627. **Merrill** (22); Jct. South End Rd. and Hwy. 107; Alan Rusch, 3342 Westview Lane, Madison, WI 53713; (608) 274-1224. **Milton** (72); Milton; Katy Hess, P.O. Box 81, Milton, WI 53563; (608) 868-2972. **Milwaukee** (82); Jct. Port Washington Rd. and Hampton Ave.; Marilyn Bontly and Jean Streika, Schlitz Audubon Center, 1111 E. Brown Deer Rd., Milwaukee, WI 53217; (414) 352-2663. **Montello** (57); Harrisville; Daryl Christensen, N6053 Hwy. Y, Montello, WI 53949; (608) 296-3068. **Mount Horeb** (55); Mount Horeb; Sharon & Warren Gaskill, 10405 Bell Rd., Black Earth, WI 53515; (608) 767-3642. **Nelson** (after period); 1 mile S of Jct. Hwys. I and D; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723-3815. **New Franken** (34); Jct. Hwys. P and SS; Ed Houston, 2818 Sugarbush Ct., Green Bay, WI 54301; (920) 339-3273. **New Richmond** (17); 2 miles E of Boardman; Joseph Merchak, 210 Ilwaco Rd., River Falls, WI 54022; (715) 425-1169. **Oconomowoc** (69); Hwy 67, 2 miles N of Oconomowoc; Alex Kailing, W330 N8275 W. Shore Dr., Hartland, WI 53029; (414) 966-1072. **Oshkosh** (42); Jct. Hwys. 21

and 41; Thomas Ziebell, 1322 Ceape Ave., Oshkosh, WI 54901; (920) 235-0326. **Oxbo** (7); Jct. Hwys. EE and 70; Larry Gregg, 829 Atwood Ave., Park Falls, WI 54552; (715) 762-3446. **Pensaukee** (no report); Pensaukee; Thomas Erdman, 4093 Hwy. S, Route 2, Oconto, WI 54153; (920) 834-3416. **Peshtigo** (15); Harmony Corners; Leo Feller, 530 Rainbow Circle, Peshtigo, WI 54157; (715) 582-3373. **Phelps** (10); Jct. FR 2199 and FR 2533, 2 miles SW of Phelps; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479-8055. **Plainfield** (29); Jct. Hwy. BB and 3rd Ave. NW of Almond; Don Nussbaum, 1544 Ames St., Neenah, WI 54956; (920) 729-9137. **Platteville** (51); Cornelia; Tom Goltry, 660 Pioneer Rd., Platteville, WI 53818; (608) 348-9666. **Plymouth** (63); Jct. Hwys. 23 and Country Aire Rd.; Harold Koopman, 415 Caroline St., Plymouth, WI 53073; (920) 892-8101. **Poynette** (58); Jct. Hwys. 51 and CS; Mark & Sue Martin, Goose Pond Sanctuary, W7468 Prairie Lane, Arlington, WI 53911; (608) 635-4160. **Racine** (84); Hwy. H 0.5 miles S of Hwy. K (Racine Co. only); Gerald DeBoer, 15935 2 Mile Rd., Franksville, WI 53126; (414) 835-4642. **Randolph** (64); Hwy P midway between Cambria and Randolph; Larry Michael, 116 S. Nebraska St., Horicon, WI 53032; (920) 485-2936. **Rhineland** (12); Rhineland; Ced Vig, 919 Birch Bend, Rhineland, WI 54501; (715) 362-3047. **Richland Center** (49); Jct. Hwys. O and TB SE of Richland Center; Robert Hirschy, University of Wisconsin Center-Richland, 1200 Hwy. 14 West, Richland Center, WI 53581; (608) 647-6186. **Riveredge** (81); Jct. Hwy. 33 and Lakeland School Rd.; John Rank, c/o Riveredge Nature Center, P.O. Box 26, Newburg, WI 53060; (414) 375-2715.

Sauk City (53); 2.5 miles SE of Witwen; Becky Isenring, 6869 Taylor Road, Sauk City, WI 53583; (608) 643-6906. **Shawano** (32); 3 miles N of Lunds; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Shiocton** (40); Jct. Hwys. M and 54; James Anderson, Mosquito Hill Nature Center, N3880 Rogers Rd., New London, WI 54961; (920) 779-6433. **Spencer** (27); Jct. Hwys. F and 153; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Spruce** (14); 1 1/2 miles N of Spruce on Hwy. B; Jerry Smith, 6865 Fredrickson Road, Lena, WI 54139; (920) 829-6353. **Stevens Point** (no report); Old Main, U.W.-Stevens Point; Nancy Stevenson, 1890 Red Pine Lane, Stevens Point, WI 54481; (715) 341-0084. **Stockbridge** (43); 3 miles SE of Stockbridge; Carroll Rudy, W3866 Hwy. H, Chilton, WI 53014; (920) 849-9021. **Sturgeon Bay** (77); Jct. Hwys. 57 and P; Roy and Charlotte Lukes, 3962 Hillside Rd., Egg Harbor, WI 54209; (920) 823-2478. **Three Lakes** (11); 6 miles E of Three Lakes; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479-8055. **Trempealeau** (46); Jct. Hwy K and Fremont St., Trempealeau; Thomas Hunter, 11675 Jay St., Trempealeau, WI 54661; (608) 534-6233. **Waukesha** (70); Jct. Hwy. D and Brookhill Rd.; Patrick Horn, 376W19840 Sunny Hill Dr., Muskego, WI 53150; (414) 679-1459. **Waupaca** (37); Jct. Hwy. 49 & Smokey Valley Rd.; Daryl Tessen, 3118 N. Oneida St., Appleton, WI 84911; (920) 735-9903. **Wausau** (23); Jct. Grand Ave. and Thomas St.; Walter Tamminen, 1224 N 4th Ave., Wausau, WI 54401; (715) 675-7669. **Wautoma** (38); Mount Morris; Delbert Greenman, 1218 Hwy W, Redgranite, WI 54970; (920) 787-3036. **Willard** (26); 1 mile E and 1.5

miles S of Willard; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Wisconsin Rapids** (30); Wisconsin Rapids Airport; LaVonne and Dave Middleton, 210 Shorewood Ter., Wisconsin Rapids, WI 54494; (715) 423-3242. **Woodland Dunes NW** (44); Menchalville; **NE** (79); Mishicot; **SW** (45); 3 miles W of St. Nazianz on Hwy. C; **and SE** (80); 2 mi. S of Newtonburg; all in Manitowoc Co. as drawn on a map; Bernard Brouchoud, Woodland Dunes Nature Center, P.O. Box 2108, Manitowoc, WI 54221-2108; (920) 793-4007.

RESULTS OF THE COUNTS

Results are reported in Tables 2-8. Common species are reported in Tables 2-7, with counts in similar areas of the state grouped together in each table. The number of individuals of each species is compared in Table 7 with the average for the previous ten years, corrected for participation (total party hours). Numbers of uncommon and rare species are reported in Table 8, with counts of each species listed in the same order as in Tables 2-7. Undocumented reports of species for which documentation was requested were not compiled. Some other reports of species were not included because documentation was inadequate or indicated the identification was in error.

Most counts recorded fewer species than in the past few years. The Madison count found the greatest number of species (78), followed by counts at Riveredge (77), Poynette (70), Milwaukee (69), Appleton (66) and Kenosha (63). Only five other counts had fifty or more species, and twenty counts reported less than 30 species. A summary

Table 2. Number of each species in northern Wisconsin found on 16 or more counts.

Species	Herbster	Bayfield	Ashland	Gurney	Cable	Clam Lake	Oxbo	Fifield	Manitowish Waters	Phelps	Three Lakes	Rhindlander	Lakewood	Spruce	Peshigo
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	1	x	0	0	0	0	0	0	0	0	0	24
American Black Duck	0	0	32	0	0	0	0	0	0	0	0	0	0	0	4
Mallard	0	0	105	0	0	0	0	0	1	0	0	101	0	0	20
Common Goldeneye	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Common Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Bald Eagle	2	1	2	7	2	0	2	1	4	1	0	3	0	1	4
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sharp-shinned Hawk	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Cooper's Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Red-tailed Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5
Rough-legged Hawk	0	0	2	0	0	0	4	1	0	0	0	0	1	3	13
American Kestrel	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Ring-necked Pheasant	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2
Ruffed Grouse	1	3	4	5	6	14	24	13	8	11	4	9	0	1	3
Wild Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull	28	4	56	0	0	0	0	0	0	0	0	0	0	0	0
Rock Dove	0	14	81	10	0	0	0	38	0	0	0	37	0	473	115
Mourning Dove	4	34	28	5	0	0	6	45	0	0	25	74	6	269	125
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Barred Owl	0	0	1	0	2	1	1	0	0	1	1	0	0	0	0
Belted Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-headed Woodpecker	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Red-bellied Woodpecker	0	0	0	0	0	0	0	0	0	0	0	1	0	4	10
Downy Woodpecker	7	9	4	8	11	7	33	16	19	28	21	36	3	13	14
Hairy Woodpecker	10	3	5	7	9	11	35	24	18	29	7	36	1	12	10
Northern Flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pileated Woodpecker	5	2	x	x	2	3	7	4	1	5	0	6	0	0	1
Horned Lark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Jay	63	178	78	52	64	109	134	154	104	76	17	78	33	106	88
American Crow	0	28	68	33	17	55	30	106	63	29	13	9	19	167	240
Common Raven	25	73	8	56	9	122	18	19	40	35	7	0	3	6	24
Black-capped Chickadee	165	132	139	127	152	232	277	460	305	274	139	267	49	154	271
Tufted Titmouse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Nuthatch	22	26	2	7	32	119	18	50	51	77	42	54	4	0	9
White-breasted Nuthatch	11	3	3	12	11	7	30	26	48	19	3	59	0	11	24
Brown Creeper	0	0	0	0	2	3	0	3	2	5	1	1	0	2	1
Golden-crowned Kinglet	0	0	0	0	0	23	0	5	0	0	1	0	0	0	2
American Robin	5	46	16	0	0	0	0	1	0	0	0	0	0	0	0
Cedar Waxwing	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Northern Shrike	3	1	4	1	0	3	0	0	0	0	0	0	0	1	2
European Starling	21	92	235	41	0	0	0	88	0	30	3	0	12	402	999
Northern Cardinal	1	1	2	0	x	0	1	6	0	0	0	1	0	17	7
American Tree Sparrow	1	0	0	3	0	2	4	4	3	1	0	2	0	123	21
Song Sparrow	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
White-throated Sparrow	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
Dark-eyed Junco	0	26	2	0	21	6	1	42	4	22	1	102	2	42	102
Snow Bunting	0	0	0	47	0	0	13	x	0	2	100	12	0	217	415
Common Grackle	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Purple Finch	68	23	16	9	73	114	158	59	63	94	14	77	0	17	3
House Finch	0	73	106	0	0	0	0	2	0	0	0	1	0	46	15
Common Redpoll	9	30	0	0	0	0	6	12	0	0	0	0	0	0	0
Pine Siskin	0	0	0	0	1	109	12	x	5	4	206	20	0	0	0
American Goldfinch	91	83	56	22	59	158	68	27	122	176	32	167	4	192	113
Evening Grosbeak	74	21	2	36	71	46	83	88	14	179	54	116	42	0	0
House Sparrow	0	5	59	0	0	0	6	3	0	0	0	0	0	333	267
Total Species	24	27	30	23	20	27	28	33	23	25	24	27	15	30	44

x = Found within 3 days of the count day but not on the day of the count.

Table 3. Number of each species in west-central and central Wisconsin found on 16 or more counts.

Species	Luck 16	New Richmond 17	Hudson 18	Holcombe 19	Gilman 20	Medford 21	Merrill 22	Wausau 23	Chippewa Falls 24	Durand 25	Willard 26	Spencer 27	Black River Falls 28	Arpin 29	Wisconsin Rapids 30
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	574	145	0	0	0	0	0	0	0	0	0	0	0	27
American Black Duck	0	0	12	0	0	0	4	x	23	0	0	0	0	0	30
Mallard	0	93	309	0	0	15	425	59	298	0	0	0	0	0	401
Common Goldeneye	0	31	91	0	0	0	0	x	0	0	0	0	0	0	340
Common Merganser	0	1	46	0	0	0	0	9	0	0	0	0	0	0	18
Bald Eagle	4	7	6	1	4	1	3	1	1	9	1	2	3	2	2
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sharp-shinned Hawk	0	0	1	0	0	0	0	0	0	0	0	1	0	1	3
Cooper's Hawk	0	0	1	0	0	0	0	x	0	0	0	1	0	0	4
Red-tailed Hawk	1	3	6	2	1	0	0	1	19	22	20	27	6	27	17
Rough-legged Hawk	0	2	0	0	9	0	1	0	5	4	3	6	2	16	11
American Kestrel	0	1	0	0	0	0	0	0	0	0	1	2	0	0	0
Ring-necked Pheasant	6	5	2	0	3	2	0	0	2	2	4	5	1	1	1
Ruffed Grouse	3	1	1	0	2	19	0	6	3	0	8	16	6	10	5
Wild Turkey	13	1	15	0	0	0	0	4	0	72	57	0	114	23	11
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Herring Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Dove	12	188	145	46	237	103	19	65	381	437	270	666	26	514	106
Mourning Dove	12	4	1	0	35	22	29	155	65	38	27	150	5	42	77
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	0	0	0	x	0	0
Great Horned Owl	0	1	2	0	0	0	0	0	2	0	9	3	4	x	0
Barred Owl	1	0	0	0	0	0	0	0	0	0	2	4	1	2	0
Belted Kingfisher	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Red-headed Woodpecker	0	0	0	0	0	0	0	0	12	0	16	1	1	2	1
Red-bellied Woodpecker	13	4	3	0	2	4	0	4	12	11	8	5	19	6	2
Downy Woodpecker	46	16	23	5	35	29	3	56	47	38	67	87	30	16	11
Hairy Woodpecker	29	11	2	2	54	21	2	21	24	16	25	24	17	5	9
Northern Flicker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pileated Woodpecker	7	2	1	0	3	4	0	1	2	2	2	0	3	1	x
Horned Lark	0	0	0	3	0	6	0	0	0	0	3	3	0	0	0
Blue Jay	109	103	57	100	317	219	15	41	313	108	501	231	92	55	161
American Crow	72	482	204	85	763	371	49	149	427	706	206	266	143	152	539
Common Raven	0	0	0	2	50	14	6	0	0	0	9	0	0	0	x
Black-capped Chickadee	159	89	87	152	749	828	64	219	336	118	537	592	140	122	304
Tufted Titmouse	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0
Red-breasted Nuthatch	15	3	1	0	29	34	x	24	2	1	25	9	25	4	10
White-breasted Nuthatch	56	24	10	4	25	24	3	24	42	32	60	46	69	8	17
Brown Creeper	1	1	0	0	4	0	0	4	0	0	0	1	1	1	1
Golden-crowned Kinglet	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
American Robin	0	12	0	0	0	7	1	x	3	0	0	0	2	2	0
Cedar Waxwing	0	50	57	0	0	0	0	x	0	0	0	x	7	0	0
Northern Shrike	0	4	1	3	8	1	0	x	0	2	3	7	2	7	3
European Starling	40	237	313	125	224	7079	47	102	1	660	559	2214	11	521	8
Northern Cardinal	73	69	39	1	8	13	6	69	289	40	44	57	53	36	31
American Tree Sparrow	12	21	0	3	30	6	0	2	63	77	33	48	21	20	24
Song Sparrow	38	0	0	0	0	0	0	0	29	0	0	0	0	0	1
White-throated Sparrow	2	3	0	0	0	0	0	0	0	0	0	0	1	0	x
Dark-eyed Junco	55	40	50	0	7	17	x	43	80	208	83	49	191	51	90
Snow Bunting	20	0	0	0	48	54	0	0	0	133	137	79	0	348	x
Common Grackle	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purple Finch	0	43	4	0	7	42	0	7	1	0	5	76	31	3	18
House Finch	5	3	60	0	2	50	27	76	167	170	12	0	1	2	25
Common Redpoll	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
Pine Siskin	0	0	2	0	0	0	0	x	0	0	0	1	0	0	0
American Goldfinch	128	91	15	45	3	39	3	48	66	89	108	64	197	49	109
Evening Grosbeak	0	0	0	0	51	5	18	0	0	0	0	0	0	0	0
House Sparrow	190	661	184	78	387	919	155	254	679	253	2063	1955	61	276	89
Total Species	30	38	37	18	32	30	20	26	32	27	36	38	33	33	37

x = Found within 3 days of the count day but not on the day of the count.

Table 4. Number of each species in east-central Wisconsin found on 16 or more counts.

Species	Caroline 31	Shawano 32	Brussels 33	New Franken 34	Green Bay 35	Plainfield 36	Waupaca 37	Wautoma 38	Fremont 39	Shiocton 40	Appleton 41	Oshkosh 42	Stockbridge 43	Woodland Dunes NW 44	Woodland Dunes SW 45
Great Blue Heron	0	0	1	0	0	1	0	1	0	2	0	0	0	0	0
Canada Goose	0	0	15	38	3372	0	2	3	0	0	2926	27	0	0	22
American Black Duck	0	0	0	0	389	0	7	1	18	0	80	18	1	0	0
Mallard	149	0	0	0	2456	-	76	190	275	0	2245	1333	0	46	13
Common Goldeneye	0	5	0	0	3	0	0	0	6	0	482	16	0	0	0
Common Merganser	1	5	3	0	41	0	0	0	20	3	175	21	0	0	0
Bald Eagle	3	1	0	0	3	0	0	2	1	2	24	2	0	0	0
Northern Harrier	0	1	x	0	3	0	0	0	0	3	4	1	0	2	1
Sharp-shinned Hawk	1	0	1	2	2	0	0	2	0	1	4	2	1	0	1
Cooper's Hawk	0	0	1	0	7	0	0	0	2	2	8	5	1	0	0
Red-tailed Hawk	5	2	18	2	57	4	10	13	30	32	77	29	5	6	17
Rough-legged Hawk	4	2	6	0	0	1	5	33	37	2	13	1	1	5	7
American Kestrel	0	0	4	4	23	0	1	2	9	5	24	24	9	0	19
Ring-necked Pheasant	0	5	1	0	1	0	0	3	8	1	11	2	2	1	0
Ruffed Grouse	14	8	0	0	0	0	0	6	1	0	0	0	x	3	1
Wild Turkey	17	6	29	0	0	25	90	478	0	0	18	3	38	26	141
Ring-billed Gull	0	0	0	0	11	0	0	0	0	0	15	9	1	8	4
Herring Gull	0	0	0	5	172	0	0	0	0	0	80	20	1	223	16
Rock Dove	145	76	228	1	1356	65	70	148	854	358	1475	485	209	169	307
Mourning Dove	107	103	207	82	815	2	7	186	649	217	1221	787	61	3	18
Eastern Screech-Owl	1	0	0	0	3	0	0	1	1	0	1	1	0	0	0
Great Horned Owl	0	1	2	x	8	0	0	4	4	2	11	5	x	1	1
Barred Owl	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0
Belted Kingfisher	1	2	0	0	1	0	0	2	0	0	2	0	0	0	0
Red-headed Woodpecker	0	2	4	x	1	0	2	13	0	0	0	0	0	0	0
Red-bellied Woodpecker	6	3	6	7	24	0	5	35	11	16	17	10	5	0	3
Downy Woodpecker	18	21	24	15	66	3	13	76	40	59	74	68	43	3	14
Hairy Woodpecker	8	20	19	8	34	0	9	31	9	16	23	6	8	1	3
Northern Flicker	0	0	0	0	0	0	0	8	4	0	2	0	1	0	2
Pileated Woodpecker	1	3	1	1	1	1	1	4	1	0	0	0	1	0	1
Horned Lark	4	10	1	2	0	8	0	1	40	0	27	12	80	1	10
Blue Jay	65	110	72	26	108	77	161	566	113	114	95	48	59	23	33
American Crow	125	169	252	17	490	116	192	1010	200	296	334	272	14	136	146
Common Raven	1	4	6	2	0	0	0	0	0	2	0	0	0	0	0
Black-capped Chickadee	189	231	95	47	178	24	115	452	280	316	206	98	144	64	95
Tufted Titmouse	0	0	0	0	0	0	0	x	0	0	0	0	0	0	0
Red-breasted Nuthatch	15	10	0	1	10	0	0	25	1	4	5	x	0	0	2
White-breasted Nuthatch	33	28	17	14	66	1	16	82	33	40	60	22	24	5	11
Brown Creeper	7	4	0	3	5	0	0	1	6	3	22	6	3	0	0
Golden-crowned Kinglet	0	0	0	0	3	0	0	0	2	0	1	6	0	2	0
American Robin	0	0	1	1	22	0	0	20	0	6	11	1	1	0	0
Cedar Waxwing	0	0	0	1	0	0	0	24	0	0	102	0	0	0	0
Northern Shrike	1	1	1	x	2	0	1	4	6	7	4	1	0	0	2
European Starling	70	124	395	54	1281	8	502	1081	551	799	1049	684	604	59	311
Northern Cardinal	41	32	31	26	132	3	26	145	44	68	136	78	39	17	7
American Tree Sparrow	74	137	72	13	53	15	82	360	474	144	209	366	49	178	36
Song Sparrow	0	x	0	0	6	0	0	0	0	0	1	0	0	0	0
White-throated Sparrow	0	0	0	0	4	0	0	1	0	1	2	x	0	0	0
Dark-eyed Junco	151	229	99	76	206	174	301	1004	352	241	406	145	84	90	53
Snow Bunting	0	87	330	55	0	0	0	0	76	0	155	0	695	70	0
Common Grackle	0	0	0	0	1	0	0	0	1	1	1	x	0	0	0
Purple Finch	23	5	4	8	20	0	0	55	0	0	7	13	0	0	0
House Finch	94	38	32	65	404	50	2	157	158	84	649	204	4	11	4
Common Redpoll	12	4	0	0	26	0	0	7	0	0	1	0	0	0	0
Pine Siskin	320	54	6	0	19	0	0	2	0	0	1	0	0	15	3
American Goldfinch	127	306	107	75	137	20	91	181	122	82	114	116	16	24	19
Evening Grosbeak	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
House Sparrow	160	38	539	57	1865	65	140	197	1014	522	1114	1956	1444	68	225
Total Species	37	40	38	34	54	21	26	48	46	36	66	43	33	30	37

x = Found within 3 days of the count day but not on the day of the count.

Table 5. Number of each species in southwest and south-central Wisconsin found on 16 or more counts.

Species	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Great Blue Heron	3	1	0	0	0	1	1	1	0	x	1	0	0	2	0
Canada Goose	3	33	0	0	0	0	931	111	0	210	0	1373	279	5934	8
American Black Duck	2	5	0	0	0	0	2	0	0	0	0	20	10	48	2
Mallard	27	1025	0	47	0	0	387	430	29	9	7	575	334	3784	211
Common Goldeneye	1	0	0	0	0	0	60	12	0	0	0	1	20	35	2
Common Merganser	0	270	0	3	0	0	6	131	0	0	0	1	23	116	1
Bald Eagle	47	130	x	38	6	26	4	23	0	1	0	1	6	9	1
Northern Harrier	1	0	0	11	0	0	0	0	0	0	0	3	0	2	0
Sharp-shinned Hawk	1	2	1	2	0	2	0	2	0	1	1	1	1	7	1
Cooper's Hawk	2	1	2	1	0	0	0	3	0	1	1	1	5	14	x
Red-tailed Hawk	22	35	51	89	30	27	31	92	8	80	88	16	58	104	15
Rough-legged Hawk	8	0	5	32	5	0	34	44	2	29	4	12	20	3	1
American Kestrel	1	6	5	10	4	8	1	20	2	10	3	1	6	7	8
Ring-necked Pheasant	0	1	0	3	11	2	0	13	1	10	8	2	39	22	1
Ruffed Grouse	6	1	4	14	1	0	0	6	x	0	1	2	4	0	0
Wild Turkey	30	160	312	517	78	0	262	354	115	270	84	189	264	20	53
Ring-billed Gull	0	0	0	0	0	0	0	2	0	0	0	0	15	30	0
Herring Gull	0	1	0	0	0	0	0	0	0	0	0	0	5	36	0
Rock Dove	344	238	594	805	98	150	321	1343	191	208	78	107	404	762	60
Mourning Dove	128	182	19	129	7	34	113	760	12	140	69	25	264	759	175
Eastern Screech-Owl	0	4	0	0	4	0	0	8	0	1	2	x	0	46	4
Great Horned Owl	1	0	6	1	5	2	1	9	0	8	16	1	3	11	0
Barred Owl	4	3	0	0	2	2	0	1	0	0	1	1	1	0	2
Belted Kingfisher	1	2	9	0	1	2	0	2	0	0	4	2	1	5	2
Red-headed Woodpecker	0	0	0	7	0	0	1	1	0	1	2	6	0	1	0
Red-bellied Woodpecker	25	23	16	40	41	10	15	66	2	33	36	10	44	72	7
Downy Woodpecker	62	54	21	65	37	13	36	129	11	79	66	20	90	263	40
Hairy Woodpecker	20	15	3	23	6	4	13	26	3	49	22	8	30	70	4
Northern Flicker	1	1	1	5	1	1	0	6	0	5	1	2	2	3	0
Pileated Woodpecker	2	4	4	8	0	0	8	14	0	6	0	1	3	0	0
Horned Lark	0	0	30	0	148	3	19	39	0	12	19	0	144	0	67
Blue Jay	172	87	94	169	63	39	20	227	13	81	81	144	136	169	28
American Crow	229	458	365	1609	49	110	514	587	116	454	286	258	1293	2601	140
Common Raven	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Black-capped Chickadee	257	321	159	392	174	106	185	440	113	229	228	101	545	1130	57
Tufted Titmouse	0	6	5	9	24	8	x	20	0	14	4	1	28	5	3
Red-breasted Nuthatch	3	1	1	0	0	2	0	13	x	1	2	1	15	9	1
White-breasted Nuthatch	57	85	17	83	37	12	10	119	12	66	89	26	95	201	16
Brown Creeper	3	6	3	1	3	0	1	7	0	0	2	x	10	40	1
Golden-crowned Kinglet	0	0	0	2	0	0	0	2	0	0	3	0	12	9	0
American Robin	1	275	0	0	1	0	0	0	0	2	0	0	3	107	0
Cedar Waxwing	6	0	0	0	0	2	76	36	0	3	0	93	96	169	0
Northern Shrike	2	0	2	3	0	0	7	2	0	0	0	5	4	4	1
European Starling	678	1290	529	1173	103	328	156	1969	213	430	513	83	366	2825	329
Northern Cardinal	125	125	132	216	177	31	57	341	14	146	123	82	169	509	160
American Tree Sparrow	152	160	124	384	441	26	611	869	62	352	1000	32	613	593	460
Song Sparrow	0	0	1	8	2	2	1	14	1	12	17	0	13	33	6
White-throated Sparrow	0	0	0	1	0	2	0	1	0	0	1	0	2	23	1
Dark-eyed Junco	273	339	421	613	538	188	578	912	187	460	604	291	1262	1329	177
Snow Bunting	0	30	0	150	230	15	0	0	0	0	2	x	8040	1	0
Common Grackle	0	1	2	3	0	1	0	0	0	0	0	0	0	0	0
Purple Finch	1	8	2	6	8	4	0	40	0	3	5	18	60	126	3
House Finch	44	64	23	74	13	65	150	317	34	39	141	54	338	1129	48
Common Redpoll	0	15	0	0	0	0	0	0	0	0	0	0	2	31	0
Pine Siskin	0	0	0	0	0	12	0	3	0	0	2	0	7	3	0
American Goldfinch	128	91	216	381	90	18	119	193	35	76	135	132	290	417	66
Evening Grosbeak	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
House Sparrow	558	502	592	1516	531	232	252	1371	58	334	1096	58	890	2509	227
Total Species	44	49	38	47	42	36	37	55	24	44	44	46	70	78	44

x = Found within 3 days of the count day but not on the day of the count.

Table 6. Number of each species in southeast Wisconsin found on 16 or more counts.

Species	Green Lake 61	Fond du Lac 62	Plymouth 63	Randolph 64	Horicon Marsh 65	Kettle Moraine 66	Columbus 67	Hartford 68	Oconomowoc 69	Waukesha 70	Fort Atkinson 71	Milton 72	Beloit 73	Lake Geneva 74	Burlington 75
Great Blue Heron	0	0	0	0	1	9	1	1	1	1	0	1	1	0	0
Canada Goose	100000	360	213	31	4792	1	0	82	3408	3676	14	2023	979	14393	526
American Black Duck	4	35	0	0	0	0	17	11	4	20	0	0	0	0	21
Mallard	86	470	19	28	30	0	475	32	776	362	58	442	1409	174	687
Common Goldeneye	14	0	0	0	0	1	0	0	3	0	0	70	89	318	7
Common Merganser	6	1	0	1	0	0	0	0	1	0	0	13	4	1470	2
Bald Eagle	6	0	0	1	1	0	0	0	5	0	0	0	0	x	0
Northern Harrier	1	1	0	0	3	0	0	0	0	0	3	0	1	1	3
Sharp-shinned Hawk	0	1	0	1	0	1	0	0	1	3	x	1	0	3	x
Cooper's Hawk	2	1	0	1	x	1	3	4	4	1	x	0	0	1	0
Red-tailed Hawk	26	32	28	31	20	24	29	26	41	34	11	27	29	26	14
Rough-legged Hawk	4	0	6	14	13	3	0	6	1	0	1	0	1	0	3
American Kestrel	4	13	11	5	11	6	6	5	18	6	1	9	3	6	5
Ring-necked Pheasant	8	0	0	2	3	15	0	13	3	1	1	2	35	13	9
Ruffed Grouse	4	2	0	0	0	2	0	0	0	0	0	0	0	0	0
Wild Turkey	146	1	76	7	1	24	0	71	36	1	10	18	3	32	1
Ring-billed Gull	3	7	30	2	6	0	0	0	14	38	0	13	2	138	1
Herring Gull	4	0	4	0	14	0	0	x	0	2	4	2	1	1555	27
Rock Dove	234	748	453	227	280	821	286	241	480	264	69	116	279	144	151
Mourning Dove	113	460	71	100	183	173	200	214	182	186	64	161	177	103	125
Eastern Screech-Owl	2	10	0	1	0	0	0	1	1	0	0	0	1	1	2
Great Horned Owl	14	16	2	0	2	x	0	2	1	8	1	2	5	1	5
Barred Owl	2	2	0	0	0	0	0	1	x	0	0	0	1	0	0
Belted Kingfisher	0	0	0	0	0	1	0	2	2	3	0	1	3	1	1
Red-headed Woodpecker	1	0	0	1	0	0	0	0	0	0	0	0	x	0	0
Red-bellied Woodpecker	17	4	11	3	2	5	2	16	8	5	16	6	15	13	8
Downy Woodpecker	54	36	37	23	25	43	9	76	38	31	35	14	60	41	17
Hairy Woodpecker	9	16	12	4	3	13	1	15	4	11	8	6	16	9	5
Northern Flicker	2	3	0	0	0	9	0	2	3	1	1	0	0	2	0
Pileated Woodpecker	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horned Lark	2	0	0	212	22	36	94	37	8	0	25	0	333	20	51
Blue Jay	105	83	50	23	29	147	19	96	54	53	15	28	66	27	32
American Crow	175	186	137	110	93	260	64	308	264	841	165	381	382	418	83
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	175	236	62	81	79	229	21	424	169	190	195	91	162	102	70
Tufted Titmouse	0	0	0	0	0	0	0	1	2	0	2	35	3	0	0
Red-breasted Nuthatch	3	0	0	0	4	13	0	3	2	5	6	8	1	4	0
White-breasted Nuthatch	41	28	11	18	8	37	6	67	41	31	6	19	29	39	19
Brown Creeper	0	2	0	0	1	3	0	1	1	4	0	1	x	1	2
Golden-crowned Kinglet	0	1	0	0	2	16	0	2	0	1	0	0	5	0	0
American Robin	28	0	0	0	0	1	0	20	3	15	0	0	0	x	0
Cedar Waxwing	75	3	0	0	0	0	0	0	0	2	0	0	0	0	0
Northern Shrike	4	2	1	0	1	0	0	3	1	0	0	1	1	0	1
European Starling	284	556	100	352	435	702	697	465	744	544	193	360	498	618	178
Northern Cardinal	59	50	47	94	12	48	16	93	87	190	63	26	111	71	52
American Tree Sparrow	203	396	66	176	843	161	405	331	184	117	91	89	1271	234	364
Song Sparrow	0	0	0	0	2	4	0	6	2	2	x	3	8	12	6
White-throated Sparrow	0	0	0	2	x	0	0	1	1	0	0	2	0	0	0
Dark-eyed Junco	308	211	171	301	158	160	198	426	184	268	104	81	628	463	283
Snow Bunting	25	150	x	4134	1	42	1000	300	x	0	0	0	400	15	400
Common Grackle	0	1	0	0	4	0	0	0	3	0	0	3	0	6	0
Purple Finch	18	0	1	0	0	0	0	0	41	0	4	15	1	17	1
House Finch	64	57	31	52	12	0	19	99	132	162	82	125	128	104	71
Common Redpoll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pine Siskin	0	0	0	0	0	29	0	0	12	0	0	0	1	0	0
American Goldfinch	81	56	99	38	54	46	22	43	59	85	40	46	37	136	41
Evening Grosbeak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
House Sparrow	108	876	329	565	731	977	606	542	366	252	166	219	1477	484	125
Total Species	51	47	28	34	42	37	24	47	53	41	36	46	45	50	45

x = Found within 3 days of the count day but not on the day of the count.

Table 7. Number of each species along Lake Michigan found on 16 or more counts.

Species	Ephraim 76	Surgeon Bay 77	Kewaunee 78	Woodland Dunes NE 79	Woodland Dunes SE 80	Riveredge 81	Milwaukee 82	Hales Corners 83	Racine 84	Kenosha 85	Number of Counts	Total Individuals	Percent Change
Great Blue Heron	x	x	0	0	2	2	2	1	0	4	23	33	+51
Canada Goose	86	2496	399	17	477	8876	1765	1356	5231	11890	48	179,149	+31
American Black Duck	0	25	0	0	17	32	53	2	15	6	34	97	-27
Mallard	44	434	0	295	300	747	2339	666	829	1388	55	27,565	+2
Common Goldeneye	42	59	195	2	70	244	1161	28	365	9	33	3,783	-26
Common Merganser	18	18	376	90	23	51	77	111	9	21	39	3,190	-12
Bald Eagle	3	0	0	0	0	2	0	0	0	0	53	425	+7
Northern Harrier	0	3	0	2	x	4	1	1	0	1	25	58	-10
Sharp-shinned Hawk	2	2	0	1	1	9	0	1	3	1	42	77	+32
Cooper's Hawk	0	0	0	0	1	9	7	0	5	0	34	105	+50
Red-tailed Hawk	0	8	12	6	10	88	23	3	22	10	69	1,800	+33
Rough-legged Hawk	0	10	8	10	0	1	0	0	1	5	58	486	+15
American Kestrel	0	1	4	6	7	20	8	3	7	6	55	393	-37
Ring-necked Pheasant	0	2	7	3	0	29	1	1	1	10	56	347	+40
Ruffed Grouse	0	9	9	4	0	4	0	0	0	0	48	292	-15
Wild Turkey	0	x	1	13	2	48	1	0	0	3	55	4,569	+208
Ring-billed Gull	237	16	0	1	17	776	562	430	105	240	29	2,733	-44
Herring Gull	18	257	560	399	271	532	1111	9	55	28	33	5,500	-54
Rock Dove	0	183	783	150	199	667	667	41	347	416	77	23,878	-1
Mourning Dove	25	137	145	135	147	650	228	127	615	63	80	13,348	+5
Eastern Screech-Owl	0	0	1	0	1	10	1	0	3	0	26	112	-36
Great Horned Owl	0	x	1	2	3	18	7	3	4	2	49	224	-32
Barred Owl	0	1	0	0	1	9	0	0	0	2	31	57	-30
Belted Kingfisher	0	0	0	0	1	3	1	0	2	1	30	62	-9
Red-headed Woodpecker	1	0	0	0	0	1	0	0	0	1	24	80	-34
Red-bellied Woodpecker	2	10	2	2	2	48	9	3	7	1	69	913	-6
Downy Woodpecker	12	47	23	27	21	248	64	29	29	2	85	3,302	+10
Hairy Woodpecker	11	44	7	10	5	68	18	7	0	1	83	1,273	-7
Northern Flicker	0	0	0	1	x	9	1	0	0	1	30	82	-27
Pileated Woodpecker	6	4	0	0	0	0	0	0	0	0	45	141	-22
Horned Lark	0	25	36	0	0	22	0	0	4	17	41	1,636	+19
Blue Jay	41	83	110	66	60	281	12	27	32	6	85	8,494	-13
American Crow	31	536	557	539	144	838	760	286	245	56	84	26,188	+25
Common Raven	5	16	0	0	0	0	0	0	0	0	27	564	-4
Black-capped Chickadee	87	317	216	163	169	1118	403	75	154	24	85	19,622	-1
Tufted Titmouse	0	0	0	0	0	0	0	0	0	1	19	198	+36
Red-breasted Nuthatch	7	29	0	10	6	8	18	0	1	0	64	945	-13
White-breasted Nuthatch	6	36	5	18	31	225	55	16	11	1	84	2,892	-24
Brown Creeper	x	3	0	1	4	13	1	2	0	2	54	213	-9
Golden-crowned Kinglet	0	x	8	3	6	4	0	1	0	0	26	124	-41
American Robin	0	x	0	0	7	31	108	2	11	3	35	226	+18
Cedar Waxwing	x	7	27	4	0	235	251	21	12	17	26	1,386	-17
Northern Shrike	3	1	7	2	1	4	1	0	2	0	55	152	-14
European Starling	25	1042	447	293	271	2496	1463	204	473	1376	80	47,437	-6
Northern Cardinal	7	104	25	86	36	446	191	78	86	8	78	6,182	+19
American Tree Sparrow	4	17	60	159	46	407	52	32	326	166	78	14,865	+17
Song Sparrow	0	0	0	1	8	25	6	2	9	3	34	285	+30
White-throated Sparrow	0	x	0	0	0	5	11	17	4	5	25	96	+20
Dark-eyed Junco	12	166	101	116	117	1297	214	97	334	145	81	19,663	+13
Snow Bunting	200	x	272	0	0	1	0	0	0	0	41	18,501	+175
Common Grackle	1	x	0	0	0	0	0	0	0	6	18	38	-85
Purple Finch	6	22	0	0	0	50	8	0	0	2	59	1,630	+17
House Finch	15	94	24	124	110	353	469	19	65	14	73	7,757	+216
Common Redpoll	0	0	0	7	0	19	0	0	0	0	17	184	-93
Pine Siskin	6	x	25	21	7	14	0	0	0	0	30	922	-77
American Goldfinch	113	327	109	200	75	428	138	40	36	49	85	8,746	-25
Evening Grosbeak	0	0	0	0	0	0	0	0	0	0	17	904	-77
House Sparrow	0	198	780	355	469	1465	841	141	352	420	75	41,851	-21
Total Species	32	46	42	46	49	77	69	42	48	63			

x = Found within 3 days of the count day but not on the day of the count.

Table 8. Species found on 15 or fewer counts.

Species	Number of counts	Number of birds	Count and number
Pied-billed Grebe	1	1	Fremont 1
American White Pelican	1	1	Lake Geneva 1
Double-crested Cormorant	7	10	Peshigo 1, Green Bay 2, Appleton 1, LaCrosse 1, Milton 1, Riveredge 1, Kenosha 3
Tundra Swan	6	18	(Luck), LaCrosse 1, Madison 10, Waukesha 1, Riveredge 2, Hales Corners 1, Kenosha 3
Trumpeter Swan	1	1	Lakewood 1
Mute Swan	10	36	Shawano 4, Montello 3, Poynette 1, Madison 5, Cooksville 1, Plymouth 1, Hartford 4, Oconomowoc 6, Ephraim 9, Woodland Dunes SE 2
Snow Goose	5	14	Appleton 1, Madison 7, Horicon Marsh 4, Milton 1, (Beloit), (Ephraim), Riveredge 1
Wood Duck	9	14	Hudson 1, Caroline 1, Fremont 1, LaCrosse 1, Wautoma 1, Madison 3, Oconomowoc 3, Burlington 1, Kenosha 2
Green-winged Teal	3	3	Caroline 1, Poynette 1, Madison 3
Northern Pintail	6	10	Green Bay 1, Appleton 1, Mount Horeb 4, Poynette 2, Sturgeon Bay 1, Hales Corners 1
Northern Shoveler	3	105	Madison 102, Fond du Lac 1, Riveredge 2
Gadwall	7	240	Appleton 5, Madison 186, Cooksville 16, Hartford 23, Oconomowoc 1, Lake Geneva 3, Milwaukee 6
American Wigeon	4	5	Poynette 2, Madison 1, Burlington 1, Riveredge 1
Canvasback	6	38	Appleton 2, LaCrosse 8, Madison 1, Milton 1, Lake Geneva 24, Racine 2
Redhead	5	30	Appleton 1, Poynette 1, Lake Geneva 4, (Ephraim), (Sturgeon Bay), Riveredge 1, Milwaukee 23
Ring-necked Duck	9	58	Fremont 1, Appleton 1, Oshkosh 1, Madison 2, Green Lake 3, Oconomowoc 41, Lake Geneva 6, Burlington 1, Milwaukee 2
Greater Scaup	5	1484	(Sturgeon Bay), Woodland Dunes SE 195, Riveredge 321, Milwaukee 951, Racine 1, Kenosha 16
Lesser Scaup	8	88	Fremont 1, Appleton 1, (Oshkosh), Madison 3, Green Lake 1, Lake Geneva 70, Woodland Dunes SE 1, Riveredge 4, Milwaukee 7
Harlequin Duck	1	1	Milwaukee 1
Oldsquaw	5	1076	Wisconsin Rapids 1, Sturgeon Bay 1000, Riveredge 37, Milwaukee 32, Racine 6
Black Scoter	1	1	Milwaukee 1
Bufflehead	15	478	Fremont 1, Appleton 11, Sauk City 3, Madison 2, Green Lake 3, Hartford 2, Lake Geneva 16, Sturgeon Bay 61, Kewaunee 30, Woodland Dunes SE 13, Riveredge 59, Milwaukee 171, Hales Corners 60, Racine 33, Kenosha 13
Hooded Merganser	10	34	Hudson 2, Green Bay 3, Appleton 8, Poynette 1, Madison 11, Lake Geneva 1, Sturgeon Bay 1, Kewaunee 1, Milwaukee 4, Kenosha 2
Red-breasted Merganser	11	262	Wisconsin Rapids 5, Appleton 2, Madison 1, Fond du Lac 1, (Sturgeon Bay), Kewaunee 30, Woodland Dunes SE 23, Riveredge 23, Milwaukee 142, Hales Corners 2, Racine 22, Kenosha 11
Ruddy Duck	6	17	Appleton 3, Oshkosh 1, Madison 1, Milton 1, Lake Geneva 4, Milwaukee 7
Northern Goshawk	14	19	(Cable), Spruce 1, Peshigo 1, (New Richmond), New Franken 1, Appleton 1, Oshkosh 1, Trempealeau 3, Richland Center 1, Sauk City 1, Mount Horeb 3, Poynette 1, Madison 1, Hartford 2, Sturgeon Bay 1, Kenosha 1
Red-shouldered Hawk	3	3	Trempealeau 1, Richland Center 1, Poynette 1
Golden Eagle	3	7	Clam Lake 1, Kickapoo Valley 3, Bridgeport 3
Merlin	4	4	LaCrosse 1, Poynette 1, Kewaunee 1, Racine 1
Peregrine Falcon	1	1	Milwaukee 1
Gray Partridge	7	65	Brussels 4, New Franken 17, (Woodland Dunes NW), Bridgeport 13, Mount Horeb 10, Fond du Lac 1, Kewaunee 13, Woodland Dunes NE 7
Greater Prairie-Chicken	3	93	Spencer 9, Arpin 6, Plainfield 78
Sharp-tailed Grouse	1	3	Holcombe 3
Northern Bobwhite	6	28	Richland Center 9, Bridgeport 4, Cooksville 2, (Green Lake), Oconomowoc 4, Burlington 3, Kenosha 6
Virginia Rail	1	3	Madison 3
American Coot	14	1008	Green Bay 1, Appleton 6, Montello 1, Madison 147, Green Lake 1, Hartford 7, Oconomowoc 11, Milton 5, Beloit 4, Lake Geneva 647, Sturgeon Bay 1, Riveredge 12, Milwaukee 154, Kenosha 11
Sandhill Crane	1	1	Green Lake 1
Killdeer	1	1	Kenosha 1
Common Snipe	11	20	Peshigo 1, New Richmond 1, Shawano 1, Kickapoo Valley 2, Richland Center 2, Bridgeport 1, Baraboo 2, Wautoma 2, Sauk City 1, Mount Horeb 1, Poynette 6
Bonaparte's Gull	1	17	Kenosha 17
Thayer's Gull	2	2	Kewaunee 1, Milwaukee 1
Glaucous Gull	4	13	(Stockbridge), Kewaunee 5, Woodland Dunes NE 3, Woodland Dunes SE 1, Milwaukee 4
Great Black-backed Gull	3	3	Woodland Dunes NE 1, Woodland Dunes SE 1, Milwaukee 1

(continued)

Table 8. Continued

Species	Number of counts	Number of birds	Count and number
Snowy Owl	13	21	Ashland 3, (Luck), Spencer 1, (Wisconsin Rapids), (Caroline), (Brussels), Green Bay 1, Appleton 1, (Oshkosh), Woodland Dunes SW 3, Poynette 1, Cooksville 1, (Horicon), Sturgeon Bay 1, Woodland Dunes NE 1, Woodland Dunes SE 3, Riveredge 1, Milwaukee 3, Racine 1
Long-eared Owl	6	8	(Stockbridge), Poynette 1, Fond du Lac 1, Waukesha 1, Woodland Dunes NE 2, Riveredge 1, (Milwaukee), Kenosha 2
Short-eared Owl	8	30	Brussels 10, Woodland Dunes SW 1, Horicon 3, Milton 1, Burlington 5, Riveredge 7, Milwaukee 1, Racine 2
Boreal Owl	1	1	Herbster 1
Northern Saw-whet Owl	3	3	Shiocton 1, Sauk City 1, Milwaukee 1
Yellow-bellied Sapsucker	9	14	Mount Horeb 1, Montello 1, Poynette 1, Madison 2, Fort Atkinson 1, Riveredge 2, Milwaukee 2, Hales Corners 1, Kenosha 3
Black-backed Woodpecker	1	3	Clam Lake 3
Gray Jay	9	61	Gurney 1, Cable 2, Clam Lake 7, Oxbow 17, Fifield 8, Manitowish Waters 4, Phelps 13, Three Lakes 3, Rhinelander 6
Boreal Chickadee	3	18	Clam Lake 16, Phelps 1, Three Lakes 1
Carolina Wren	1	1	Bridgeport 1
Winter Wren	3	3	Blanchardville 1, Madison 1, Milwaukee 1
Marsh Wren	1	1	Fond du Lac 1
Ruby-crowned Kinglet	1	1	Shiocton 1
Eastern Bluebird	2	22	(Horicon), Waukesha 2, Milwaukee 20
Hermit Thrush	3	9	Sauk City 1, Fort Atkinson 1, Milwaukee 7
Gray Catbird	1	1	Milwaukee 1
Northern Mockingbird	1	1	Baraboo 1
Brown Thrasher	1	2	(Hartford), Woodland Dunes NE 2
Bohemian Waxwing	1	1	New Richmond 1
Yellow-rumped Warbler	3	16	Kettle Moraine 4, Milwaukee 8, Hales Corners 4
Rose-breasted Grosbeak	2	2	Poynette 1, Kenosha 1
Eastern Towhee	2	2	Madison 1, Riveredge 1
Chipping Sparrow	3	3	Peshigo 1, Medford 1, Wautoma 1
Field Sparrow	1	1	Madison 1
Fox Sparrow	5	7	Rhineland 2, Trempealeau 1, Cooksville 1, Hartford 1, Riveredge 2
Swamp Sparrow	9	31	Sauk City 1, Clyde 2, Poynette 8, Madison 8, Fond du Lac 2, Riveredge 2, Milwaukee 2, Racine 3, Kenosha 3
White-crowned Sparrow	1	1	Madison 1
Lapland Longspur	11	268	Durand 1, New Franken 2, Fremont 1, Bridgeport 21, Mount Horeb 9, Poynette 122, Green Lake 65, Fond du Lac 40, Randolph 5, (Beloit), Burlington 1, Riveredge 1
Red-winged Blackbird	15	174	Herbster 1, Fremont 1, (Oshkosh), Stockbridge 1, LaCrosse 53, Bridgeport 1, Blanchardville 2, Poynette 1, Madison 16, Horicon Marsh 57, Fort Atkinson 1, Milton 33, Beloit 1, Burlington 1, (Sturgeon Bay), Riveredge 1, Kenosha 4
meadowlark spp.	3	3	Richland Center 1, Beloit 1, Riveredge 1
Yellow-headed Blackbird	2	2	Green Bay 1, Horicon 1
Rusty Blackbird	3	16	Woodland Dunes NW 1, Poynette 6, Madison 9
Brewer's Blackbird	3	17	Oconomowoc 3, Fort Atkinson 13, Kewaunee 1
Brown-headed Cowbird	12	118	Green Bay 1, Woodland Dunes SW 3, Kickapoo Valley 6, Poynette 1, Madison 4, Fond du Lac 11, Horicon Marsh 62, Fort Atkinson 2, Woodland Dunes SE 1, Riveredge 11, Racine 5, Kenosha 11
Pine Grosbeak	10	60	Herbster 3, Bayfield 1, Cable 2, Clam Lake 2, Oxbow 26, Fifield 6, Manitowish Waters 11, Gilman 2, Spencer 3, Appleton 4
Red Crossbill	9	140	(Herbster), Ashland 11, (Cable), Clam Lake 27, Oxbow 4, Manitowish Waters 20, Phelps 41, Three Lakes 2, Willard 20, Kettle Moraine 12, Milton 3
White-winged Crossbill	12	494	Bayfield 10, Clam Lake 314, Oxbow 21, Fifield 19, Manitowish Waters 2, Phelps 13, Three Lakes 52, Lakewood 1, Peshigo 3, Gilman 19, Spencer 10, Waukesha 30

Parentheses indicate species was seen within 3 days of the count but not on the count.

of general abundance within various groups of species follows.

Waterfowl—Although most lakes and rivers were frozen, Canada Geese were found in well above normal numbers, due mostly to a large concentration on

the Green Lake count. Numbers of Green-winged Teal and Northern Pintails were also above average, while the number of Redheads was the highest since 1971; the number of Ring-necked Ducks was the highest since 1974 because of an exceptionally large number

at Oconomowoc. The frozen conditions, however, adversely affected American Black Ducks, Common Goldeneyes, Common Mergansers, and American Wigeons, all of which occurred in well below normal numbers. Numbers of other ducks, geese, mergansers, swans, and coots, were quite normal. The only Pied-billed Grebe occurred at Fremont. The Black Scoter and Harlequin Duck at Milwaukee were highlights. The only Common Loon was sighted during the count period at Sturgeon Bay.

Hawks and Eagles—Cooper's, Sharpshinned, and Red-tailed hawks continued to occur in near record numbers, while numbers of American Kestrels, Northern Goshawks, and Red-shouldered Hawks were well below normal. Merlins were found on four counts, which is exceptional, and the 7 Golden Eagles was well above the 10-year average. Bald Eagles were widespread throughout the state, occurring on a record 53 counts, but the number counted was only in slightly above average.

Grouse, Pheasants, Quail, etc.—Wild Turkeys continued to expand their range, occurring on a record 55 counts this year, but the number was down slightly from last year's record. For the third year in a row, counts of Ring-necked Pheasants were well above the recent 10-year average, in spite of a lack of snow cover to enhance counts in southern Wisconsin. The number of Northern Bobwhites was the lowest since 1986, perhaps because of last year's severe winter. The number of Ruffed Grouse continued below average, and Sharp-tailed Grouse were found only on the Holcombe count.

The 93 Greater Prairie-Chickens was the second highest total ever recorded on Christmas counts.

Gulls and Other Waterbirds—With inland lakes frozen, it was a very poor year for Herring and Ring-billed gulls and other water related birds. Gulls were seen mostly on the Great Lakes. Numbers of Ring-billed and Herring gulls were 44–54% below the 10-year average. Uncommon species of gulls that were present included 17 Bonaparte's Gull at Kenosha, 13 Glaucous Gulls on 4 counts, Thayer's Gulls at Kewaunee and Milwaukee, and Great Black-backed Gulls at Woodland Dunes NE, Woodland Dunes SE, and Milwaukee. Other rarities included a Killdeer at Kenosha, and 3 Virginia Rails on the Madison count. Most surprising was the occurrence of 33 Great Blue Herons on a record 23 counts. Numbers of Belted Kingfishers and Common Snipes were slightly below the 10-year average.

Doves—Rock Doves and Mourning Doves occurred in average numbers.

Owls—Although the Boreal Owl on the Herbster count was the highlight of the 1996 Christmas count, the 21 Snowy Owls (the highest total since 1967), and the 30 Short-eared Owls were also highlights. However, numbers of Eastern Screech-Owls, Great Horned Owls, and Long-eared Owls were well below normal. Northern Saw-whet Owls were found on counts at Shiocton, Sauk City, and Milwaukee.

Woodpeckers—Numbers of Red-headed Woodpeckers, Pileated Woodpeckers, and Northern Flickers were well below the recent 10-year average,

while the number of Downy Woodpeckers was somewhat above. Yellow-bellied Sapsuckers occurred in well above normal numbers, with 14 being found on 9 counts. Three Black-backed Woodpeckers were seen on the Clam Lake count.

Jays, Crows, Chickadees, Nuthatches, etc.—In spite of last year's cold winter, the number of Tufted Titmice remained 36% above the 10-year average. The number of American Crows was also well above the 10-year average, while the number of Common Ravens remained about average. Counts of White-breasted and Red-breasted nuthatches were below normal as was the number of Blue and Gray jays. Most Red-breasted Nuthatches were found on northern counts. The 18 Boreal Chickadees (16 at Clam Lake) is the second highest total for that species.

Creepers, Kinglets, Wrens, and Warblers—Brown Creepers were less numerous than in most years and the number of Golden-crowned Kinglets was 41% below average. A Ruby-crowned Kinglet at Shiocton was a highlight. Winter Wrens were also very scarce, with only three being found. Only one Carolina Wren was found, perhaps because of last year's cold winter. The Marsh Wren at Fond du Lac was another highlight. A record 16 Yellow-rumped Warblers occurred, 4 on the Kettle Moraine count, 8 on the Milwaukee count, and 4 on the Hales Corners count.

Thrushes, Shrikes, Waxwings, etc.—It was a good year for thrushes. Robins were found throughout the state in above average numbers. The nine Hermit Thrushes was the highest number

found since 1989, and 22 Eastern Bluebirds (20 at Milwaukee) was distinctly above average. Northern Shrikes were widespread, but occurred in below normal numbers. Cedar Waxwings also were found in below normal numbers, and after last year's invasion of Bohemian Waxwings, only one appeared this year; it was on the New Richmond count. A Gray Catbird was seen at Milwaukee, a Northern Mockingbird at Baraboo, and two Brown Thrashers at Woodland Dunes NE.

Sparrows, etc.—It was an excellent year for most sparrows and related species. Numbers of Northern Cardinals, Dark-eyed Juncos, Tree Sparrows, Song Sparrows, and White-throated Sparrows were all above the 10-year average. Chipping Sparrows, which occurred for only the eleventh year, were found on a record 4 counts. The number of Swamp Sparrows was somewhat below normal, and the only Field and White-crowned sparrows were single birds on the Madison count. Eastern Towhees were found at Madison and Riveredge. A highlight was the sighting of Rose-breasted Grosbeaks at Poynette and Kenosha.

Open Country Birds—The good snow cover over the northern two-thirds of the state, which usually makes these species easy to find, helped produce a record number of Snow Buntings and above average numbers of Lapland Longspurs and Horned Larks. However, only three meadowlarks were sighted.

Blackbirds—For the fourth consecutive year, counts of blackbirds were extremely low. Numbers of Common Grackles were 85% below the recent

10-year average, and Red-winged Blackbirds were found on only 15 counts, relegating them to the table of uncommon species. The number of Rusty Blackbirds was also well below normal while numbers of Brown-headed Cowbirds and Brewer's Blackbirds were close to normal. A highlight was the sighting of Yellow-headed Blackbirds on the Green Bay and Horicon Marsh counts; this is only the eleventh year in which this species has been found on Wisconsin Christmas counts.

Finches—It was a very poor year for most winter finches. Only the Purple Finch, Red Crossbill, and White-winged Crossbill occurred in above average numbers, mostly on northern counts. Numbers of Pine Grosbeaks, Common Redpolls, Pine Siskins, and Evening Grosbeaks were all at least 75% below their 10-year average. Even the number of American Goldfinches, which occurred on all of the counts, was 25% below average. The House Finch, which was first seen in 1986 (eight on three counts), continues to spread throughout the state. This year it occurred on a record 86% of the counts with a record total of 7757.

House Sparrows and European Starlings—While the number of European Starlings was only slightly below normal, the number of House Sparrows was 21% below the 10-year average. While weather may be a factor in keeping House Sparrow numbers low, I be-

lieve that competition from House Finches is an important consideration.

Summary—The 138 species found in 1996 ranks this as the fourth best count if the number of species were the only criterion. But when you consider the low number of individuals of most species that was found on most counts this year, and the general scarcity of uncommon species on most counts, I would rank the 1996 count as somewhat disappointing. Weather on the count day probably had much to do with this impression and with results obtained on counts.

There is no charge for publication of counts in the *Passenger Pigeon*, only for those also published in *American Birds*. Submission of counts to *American Birds* (on their report form), as well as to the Wisconsin Society for Ornithology (on our latest report form, please!), is encouraged. Individuals participating in counts should submit reports and documentation to the count compiler, and not to Daryl Tessen. Compilers are responsible for reviewing and verifying documentation of unusually high numbers of rare species. If you wish to participate in a count in 1997, please contact the compiler in your area. If you plan to initiate a new count in an area not presently covered (Figure 1), please write to me to avoid conflicts and overlapping of other areas, and to obtain a report form.

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Avian Species Richness and Abundance Levels in Different Habitats Along the Bad River Corridor, Northern Wisconsin

In this paper I describe the birds observed during quantitative sampling of the Bad River Corridor. A total of 210 sites were sampled in 5 main habitats and at boundaries between some of these habitats during the 1994 and 1995 breeding seasons. Of the 80 species recorded during the point counts, 47.5% were neotropical migratory bird species, representing 68.8% of the total number of individuals observed. Differences in species richness and abundance levels were tested between edge sites and interior sites, among habitat categories (open canopy, hard edge, soft edge, and mature forest), and among all habitat and boundary types. Reasons for these differences in species richness and abundance levels may be due to vegetational and structural complexity differences among the habitats and boundaries.

by Joan E. Elias

While a number of avian ecology studies have been conducted in the western Great Lakes forests (e.g. Hoffman and Mossman 1990, Temple 1990, Hawrot et al. 1995, Hoffman 1989, Mossman et al. 1990, Van Stappen and Doolittle 1993) the Bad River Indian Reservation in northern Wisconsin constitutes an important gap in our knowledge of the breeding birds of the region.

The Bad River Indian Reservation is located in Ashland County, Wisconsin

(T.46–49 N., R.2–3 W; Figure 1a), and lies within the Lake Superior lowland avifauna zone of Wisconsin (Robbins 1991). The Bad River flows north through the reservation and into Lake Superior, forming an important corridor of wild lands in northern Wisconsin. The river corridor encompasses diverse forest types such as floodplain hardwoods, mixed conifers, and managed aspen forests within a forested landscape.

During the summers of 1994 and

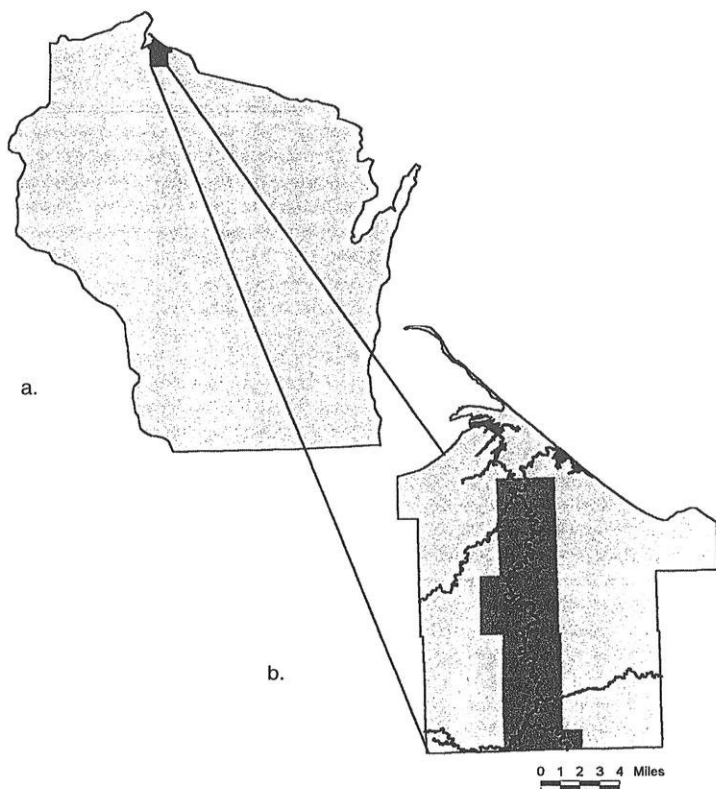


Figure 1. Location of the Bad River Indian Reservation in Wisconsin (a) and the Bad River Corridor within the Reservation (b).

1995 I conducted research on the breeding songbirds of the Bad River Corridor, an area defined by the Bad River Natural Resource Department as approximately 1 mile on either side of the river (Figure 1b). The Corridor is bounded by small gravel roads on the east and west sides. Except for US Hwy. 2 on the north and one small gravel road crossing the river, the corridor itself is roadless. However, several right-of-ways (pipelines, powerlines, railroad) do cut through the corridor.

The main objectives of this paper are, 1) to describe the avian species richness of the Bad River Corridor, and 2) to examine differences in avian spe-

cies richness and abundance levels among different habitat types. Species richness and abundance levels are compared between edge sites and interior sites, among habitat categories (open canopy, hard edge, soft edge, and mature interior), and among all habitat and edge types. The importance of the Bad River Corridor to neotropical migratory birds in general and to bird species of regional management concern is discussed.

METHODS

Bird Sampling—Research areas representing the 5 most common forest

types in the Bad River Corridor were chosen using aerial photographs and land cover maps constructed and ground-truthed by the Bad River Band of Lake Superior Chippewa. Breeding bird censuses were conducted within these 5 main forest types and on the boundaries, or edge habitats, between some of the forest types, for a total of 13 sampling categories (Table 1). Sites were stratified by habitat type and chosen randomly (though constrained by logistics; i.e. sites were rejected if access was not feasible). Sites within each habitat type were approximately equally distributed across time of morning and time of season and were located at least 250 meters apart to minimize double-counting of individuals. Interior habitats were sampled at least 100 meters from an edge with a differing habitat type or road. Boundaries between habitat type were located on aerial photos and boundary points were sampled on the edge between the 2 habitats.

Ten-minute, unlimited distance point counts were used to census birds

during the peak of the breeding season (June 1–July 10). All birds seen and heard were recorded along with their approximate positions relative to point center. Codes were used to indicate whether a bird was calling, singing, visually observed, or flying over. Flyovers above canopy level were indicated on the data forms but not included in the analyses.

Sampling was conducted during the early morning hours from 1/2 hour before sunrise until 10:00 A.M., and not conducted when windspeed exceeded 15 mph or when there was a steady rain (light or intermittent rain was tolerable since it didn't interfere with auditory surveying of birds). These are standard procedures for the census of breeding birds (Ralph et al. 1993, Blake et al. 1991, Smith et al. 1993).

The majority of the sampling (203 points) was conducted by myself. A second observer (M. Robertsen) sampled 7 points spread among 3 habitat types.

Habitat Descriptions—MAIN HABITATS—The 5 most common cover

Table 1. Habitats and boundary types sampled via point counts in 1994 and 1995 in the Bad River Corridor, Wisconsin, and the number of points in each habitat.

	1994 # points	1995 # points	TOTAL # points
Main Habitats			
Aspen Clearcut	12	16	28
Aspen-Red Maple	13	9	22
Boreal Hardwood-Conifer	12	7	19
Bottomland Hardwoods	13	2	15
Black Ash	12	8	20
Boundary Types			
Aspen Clearcut/Aspen-Red Maple	10	15	25
Aspen Clearcut/Boreal Hardwood-Conifer	12	8	20
Aspen-Red Maple/Black Ash	8	7	15
Boreal Hardwood-Conifer/Black Ash	8	8	16
Bottomland Hardwoods/Black Ash	7	5	12
Bottomland Hardwoods/Boreal Hardwood-Conifer	7	1	8
Aspen-Red Maple/Bottomland Hardwoods	0	1	1
Aspen-Red Maple/Boreal Hardwood-Conifer	9	0	9
Total # Points	123	87	210

types within the Bad River Corridor are: 1) aspen clearcut, 2) aspen-red maple, 3) boreal hardwood-conifer, 4) bottomland hardwoods, and 5) black ash (Table 1). The cover-type classification system used by the Bad River Band (Westad et al. 1993) is based on the Minnesota Department of Natural Resources Natural Heritage Program's native vegetation community types (Minn. DNR 1993). The 5 main habitat types chosen for this study are described in detail below, and common plant species within each are listed in Table 2.

1) *Aspen Clearcut (ACC)*. Twelve percent of the corridor is in recently harvested aspen (see Appendix 1 for Latin names of plants). On well-drained soils these areas are usually thick with regenerating aspens under 4 meters in height, and may also include hazelnut and dogwood species. On wet soils often the aspen is not regenerating well and is interspersed with alder thickets. Many clearcuts contain residual red maples and/or red and white pines, either as scattered individuals or in small clumps. The ground flora is extremely diverse and on drier sites is typical of a northern dry-mesic forest (sensu Curtis, 1959).

2) *Aspen-Red Maple (ARM)*. Trembling aspen and red maple dominate the canopy of this cover type with some stands containing big-tooth aspen instead of trembling aspen. Minor canopy components include white birch, black ash, and red and white pines, though the conifer element is usually small. The canopy cover is not dense, usually estimated at less than 40%. The subcanopy consists of mainly red maple and has an average estimated cover of between 40% and 70%. The understory, or shrub layer (3–12 feet in

height) is usually dense (greater than 70% cover with hazelnut and *Viburnum* spp. on the drier sites and alder on wet soils. The ground flora is similar to that of the aspen clearcut community type. Aspen-red maple was combined with the Bad River's aspen cover type (where red maple is not a strong canopy species) in this study. Together, these cover types comprise approximately 38% of the Bad River Corridor acreage.

2) *Boreal Hardwood-Conifer (BOR)*. This cover type is a later successional stage of the ARM habitat and covers 17% of the Corridor. The canopy layer consists of trembling aspen and occasionally big-tooth aspen, red maple, white birch, balsam fir, white spruce, and red and white pines. Often the pines are found as a super-canopy. The canopy cover is generally greater than in ARM (estimated to be on average between 40% and 70%). The subcanopy cover has a percent cover similar to the ARM cover type but contains a greater percentage of conifer species. The BOR understory is less dense than that of the ARM habitat and often contains a strong conifer component (balsam fir) as well as hazelnut, alder, Juneberry, and buffalo-berry near the river bluffs. The herb layer is diverse, with a more boreal species composition than the ARM community. The BOR cover type has a stronger conifer component in all forest layers than the ARM cover type, and occasionally the presence of a coniferous super-canopy.

4) *Bottomland Hardwoods (BOT)*. This is a lowland community type found along the inside bends of the Bad River where annual spring flooding has enriched the soils. It comprises 9% of the corridor. The canopy cover is relatively dense and consists of sugar maple, sil-

Table 2. Common vegetation in the 5 main habitat types within the Bad River Corridor, Wisconsin. Latin names in Appendix 1. Percentages indicate the percent of the total acreage in the corridor covered by each habitat type.

Type	Super canopy	Canopy*	Understory (shrub layer)	Ground cover
Aspen Clearcut (ACC) 12%		Residuals: Red Pine White Pine Red Maple	Trembling Aspen Red Maple Speckled Alder Hazelnut species	Bracken Fern Barren Strawberry Big-leaved Aster Canada Mayflower Wild Pea Rice Grass
Aspen-Red Maple (ARM) 38%		Trembling Aspen Red maple (White Birch) (White Pine) (Black Ash)	Speckled Alder Hazelnut species Nannyberry Downy Arrow-wood	<i>similar to aspen clearcut</i>
Boreal Hardwood-Conifer (BOR) 17%	Red Pine White Pine	Trembling Aspen Red Maple White Birch Balsam Fir White Spruce Red Pine White Pine	Juneberry Buffalo-berry Hazelnut species Speckled Alder	<i>some areas are similar to aspen clearcut</i> <i>other areas:</i> Sarsaparilla Pennsylvania Sedge Horse Gentian Bluebead Lily Starflower
Bottomland Hardwoods (BOT) 9%		Sugar Maple Silver Maple Basswood Box Elder Yellow Birch Black Ash (White Spruce) (Hemlock) (White Cedar)	Alternate-leaved Dogwood Nannyberry Downy Arrow-wood American Elm	Ostrich Fern Horsetail Wood Nettle <i>Rich Spring Ephemeral</i> <i>Community including:</i> Wild Leek Wild Ginger False Rue Anemone Trillium
Black Ash (BA) 7%		Black Ash Red Maple Silver Maple White Cedar Basswood (American Elm) (White Spruce) (Balsam Fir)	Downy Arrow-wood Dogwood species Speckled Alder	Marsh Marigold Marsh Saxifrage Sensitive Fern Meadow Rue Loosestrife Sedges

* Species in parentheses are minor canopy species.

ver maple, basswood, box elder, and yellow birch, with fewer numbers of white spruce, hemlock, and white cedar. The BOT cover type has an old-growth component, with some trees reaching diameters of approximately 4 feet. Snags and downed logs are com-

mon. The understory is more sparse than any of the other 4 main cover types and is limited to areas where there is a gap in the canopy. Common understory species include alternate-leaf dogwood and *Viburnum* spp. The ground layer consists of a rich spring

ephemeral community early in the season, with wood nettle and ostrich fern reaching chin-height by mid-June.

5) *Black Ash (BA)*. The canopy of this cover type consists predominantly of black ash, with some red maple, and silver maple, and smaller numbers of basswood, balsam fir, white spruce, and white cedar. Generally, the canopy cover is sparse, with the average estimate slightly greater than 40% cover. Often there is no subcanopy layer. The understory layer is patchy, with dense alder thickets, *Viburnum* spp. and dogwood species in some places, while in other areas it is more open with robust sedges as a ground cover. Many black ash swamps are or had been flooded by beavers and contain many standing dead trees. The ground flora is diverse and is dominated by wetland species. For this study the black ash cover type was combined with Bad River's mixed hardwood lowland forest, which has a stronger red-maple component in the canopy, but otherwise is very similar to black ash. Together these community types cover approximately 7% of the corridor.

The ACC, ARM, and BOR communities represent different successional stages of the same basic forest type, all upland above the river bottoms. Aspen clearcut has been managed recently, within the past 10 years. Aspen-red maple forests were harvested between 25 and 50 years ago. Boreal hardwood-conifer forests have not been managed within the past approximately 60 to 80 years.

The BOT and BA communities also have not been managed in the last approximately 60 to 80 years. Some patches in these forest types appear to be old growth, i.e. they have not experienced significant management

post-European settlement. In some places American elm was salvaged from the BOT habitat during the time the Dutch elm disease swept through the area (late 1960s to early 1970s). Both the BOT and BA forest types occur in lowland areas; BOT along the Bad River, and BA stands either in close proximity to BOT forests or along tributaries of the Bad River.

Habitat Descriptions—EDGE TYPES—Edges between habitats can be categorized as either "hard" or "soft." In this study, hard edges occur between aspen clearcuts (ACC) and mature upland forests (ARM and BOR); soft edges occur between upland mature forest (ARM and BOR) and lowland mature forest (BOT and BA). At hard edges a clear break in the canopy exists, while the understory (shrub layer) is continuous and dense. While soft edges may be abrupt in topography, there is little or no break in the canopy layer and relatively minor structural differences between the 2 habitat types comprising soft edges. Definitions of the terms "hard" and "soft" edges may differ among disciplines, but I am comfortable with their use in this study as defined above, based on the precedence in bird studies of using habitat structural characteristics to identify edge types (Ratti and Reese 1988, Hunter 1990, Rudnicki and Hunter 1993, Fenske 1995, Howe et al. 1996).

Bird Data Management—In order to determine whether data collected in the 2 field seasons could be pooled, 1994 and 1995 bird species abundance data were compared using Spearman rank correlations and multi-response permutation procedures (Biondini et

al. 1985, Zimmerman et al. 1985). Results of these tests (reported in Elias 1996) indicate that within each habitat and boundary type similar species were found at similar abundance levels in 1994 and 1995, allowing the data from the 2 field seasons to be pooled in further analyses.

RESULTS

During the 2 field seasons (1994 and 1995) a total of 210 sites were sampled; 123 sites in 1994 and 87 sites in 1995 (Table 1). A total of 80 species and 3147 individuals were encountered during the point counts (Table 3). Of the 80 species 38 (47.5%) are neotropical migrants (according to Peterjohn and Sauer 1993, Sauer and Droege 1992, Terborgh 1989, Whitcomb et al. 1981, or Freemark and Collins 1992). These 38 species comprise 68.8% of the total number of individuals observed. An additional 25 species (31.2% of the total species), comprising 24.7% of the total individuals encountered, are short-distance migrants. The remaining 17 species are permanent residents (11 species) or unclassified (6 species).

The 10 most common species observed were (in decreasing order of abundance): Ovenbird, Red-eyed Vireo, Nashville Warbler, White-throated Sparrow, Veery, Chestnut-sided Warbler, Common Yellowthroat, Black-throated Green Warbler, American Redstart, and Great-crested Flycatcher. With the exception of the White-throated Sparrow, all of these most abundant species are neotropical migrants. These 10 species accounted for 52.8% of the total number of individuals recorded. By contrast, the 30 least abundant species accounted for

Table 3. Total number of individuals of all species observed during point counts in 1994 and 1995 in the Bad River Corridor, Wisconsin

Species	# Individuals
Ovenbird	370
Red-eyed Vireo	230
Nashville Warbler	176
White-throated Sparrow	152
Veery	151
Chestnut-sided Warbler	145
Common Yellowthroat	129
Black-throated Green Warbler	106
American Redstart	105
Great-crested Flycatcher	98
Song Sparrow	92
Mourning Warbler	91
Rose-breasted Grosbeak	89
Swamp Sparrow	75
Hermit Thrush	62
Blue Jay	61
Black-and-white Warbler	60
Least Flycatcher	60
Golden-winged Warbler	57
American Robin	55
Yellow-bellied Sapsucker	54
Cedar Waxwing	59
Blackburnian Warbler	47
Alder Flycatcher	46
Winter Wren	43
Brown Creeper	37
White-breasted Nuthatch	35
Northern Flicker	35
Brown-headed Cowbird	34
Canada Warbler	34
Northern Parula	29
Eastern Wood-Pewee	25
Red-winged Blackbird	25
American Goldfinch	23
Black-capped Chickadee	22
Northern Waterthrush	19
Hairy Woodpecker	17
Red-breasted Nuthatch	17
Common Raven	13
Wood Thrush	13
Pine Warbler	11
Ruffed Grouse	11
Solitary Vireo	10
Yellow-throated Vireo	10
Gray Catbird	8
Yellow-bellied Flycatcher	8
Downy Woodpecker	7
Purple Finch	7
Scarlet Tanager	7
Sedge Wren	7
Northern Oriole	6
Ruby-throated Hummingbird	6

(continued)

Table 3. Continued

Species	# Individuals
Yellow Warbler	6
House Wren	5
Yellow-rumped Warbler	5
Pileated Woodpecker	5
American Crow	4
Tree Swallow	4
Broad-winged Hawk	3
Chipping Sparrow	3
Indigo Bunting	3
Magnolia Warbler	3
Bald Eagle	2
Barred Owl	2
Common Snipe	2
Eastern Kingbird	2
Great Blue Heron	2
American Woodcock	2
Wood Duck	2
Black-billed Cuckoo	1
Belted Kingfisher	1
Eastern Phoebe	1
Evening Grosbeak	1
Killdeer	1
Mallard	1
Mourning Dove	1
Olive-sided Flycatcher	1
Red-tailed Hawk	1
Rusty Blackbird	1
Virginia Rail	1
Total # individuals	3147

only 2.5% of the total number of individuals.

Figure 2 shows the relative abundance levels of all species in the 5 main habitats. Appendix 3 lists species and their abundance levels for each habitat and boundary type.

All data in this section have been square root transformed in order to better approximate a normal distribution. This transformation is appropriate for data with Poisson distributions, as is the case with count data. In the analysis of variance (ANOVA) among specific habitats and boundaries 0.375 was added to the count data before taking the square root in order to accommodate the large number of zero

counts. A significance level of $p < 0.05$ is used in the statistical comparisons below.

Edge Sites vs. Interior Sites—T-tests are used to test for differences in the number of individuals/point and the number of species/point between 8 boundary types (edge sites) and the 5 main habitats (interior sites). Interior points include those in the following habitats: aspen clearcut (ACC), aspen-red maple (ARM), boreal hardwood-conifer (BOR), bottomland hardwoods (BOT), and black ash (BA). Aspen clearcut is included as an interior habitat in this case because the object is to look at edge effects, not open vs. closed canopy effects. Edge points include those at the following boundaries: aspen clearcut/aspen-red maple (CCARM), aspen clearcut/boreal hardwood-conifer (CCBOR), aspen-red maple/black ash (ARMB), boreal hardwood-conifer/black ash (BORBA), bottomland hardwoods/black ash (BOTBA), bottomland hardwoods/boreal hardwood-conifer (BOTBOR), aspen-red maple/boreal hardwood-conifer (ARMBOR), and aspen-red maple/bottomland hardwoods (ARMBOT).

Results of the t-tests show that edge sites contain more individuals/point than do interior sites (15.5 and 14.5, respectively) but these differences are not significant ($p = 0.056$; Figure 3a). Significant differences do exist in the number of species/point, however, with boundary sites having a greater number than interior sites (12.0 and 10.5, respectively, $p = 0.001$; Figure 3b).

Habitat Categories—To test for differences in the number of individuals/

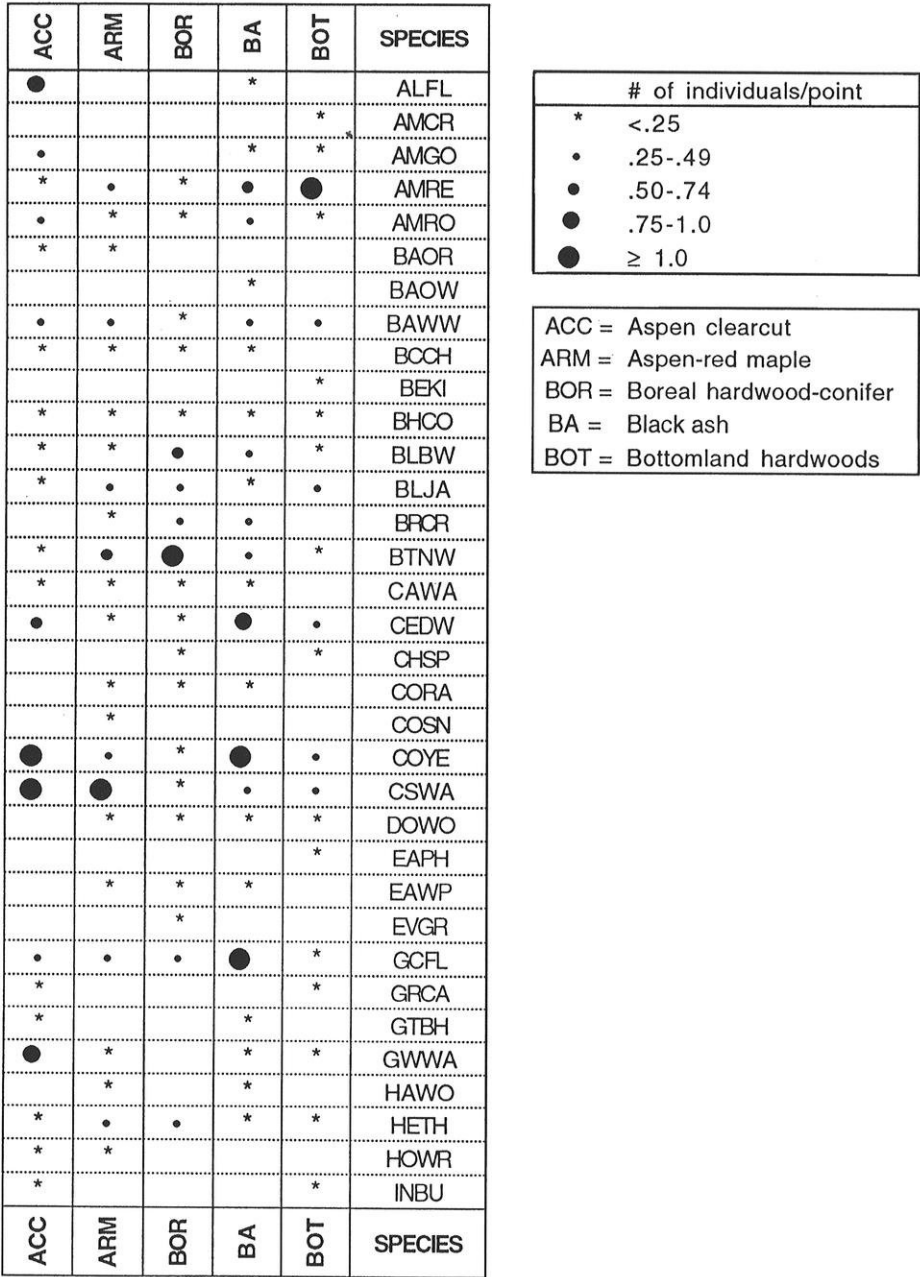


Figure 2. Relative abundance levels for all bird species encountered in the five main habitats (excluding edge habitats) in the Bad River Corridor, Wisconsin. See text for habitat codes. Bird species codes listed in Appendix 2.

(continued)

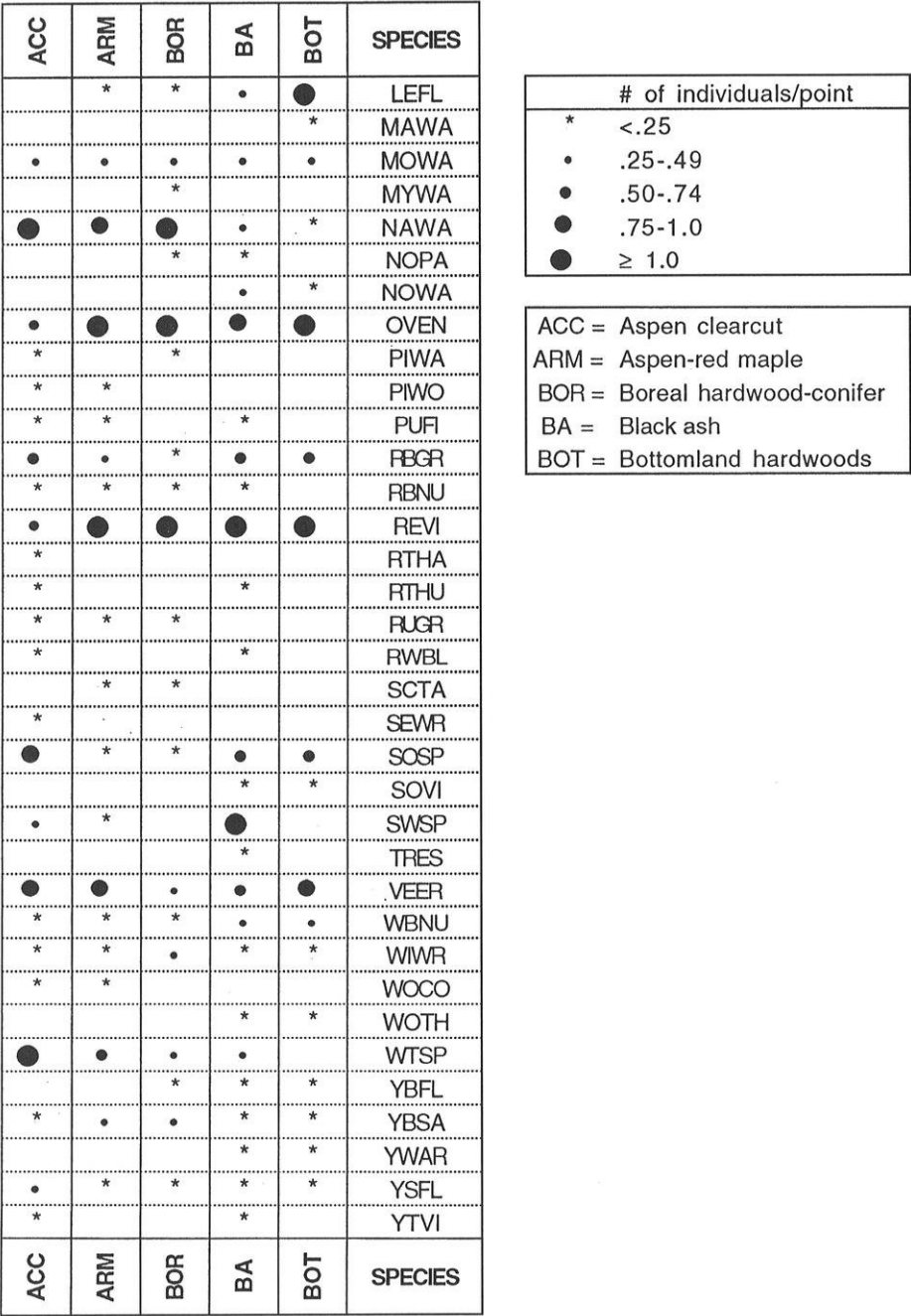


Figure 2. Continued

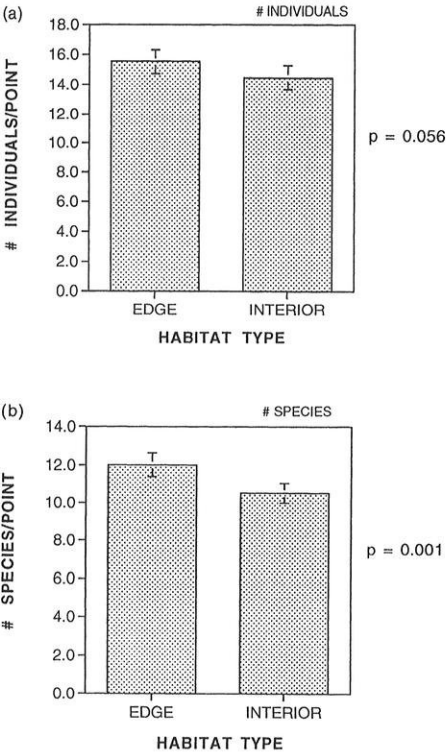


Figure 3. T-test results of the number of individuals per point (a) and number of species per point (b) at edge sites vs. interior sites in the Bad River Corridor, Wisconsin. Error bars indicate two standard errors.

point and the number of species/point among habitat categories, a one-way analysis of variance (ANOVA) is used. The habitat categories tested are open canopy (ACC), hard edge (CCARM, CCBOR), soft edge (ARMB, BORBA, BOTBA, BOTBOR, ARMBOR, and ARMBOT), and mature interior (ARM, BOR, BOT, BA).

Significant differences exist among these habitat categories in the number of individuals/point ($p = 0.007$; Figure 4a) and the number of species/point ($p = 0.000$; Figure 4b). Mature interior points contain significantly fewer numbers of individuals (13.8)

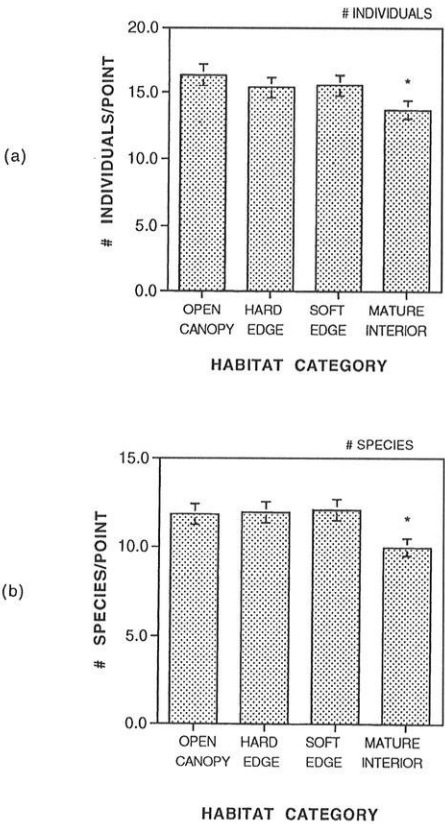


Figure 4. Analysis of variance results comparing the number of individuals/point (a) and number of species/point (b) among habitat categories in the Bad River Corridor, Wisconsin. See text for details about habitat categories. Error bars indicate two standard errors. * indicates significance at $p < 0.005$.

and species (10.0) per point than any of the other habitat categories.

Specific Habitats and Boundaries—A one-way ANOVA is also used to test for differences in the number of individuals/point and number of species/point among the 10 habitat and boundary types with sufficiently high sample sizes (ACC, ARM, BOR, BOT, BA, CCARM, CCBOR, ARMB, BORBA, BOTBA). Significant differ-

ences exist among the habitats and boundaries for both numbers of individuals and numbers of species per point ($p = 0.000$ in both cases; Figures 5a and 5b, respectively). A similar pattern exists for both the numbers of species/point and the numbers of individuals/point among habitats. The 4 hab-

itats with fewest numbers of individuals/point (BOR, BOT, ARM, and CCBOR) also have the fewest numbers of species/point. The 3 habitats with the highest numbers of individuals/point (BORBA, ARMBA, CCARM) also have the highest numbers of species/point.

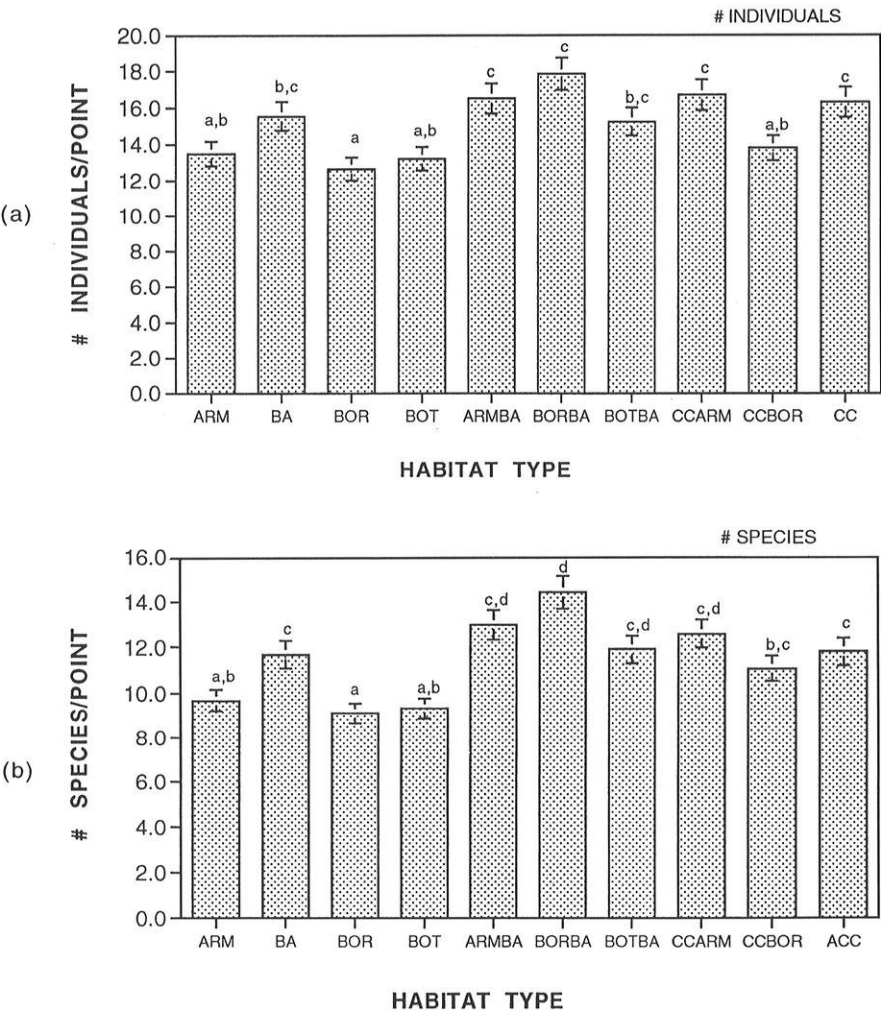


Figure 5. Analysis of variance results comparing the number of individuals/point (a) and number of species/point (b) among habitats and boundary types in the Bad River Corridor, Wisconsin. Error bars indicate two standard errors. Letters above bars indicate significant differences at $p < 0.05$ level. See text for habitat abbreviations.

DISCUSSION

Migratory bird species accounted for the vast majority of individuals observed (93.5%) during the point count samples. Permanent residents, accounting for approximately 6% of the total number of individuals observed during sampling, may be under-represented due to the sampling method used. Point counts, primarily an auditory census technique, were conducted in June and early July when many permanent residents, such as woodpeckers, Black-capped Chickadee, Red- and White-breasted Nuthatches are no longer breeding. Under-representation of permanent residents, however, does not undermine the importance of the Bad River Corridor as breeding grounds for migratory species, especially neotropical migrants.

A large proportion (52.8%) of the total number of individuals was composed of only 10 species, a typical finding for studies of species assemblages (Preston 1962). Of these 10 most abundant species observed in the Bad River Corridor, several are listed as among the most abundant in other regional studies as well. Ovenbird and Red-eyed Vireo ranked first and second in abundance, respectively, in the Bad River Corridor. These species had the same rankings in the Apostle Island National Lakeshore in 1995 (Van Stappen and Dallman 1995) and in the Chequamegon National Forest in 1992 and 1993 (Hawrot et al. 1993), and they ranked among the most abundant in the forested areas of the Sandstone Unit of the Rice Lake National Wildlife Refuge in Minnesota (Hanowski and Niemi 1993). These 2 species alone accounted for over 19% of the total in-

dividuals observed during the Bad River Corridor point counts.

Thirteen species of neotropical migrants observed during the point counts are known to be experiencing population declines in the Midwest (Thompson et al. 1993; Table 4a). Six of these 13 species (Chestnut-sided Warbler, Nashville Warbler, Veery, Great-crested Flycatcher, American Redstart, and Common Yellow-throat)

Table 4. Neotropical migratory bird species encountered during the study in the Bad River Corridor, Wisconsin, showing population declines in the Midwest (a), and those identified as being of management concern in the Midwest (b).

a. Bird species showing population declines in the Midwest

Golden-winged Warbler
Wood Thrush
Chestnut-sided Warbler
Nashville Warbler
Canada Warbler
Eastern Wood-Pewee
Veery
Great-crested Flycatcher
Olive-sided Flycatcher
Rose-breasted Grosbeak
American Redstart
Indigo Bunting
Common Yellow-throat

b. Species of management concern in the Midwest

Golden-winged Warbler
Wood Thrush
Chestnut-sided Warbler
Nashville Warbler
Canada Warbler
Eastern Wood-Pewee
Veery
Mourning Warbler
Great-crested Flycatcher
Olive-sided Flycatcher
Ovenbird
Blackburnian Warbler
Black-billed Cuckoo
Rose-breasted Grosbeak
Scarlet Tanager
Yellow-throated Vireo
Magnolia Warbler
Yellow-bellied Flycatcher
Black-throated Green Warbler

are among the 10 most abundant species in the Bad River Corridor. Nineteen species observed during this study have been identified as neotropical migratory bird species of management concern in the Midwest (Thompson et al. 1993; Table 4b). Again, 6 of these species (Chestnut-sided Warbler, Nashville Warbler, Veery, Great-crested Flycatcher, Ovenbird, and Black-throated Green Warbler) are among the 10 most common species in the Bad River Corridor.

The fact that some declining species and some species of management concern are found abundantly in the Bad River Corridor suggests that this area may be a source habitat (Pulliam 1988, Howe et al. 1991) for these species. The importance of the Bad River Corridor in particular, and the entire western Great Lakes Region in general, as a source habitat for species listed in Tables 4a and 4b is yet to be proven. Detailed studies on nesting success, productivity, and survivorship are needed to determine whether the Bad River Corridor contains source or sink habitats.

The Brown-headed Cowbird, a nest parasite known to affect the nesting success of a variety of species (Mayfield 1964, Brittingham and Temple 1983, Robinson 1992), was observed in every habitat and boundary type in the Bad River Corridor. This species ranked 29th in abundance out of 80 species, averaging 0.16 individuals/point, which is similar to abundance levels in the Chequamegon National Forest (0.13 individuals/point, Hawrot et al. 1993). Cowbirds were found most abundantly at the boundary between boreal hardwood-conifer (BOR) and black ash (BA) forest types (0.5 individuals/point). The high number of this

species at this boundary type are inexplicable since cowbirds were not found in high numbers in either BOR or BA habitats (0.11 and 0.05 individuals/point, respectively). While cowbirds did not occur in high numbers in general, the effect of this species remains unknown in the absence of research on nesting success of host species.

Edge Sites vs. Interior Sites—Wildlife managers have recognized for years that maximizing edge will maximize local species diversity (Leopold, 1933; Odum, 1971). The Bad River Corridor provides no exception to this rule, showing higher numbers of species/point at edge sites compared to interior sites. Vegetation structure is complex at the junction of 2 habitat types, a feature known to increase bird species richness (Niemi and Hanowski 1984, Probst et al. 1992). Species representing 2 different habitats may be found together at the edge between these 2 habitats, resulting in species richness greater than that which is found in either habitat alone.

Differences Among Habitats—The lower numbers of individuals/point and the lower numbers of species/point in mature interior habitat types in comparison to hard edges, soft edges, and open canopy sites may be related to vegetation and structural complexity. Hard edges, which occur where a mature forest meets an open canopy habitat (in this case ARM and BOR adjacent to ACC), have a high degree of vegetation contrast, offering a wide variety of possible nesting and feeding areas. While soft edges are not as abrupt as hard edges, changes in the percent cover of the different forest layers (canopy, subcanopy, unders-

tory) usually occur at these boundaries. Aspen clearcuts are deceptively complex structurally and/or vegetationally in the Bad River Corridor. The presence of residual trees provides nesting sites for some species. For example I observed Pine Warblers in small patches of residual pines within aspen clearcuts. The ACC habitat has a dense understory layer consisting not only of regenerating aspen but also stump-sprouting red maples, a variety of shrub species, and patches of alders or openings of robust sedges in wet pockets. The presence of snags in the ACC habitat provides feeding and nesting sites for species such as woodpeckers and nuthatches. In comparison with edge and aspen clearcuts, the degree of structural and vegetation complexity in mature interior habitat types is usually less. The canopy cover is relatively continuous, and while the understory layer may range from nearly absent (as in BOT) to early continuous (as in ARM), the degree of contrast in these mature forests is less than that of edge or open canopy habitats.

Bird species diversity within a particular habitat type (alpha diversity, Whittaker 1972) is of limited value in itself. One must look at the species diversity of the entire landscape (gamma diversity, Whittaker 1972) in order to determine the importance of a particular habitat type. For example, species which prefer boreal hardwood-conifer habitats, but which avoid clearcuts, will be absent from the landscape if no BOR habitats exist, decreasing diversity at the landscape scale. The fact that boreal hardwood-conifer and bottomland hardwood habitats contained relatively few numbers of species in this study does not diminish the importance of

these habitat types on a landscape scale, as they add to gamma diversity.

CONCLUSION

A total of 80 species of birds were observed at the 210 sampling points in the Bad River Corridor during 1994 and 1995. Twenty-two of these species are neotropical migrants that have shown population declines in the Midwest and/or are of management concern in this region; 8 of these 22 species are among the 10 most abundant species observed during this study. The Bad River Corridor may be a source habitat for these species and others, but further research on productivity is required in order to establish this.

Boundary sites contained a greater number of species/point than interior points. Mature interior points had fewer species/point and fewer individuals/point than hard edges, soft edges, and clearcut points. These results are not surprising and probably reflect differences in structural complexity among habitat types.

The Bad River Corridor is a complex mosaic of habitat types which enhances bird species richness at the landscape level.

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Appendix 1. Common and Latin names of plants mentioned in text (according to Gleason, H.A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, Second Edition. New York Botanical Garden).

Common name	Genus	Species
Alternate-leaf Dogwood	<i>Cornus</i>	<i>alternifolia</i>
American Elm	<i>Ulmus</i>	<i>americana</i>
Balsam Fir	<i>Abies</i>	<i>balsamea</i>
Barren Strawberry	<i>Waldsteinia</i>	<i>fragarioides</i>
Basswood	<i>Tilia</i>	<i>americana</i>
Big-leaved Aster	<i>Aster</i>	<i>macrophyllus</i>
Big-tooth Aspen	<i>Populus</i>	<i>grandidentata</i>
Black Ash	<i>Fraxinus</i>	<i>nigra</i>
Bluebead Lily	<i>Clintonia</i>	<i>borealis</i>
Box Elder	<i>Acer</i>	<i>negundo</i>
Bracken Fern	<i>Pteridium</i>	<i>aquilinum</i>
Buffalo-berry	<i>Shepherdia</i>	<i>canadensis</i>
Canada Mayflower	<i>Maianthemum</i>	<i>canadense</i>
Dogwood species	<i>Cornus</i>	species
Downy Arrow-wood	<i>Viburnum</i>	<i>rafinesquianum</i>
False Rue Anemone	<i>Isopyrum</i>	<i>bifloratum</i>
Hazelnut species	<i>Corbyus</i>	species

(continued)

Appendix 1. Continued

Common name	Genus	Species
Hemlock	<i>Tsuga</i>	<i>canadensis</i>
Horse Gentian	<i>Triosteum</i>	<i>perfoliatum</i>
Horsetail	<i>Equisetum</i>	<i>species</i>
Juneberry	<i>Amelanchier</i>	<i>species</i>
Loosestrife	<i>Lysimachia</i>	<i>species</i>
Marsh Marigold	<i>Caltha</i>	<i>palustris</i>
Meadow Rue	<i>Thalictrum</i>	<i>dasycarpum</i>
Nannyberry	<i>Viburnum</i>	<i>lentago</i>
Ostrich Fern	<i>Matteuccia</i>	<i>struthiopteris</i>
Pennsylvania Sedge	<i>Carex</i>	<i>pennsylvanica</i>
Red Maple	<i>Acer</i>	<i>rubrum</i>
Red Pine	<i>Pinus</i>	<i>resinosa</i>
Rice Grass	<i>Oryzopsis</i>	<i>species</i>
Sarsaparilla	<i>Aralia</i>	<i>nudicaulis</i>
Sedges	<i>Carex</i>	<i>species</i>
Sensitive Fern	<i>Onoclea</i>	<i>sensibilis</i>
Silver Maple	<i>Acer</i>	<i>saccharinum</i>
Speckled Alder	<i>Alnus</i>	<i>incana</i>
Starflower	<i>Trientalis</i>	<i>borealis</i>
Sugar Maple	<i>Acer</i>	<i>saccharum</i>
Swamp Saxifrage	<i>Saxifraga</i>	<i>pennsylvanica</i>
Trembling Aspen	<i>Populus</i>	<i>tremuloides</i>
Trillium	<i>Trillium</i>	<i>grandiflorum</i>
White Birch	<i>Betula</i>	<i>papyrifera</i>
White Cedar	<i>Thuja</i>	<i>occidentalis</i>
White Pine	<i>Pinus</i>	<i>strobus</i>
White Spruce	<i>Picea</i>	<i>glauca</i>
Wild Ginger	<i>Asarum</i>	<i>canadense</i>
Wild Leek	<i>Allium</i>	<i>triccoccum</i>
Wild Pea	<i>Lathyrus</i>	<i>ochroleucus</i>
Wood Nettle	<i>Laportea</i>	<i>canadensis</i>
Yellow Birch	<i>Betula</i>	<i>lutea</i>

Appendix 2. Common names, Latin names, and species codes for all bird species mentioned in text (according to the American Ornithologist's Union. 1983. Check-list of North American Birds. 6th Edition. American Ornithologist's Union).

Common name	Latin name	AOU code
Alder Flycatcher	<i>Empidonax alnorum</i>	ALFL
American Bittern	<i>Botaurus lentiginosus</i>	AMBI
American Black Duck	<i>Anas rubripes</i>	BLDU
American Crow	<i>Corvus brachyrhynchos</i>	AMCR
American Goldfinch	<i>Carduelis tristis</i>	AMGO
American Redstart	<i>Setophaga ruticilla</i>	AMRE
American Robin	<i>Turdus migratorius</i>	AMRO
American Woodcock	<i>Scolopax minor</i>	AMWO
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BAEA
Bank Swallow	<i>Riparia riparia</i>	BANS
Barn Swallow	<i>Hirundo rustica</i>	BASW
Barred Owl	<i>Strix varia</i>	BAOW
Belted Kingfisher	<i>Ceryle alcyon</i>	BEKI
Black-and-white Warbler	<i>Mniotilta varia</i>	BAWW
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	BBCU
Black-capped Chickadee	<i>Parus atricapillus</i>	BCCH
Black-throated Green Warbler	<i>Dendroica virens</i>	BTNW
Blackburnian Warbler	<i>Dendroica fusca</i>	BLBW
Blue Jay	<i>Cyanocitta cristata</i>	BLJA
Blue-winged Teal	<i>Anas discors</i>	BWTE
Broad-winged Hawk	<i>Buteo platypterus</i>	BWHA
Brown Creeper	<i>Certhia americana</i>	BRCR
Brown-headed Cowbird	<i>Molothrus ater</i>	BHCO
Canada Goose	<i>Branta canadensis</i>	CAGO
Canada Warbler	<i>Wilsonia canadensis</i>	CAWA
Cedar Waxwing	<i>Bombicilla cedrorum</i>	CEDW
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	CSWA
Chimney Swift	<i>Chaetura pelagica</i>	CHSW
Chipping Sparrow	<i>Spizella passerina</i>	CHSP
Cliff Swallow	<i>Hirundo pyrrhonota</i>	CLSW
Common Grackle	<i>Quiscalus quiscula</i>	COGR
Common Loon	<i>Gavia immer</i>	COLO
Common Merganser	<i>Mergus merganser</i>	COME
Common Raven	<i>Corvus corax</i>	CORA
Common Snipe	<i>Gallinago gallinago</i>	COSN
Common Yellowthroat	<i>Geothlypis trichas</i>	COYE
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	DCCO
Downy Woodpecker	<i>Picoides pubescens</i>	DOWO
Eastern Kingbird	<i>Tyrannus tyrannus</i>	EAKI
Eastern Phoebe	<i>Sayornis phoebe</i>	EAPH
Eastern Wood-Pewee	<i>Contopus virens</i>	EAWP
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	EVGR
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	GWWA
Gray Catbird	<i>Dumetella carolinensis</i>	GRCA
Great Blue Heron	<i>Ardea herodias</i>	GTBH
Great-crested Flycatcher	<i>Myiarchus crinitus</i>	GCFL
Hairy Woodpecker	<i>Picoides villosus</i>	HAWO
Hermit Thrush	<i>Catharus guttatus</i>	HETH
Herring Gull	<i>Larus argentatus</i>	HEGU
Hooded Merganser	<i>Lophodytes cucullatus</i>	HOME
House Wren	<i>Troglodytes aedon</i>	HOWR
Indigo Bunting	<i>Passerina cyanea</i>	INBU

(continued)

Appendix 2. Continued

Common name	Latin name	AOU code
Killdeer	<i>Charadrius vociferus</i>	KILL
Least Flycatcher	<i>Empidonax minimus</i>	LEFL
Magnolia Warbler	<i>Dendroica magnolia</i>	MAWA
Mallard	<i>Anas platyrhynchos</i>	MALL
Marsh Wren	<i>Cistothorus palustris</i>	MAWR
Mourning Dove	<i>Zenaida macroura</i>	MODO
Mourning Warbler	<i>Oporornis philadelphia</i>	MOWA
Nashville Warbler	<i>Vermivora ruficapilla</i>	NAWA
Northern Flicker	<i>Colaptes auratus</i>	YSFL
Northern Harrier	<i>Circus cyaneus</i>	NOHA
Northern Oriole	<i>Icterus galbula</i>	BAOR
Northern Parula	<i>Parula americana</i>	NOPA
Northern Waterthrush	<i>Seiurus noveboracensis</i>	NOWA
Olive-sided Flycatcher	<i>Contopus borealis</i>	OSFL
Ovenbird	<i>Seiurus aurocapillus</i>	OVEN
Pileated Woodpecker	<i>Dryocopus pileatus</i>	PIWO
Pine Warbler	<i>Dendroica pinus</i>	PIWA
Purple Finch	<i>Carpodacus purpureus</i>	PUFI
Red-breasted Nuthatch	<i>Sitta canadensis</i>	RBNU
Red-eyed Vireo	<i>Vireo olivaceus</i>	REVI
Red-tailed Hawk	<i>Buteo jamaicensis</i>	RTHA
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	RWBL
Ring-billed Gull	<i>Larus delawarensis</i>	RBGU
Rose-breasted Grosbeak	<i>Phœucticus ludovicianus</i>	RBGR
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	RTHU
Ruffed Grouse	<i>Bonasa umbellus</i>	RUGR
Rusty Blackbird	<i>Euphagus carolinus</i>	RUBL
Sandhill Crane	<i>Grus canadensis</i>	SACR
Scarlet Tanager	<i>Piranga olivacea</i>	SCTA
Sedge Wren	<i>Cistothorus platensis</i>	SEWR
Solitary Vireo	<i>Vireo solitarius</i>	SOVI
Song Sparrow	<i>Melospiza melodia</i>	SOSP
Spotted Sandpiper	<i>Actitis macularia</i>	SPSA
Swamp Sparrow	<i>Melospiza georgiana</i>	SWSP
Tree Swallow	<i>Tachycineta bicolor</i>	TRES
Turkey Vulture	<i>Cathartes aura</i>	TUVU
Veery	<i>Catharus fuscescens</i>	VEER
Virginia Rail	<i>Rallus limicola</i>	VIRA
White-breasted Nuthatch	<i>Sitta carolinensis</i>	WBNU
White-throated Sparrow	<i>Zonotrichia albicollis</i>	WTSP
Winter Wren	<i>Troglodytes troglodytes</i>	WTWR
Wood Duck	<i>Aix sponsa</i>	WODU
Wood Thrush	<i>Hylocichla mustelina</i>	WOTH
Yellow Warbler	<i>Dendroica petechia</i>	YWAR
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	YBFL
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	YBSA
Yellow-rumped Warbler	<i>Dendroica coronata</i>	MYWA
Yellow-throated Vireo	<i>Vireo flavifrons</i>	YTVI

Appendix 3. Results of points counts, listing total number of individuals and number of individuals/point in decreasing order of abundance for each habitat sampled in the Bad River Corridor, Wisconsin. Species codes according to American Ornithologist's Union, Appendix 2.

Aspen Clearcut			Aspen-Red Maple			Boreal Hardwood-Conifer			Bottomland Hardwoods		
SPP	#	#/PT	SPP	#	#/PT	SPP	#	#/PT	SPP	#	#/PT
WTSP	49	1.75	OVEN	54	2.45	OVEN	53	2.79	OVEN	33	2.06
NAWA	42	1.50	REVI	28	1.27	BTNW	26	1.37	AMRE	26	1.63
CSWA	40	1.43	CSWA	22	1.00	REVI	21	1.11	REVI	20	1.25
COYE	34	1.21	NAWA	20	0.91	NAWA	19	1.00	LEFL	15	0.94
GWWA	26	0.93	VEER	18	0.82	BLBW	10	0.53	VEER	12	0.75
VEER	26	0.93	BTNW	15	0.68	GCFL	9	0.47	RBGR	10	0.63
OVEN	25	0.89	WTSP	14	0.64	HETH	8	0.42	SOSP	8	0.50
ALFL	23	0.82	AMRE	10	0.45	VEER	7	0.37	MOWA	7	0.44
SOSP	22	0.79	BAWW	8	0.36	WIWR	7	0.37	WBNU	6	0.38
CEDW	15	0.54	COYE	8	0.36	BLJA	5	0.26	CEDW	5	0.31
RBGR	15	0.54	MOWA	8	0.36	BRCR	5	0.26	COYE	5	0.31
REVI	14	0.50	RBGR	8	0.36	MOWA	5	0.26	BAWW	4	0.25
MOWA	11	0.39	HETH	7	0.32	WTSP	5	0.26	BLJA	4	0.25
AMRO	9	0.32	BLJA	6	0.27	YBSA	5	0.26	CSWA	4	0.25
BAWW	9	0.32	GCFL	6	0.27	AMRO	4	0.21	AMRO	3	0.19
SWSP	8	0.29	YBSA	6	0.27	BAWW	4	0.21	BHCO	3	0.19
AMGO	7	0.25	GWWA	5	0.23	COYE	4	0.21	GCFL	3	0.19
GCFL	7	0.25	EAWP	4	0.18	CAWA	3	0.16	HTH	3	0.19
YSFL	7	0.25	SOSP	4	0.18	EAWP	3	0.16	YBSA	3	0.19
BHCO	6	0.21	YSFL	4	0.18	LEFL	3	0.16	BTNW	2	0.13
BLJA	6	0.21	AMRO	3	0.14	NOPA	3	0.16	NOWA	2	0.13
BCCH	5	0.18	BCCH	3	0.14	WBNU	3	0.16	WIWR	2	0.13
CAWA	5	0.18	CAWA	3	0.14	AMRE	2	0.11	WOTH	2	0.13
WBNU	5	0.18	CORA	3	0.14	BHCO	2	0.11	AMCR	1	0.06
RUGR	4	0.14	HAWO	3	0.14	CEDW	2	0.11	AMGO	1	0.06
SEWR	4	0.14	WIWR	3	0.14	CORA	2	0.11	BEKI	1	0.06
HETH	3	0.11	BHCO	2	0.09	CSWA	2	0.11	BLBW	1	0.06
RTHU	3	0.11	BLBW	2	0.09	PIWA	2	0.11	CHSP	1	0.06
RWBL	3	0.11	BRCR	2	0.09	RBGR	2	0.11	DOWO	1	0.06
YBSA	3	0.11	CEDW	2	0.09	RBNU	2	0.11	EAPH	1	0.06
AMRE	2	0.07	RBNU	2	0.09	SCTA	2	0.11	GRCA	1	0.06
GRCA	2	0.07	SCTA	2	0.09	YSFL	2	0.11	GWWA	1	0.06
HOWR	2	0.07	WBNU	2	0.09	BCCH	1	0.05	INBU	1	0.06
RBNU	2	0.07	AMWO	1	0.05	CHSP	1	0.05	MAWA	1	0.06
WIWR	2	0.07	BAOR	1	0.05	DOWO	1	0.05	NAWA	1	0.06
AMWO	1	0.04	COSN	1	0.05	EVGR	1	0.05	SOVI	1	0.06
BAOR	1	0.04	DOWO	1	0.05	MYWA	1	0.05	YBFL	1	0.06
BLBW	1	0.04	HOWR	1	0.05	RUGR	1	0.05	YWAR	1	0.06
BTNW	1	0.04	LEFL	1	0.05	SOSP	1	0.05	YSFL	1	0.06
GTBH	1	0.04	PIWO	1	0.05	YBFL	1	0.05	total	198	13.20
INBU	1	0.04	PUFI	1	0.05	total	240	12.63			
PIWA	1	0.04	RUGR	1	0.05						
PIWO	1	0.04	SWSP	1	0.05						
PUFI	1	0.04	total	297	13.50						
RTHA	1	0.04									
YTVI	1	0.04									
total	457	16.32									

(continued)

Appendix 3. Continued

Black Ash			Aspen Clearcut/Aspen-Red Maple Boundary			Aspen Clearcut/Boreal Hardwood-Conifer Boundary		
SPP	#	#/PT	SPP	#	#/PT	SPP	#	#/PT
REVI	33	1.65	OVEN	39	1.56	OVEN	35	1.75
SWSP	30	1.50	NAWA	35	1.40	NAWA	25	1.25
COYE	21	1.05	CSWA	34	1.36	WTSP	21	1.05
GCFL	20	1.00	WTSP	34	1.36	MOWA	17	0.85
OVEN	19	0.95	VEER	22	0.88	CSWA	16	0.80
VEER	13	0.65	REVI	21	0.84	REVI	15	0.75
AMRE	12	0.60	MOWA	19	0.76	COYE	12	0.60
SOSP	12	0.60	BLJA	18	0.72	SOSP	11	0.55
CEDW	10	0.50	GWWA	17	0.68	BLJA	10	0.50
RBGR	10	0.50	COYE	15	0.60	BTNW	8	0.40
BRGR	9	0.45	RBGR	15	0.60	GCFL	8	0.40
NOWA	9	0.45	AMRE	14	0.56	VEER	8	0.40
BLBW	7	0.35	ALFL	12	0.48	AMRE	7	0.35
NAWA	7	0.35	YBSA	12	0.48	BAWW	7	0.35
WBNU	7	0.35	BTNW	8	0.32	RBGR	7	0.35
AMRO	6	0.30	CAWA	8	0.32	WIWR	7	0.35
CSWA	6	0.30	CEDW	8	0.32	HETH	6	0.30
BAWW	5	0.25	GCFL	8	0.32	ALFL	5	0.25
BTNW	5	0.25	HETH	8	0.32	GWWA	5	0.25
LEFL	5	0.25	SOSP	8	0.32	BLBW	3	0.15
MOWA	5	0.25	BAWW	7	0.28	CAWA	3	0.15
WTSP	5	0.25	AMGO	6	0.24	HAWO	3	0.15
BLJA	4	0.20	EAWP	5	0.20	LEFL	3	0.15
DOWO	4	0.20	YSFL	5	0.20	NOPA	3	0.15
HETH	4	0.20	RUGR	4	0.16	PIWA	3	0.15
NOPA	4	0.20	SWSP	4	0.16	RBNU	3	0.15
EAWP	3	0.15	WIWR	4	0.15	YBSA	3	0.15
PUFI	3	0.15	AMRO	3	0.12	AMGO	2	0.10
YBSA	3	0.15	BHCO	3	0.12	AMRO	2	0.10
ALFL	2	0.10	HAWO	3	0.12	BCCH	2	0.10
BAOW	2	0.10	RBNU	3	0.12	BHCO	2	0.10
BCCH	2	0.10	BCCH	2	0.08	MYWA	2	0.10
CAWA	2	0.10	BWHA	2	0.08	YSFL	2	0.10
HAWO	2	0.10	PIWA	2	0.08	CEDW	1	0.05
SOVI	2	0.10	WBNU	2	0.08	EAWP	1	0.05
WIWR	2	0.10	AMCR	1	0.04	MODO	1	0.05
YBFL	2	0.10	BRGR	1	0.04	PIWO	1	0.05
YSFL	2	0.10	COSN	1	0.04	SCTA	1	0.05
AMGO	1	0.05	GRCA	1	0.04	SOVI	1	0.05
BHCO	1	0.05	RTHU	1	0.04	SWSP	1	0.05
CORA	1	0.05	SCTA	1	0.04	TRES	1	0.05
GTBH	1	0.05	SEWR	1	0.04	total	274	13.75
GWWA	1	0.05	SOVI	1	0.04			
RBNU	1	0.05	total	418	16.72			
RTHU	1	0.05						
RWBL	1	0.05						
TRES	1	0.05						
WOTH	1	0.05						
YWAR	1	0.05						
YTVI	1	0.05						
total	311	15.55						

(continued)

Appendix 3. Continued

Aspen-Red Maple/Black Ash Boundary			Boreal Hardwood-Conifer/Black Ash Boundary			Boreal Hardwood-Conifer/Black Ash Boundary (cont.)		
SPP	#	#/PT	SPP	#	#/PT	SPP	#	#/PT
OVEN	24	1.60	OVEN	24	1.50	RTHU	1	0.06
REVI	16	1.07	REVI	18	1.13	RUBL	1	0.06
VEER	16	1.07	SWSP	18	1.13	SOVI	1	0.06
COYE	14	0.93	GCFL	15	0.94	VIRA	1	0.06
CSWA	14	0.93	SOSP	12	0.75	YBFL	1	0.06
SWSP	12	0.80	BTNW	11	0.69	total	286	17.88
BAWW	10	0.67	NOPA	11	0.69			
BTNW	10	0.67	RWBL	11	0.69			
WTSP	10	0.67	COYE	10	0.63			
CAWA	9	0.60	LEFL	10	0.63			
HETH	9	0.60	BLBW	9	0.56			
AMRE	7	0.47	WIWR	9	0.56			
BRCR	7	0.47	AMRO	8	0.50			
MOWA	7	0.47	BHCO	8	0.50			
NAWA	7	0.47	BRCR	8	0.50			
GCFL	6	0.40	RBGR	8	0.50			
AMRO	5	0.33	NAWA	7	0.44			
ALFL	4	0.27	VEER	5	0.38			
BCCH	4	0.27	WTSP	5	0.38			
BLJA	4	0.27	HETH	5	0.31			
CEDW	4	0.27	YBSA	5	0.31			
RBGR	4	0.27	YSFL	5	0.31			
SOSP	4	0.27	YTVI	4	0.25			
YSFL	4	0.27	AMRE	3	0.19			
BHCO	3	0.20	BCCH	3	0.19			
EAWP	3	0.20	CSWA	3	0.19			
GRCA	3	0.20	EAWP	3	0.19			
LEFL	3	0.20	RBNU	3	0.19			
NOPA	3	0.20	WBNU	3	0.19			
NOWA	3	0.20	AMGO	2	0.13			
YBSA	3	0.20	BAOR	2	0.13			
BLBW	2	0.13	BLJA	2	0.13			
WBNU	2	0.13	EAKI	2	0.13			
WIWR	2	0.13	HAWO	2	0.13			
WOTH	2	0.13	HOWR	2	0.13			
AMGO	1	0.07	MOWA	2	0.13			
CHSP	1	0.07	NOWA	2	0.13			
GWWA	1	0.07	PUF1	2	0.13			
HAWO	1	0.07	SEWR	2	0.13			
SOVI	1	0.07	TRES	2	0.13			
YBFL	1	0.07	WOTH	2	0.13			
YTVI	1	0.07	YWAR	2	0.13			
total	247	16.53	BAWW	1	0.06			
			BWHA	1	0.06			
			CAWA	1	0.06			
			GRCA	1	0.06			
			KILL	1	0.06			
			MALL	1	0.06			
			MAWA	1	0.06			
			OSFL	1	0.06			
			PIWO	1	0.06			

(continued)

Appendix 3. Continued

Bottomland Hardwoods/ Black Ash Boundary			Bottomland Hdws/Boreal Hardwood-Conifer Boundary			Aspen-Red Maple/Boreal Hardwood-Conifer Boundary		
SPP	#	#/PT	SPP	#	#/PT	SPP	#	#/PT
REVI	21	1.75	OVEN	20	2.50	OVEN	24	2.67
OVEN	16	1.33	REVI	12	1.50	BTNW	11	1.22
LEFL	13	1.08	AMRE	8	1.00	NAWA	9	1.00
VEER	12	1.00	VEER	8	1.00	REVI	9	1.00
AMRE	10	0.83	BLBW	6	0.75	HETH	7	0.78
GCFL	8	0.67	BTNW	5	0.63	GCFL	6	0.67
RWBL	8	0.67	AMRO	4	0.50	YBSA	5	0.56
SOSP	8	0.67	LEFL	4	0.50	MOWA	4	0.44
AMRO	7	0.58	NAWA	3	0.38	AMRE	3	0.33
RBGR	6	0.50	RBGR	3	0.38	CSWA	3	0.33
COYE	5	0.42	WOTH	3	0.38	LEFL	3	0.33
MOWA	5	0.42	WTSP	3	0.38	VEER	3	0.33
BTNW	4	0.33	YBSA	3	0.38	WIWR	3	0.33
CORA	4	0.33	RWBL	2	0.25	BAWW	2	0.22
WBNU	4	0.33	WODU	2	0.25	BLBW	2	0.22
AMGO	3	0.25	BAWW	1	0.13	CORA	2	0.22
BLBW	3	0.25	BHCO	1	0.13	MYWA	2	0.22
BRGR	3	0.25	BLJA	1	0.13	PIWA	2	0.22
NOPA	3	0.25	BRGR	1	0.13	SOVI	2	0.22
NOWA	3	0.25	CORA	1	0.13	WTSP	2	0.22
WTSP	3	0.25	GCFL	1	0.13	AMCR	1	0.11
YTVI	3	0.25	GWWA	1	0.13	AMRO	1	0.11
BAEA	2	0.17	MOWA	1	0.13	BAOR	1	0.11
CEDW	2	0.17	NOPA	1	0.13	BBCU	1	0.11
EAWP	2	0.17	PIWA	1	0.13	BHCO	1	0.11
HAWO	2	0.17	RUGR	1	0.13	BRGR	1	0.11
HETH	2	0.17	SOSP	1	0.13	COYE	1	0.11
SWSP	2	0.17	WIWR	1	0.13	EAWP	1	0.11
WOTH	2	0.17	total	99	12.38	HAWO	1	0.11
YBSA	2	0.17				NOPA	1	0.11
YWAR	2	0.17				PIWO	1	0.11
YSFL	2	0.17				RBGR	1	0.11
AMCR	1	0.08				RBNU	1	0.11
BAOR	1	0.08				SCTA	1	0.11
BAWW	1	0.08				WBNU	1	0.11
BHCO	1	0.08				YBFL	1	0.11
BLJA	1	0.08				YSFL	1	0.11
CSWA	1	0.08				total	121	13.44
INBU	1	0.08						
NAWA	1	0.08						
SOVI	1	0.08						
WIWR	1	0.08						
YBFL	1	0.08						
total	183	15.25						

Winter Roost Habitat and Diet of Short-eared Owls (*Asio flammeus*) in Door County, Wisconsin

*During November through March of 1994–95, Short-eared Owls (*Asio flammeus*) were observed at and near a Christmas tree plantation in southern Door County, Wisconsin. Within the Christmas tree plantation, observation of owls, their pellets, and their tracks indicated its use as a communal roosting site.*

*Analysis of 25 studies containing information on 30 Short-eared Owl winter roosting sites using mean January temperatures from atlases revealed a tendency for them to roost in “cover” at colder temperatures (mean January temperature $< -1.1^{\circ}\text{C}$) and in areas of “no cover” at warmer temperatures (mean January temperature $> -1.1^{\circ}\text{C}$). The percent occurrence of diet items in 136 pellets was 99.3% meadow vole (*Microtus pennsylvanicus*), 1.47% house mouse (*Mus musculus*), 0.47% woodland deer mouse (*Peromyscus maniculatus*), and 0.47% Norway rat (*Rattus norvegicus*). Mean estimated mass ($\pm$ SE) of meadow vole prey was 33.19g ($\pm$ 0.37g).*

by Andrew Kinziger

The Short-eared Owl (*Asio flammeus*) is distributed throughout most of North America, South America, Europe, and Asia (Holt and Leasure 1993). In North America it makes irregular migrations, often stopping in areas with abundant rodent populations (Clark 1975, Holt and Leasure 1993). At its wintering locations, it

communally roosts in a variety of habitats. Some variation in roosting behavior has been partially explained by Bosakowski (1986), who demonstrated that snow prompted Short-eared Owls to roost in conifers. In addition to snow cover, I hypothesize that temperature may affect Short-eared Owl winter roosting habitat.

Short-eared Owls feed primarily on microtine prey in North America (Clark 1975, Holt and Leasure 1993). However Korpimäki (1986) demonstrated that owl feeding behavior may change according to geographical location. A recent occurrence of wintering Short-eared Owls in Door County, Wisconsin provided the opportunity to collect data on diet and roosting habitat for comparison with other geographical locations.

METHODS

The study site, located in southern Door County, Wisconsin (T26N,R24E,S23), contained a Christmas tree plantation of approximately 0.8 km². The plantation is composed of spruce and pine trees ranging from 0.5m-5m in height. It is surrounded by cultivated fields and fields set aside for the Conservation Reserve Program. Short-eared Owls occupied this area from approximately November to March of 1994-95. Before January 1995, the area was estimated to contain approximately 100 Short-eared Owls (Lange 1995), as well as Northern Harriers (*Circus cyaneus*), Rough Legged Hawks (*Buteo lagopus*), and American Kestrels (*Falco sparverius*).

Short-eared Owl roosting locations were assessed using two methods. The first included searches for regurgitated pellets within the Christmas tree plantation. The other consisted of a visit to the plantation the morning after a March snowstorm. During this trip an attempt was made to flush and estimate the number of owls in the Christmas tree plantation, and record notes on the position of the "tracks" made by the ground roosting owls.

To assess geographical variation in winter roosting habitat, I examined 25 studies containing information on 30 Short-eared Owls winter roost sites throughout North America. For the purpose of this study, winter included the months of November, December, January, February, and March, and literature containing information about roosting during any or all of these months is included in the analysis. I assigned the reported roosting sites to categories of "cover" and "no cover." Sites considered to contain "cover" were those in or near trees or woody or other debris (e.g., conifers, piles of lumber). "No cover" roosting areas contained light-colored vegetation or substrate (e.g., prairies, dunes). Each roosting site was also assigned to a temperature category of $< -1.1^{\circ}\text{C}$ ($< 30^{\circ}\text{F}$) or $> -1.1^{\circ}\text{C}$ ($> 30^{\circ}\text{F}$) using isotherms of mean January temperatures (Gerlach 1970, Garrett 1985, Mattson and Mattson 1990). The data were entered into a 2×2 contingency table and examined with Fisher's Exact Test (Sokal and Rohlf 1981). One-tailed test was used because I expected colder temperatures to be associated with "cover."

Pellets regurgitated by the Short-eared Owls were used as indicators of diet. Collections from the roosting site on 4 March and 14 April 1995 were brought to the lab for analysis. Fragmented pellets from both collections were eliminated from the analysis, and pellets in the second collection were differentiated from those of Northern Harrier by estimating bone percentage and discarding questionable pellets (Holt et al. 1987). The pellets were dried and teased apart with forceps, and prey remains were identified to species using Jones and Manning

(1992) and Burt (1957). Undamaged crania of meadow voles (*Microtus pennsylvanicus*), the dominant prey in this study, were used to estimate body mass. Measurements of upper diastema (UD), palatine foramen (PF) and rostral breadth (RB) were completed to the nearest 0.01mm with a digital caliper. These measurements were performed according to Blem et al. (1993) and entered into their equation for estimation of body mass in grams (N): $N = 17.52RB + 0.72PF + 6.18UD - 100.89$.

RESULTS

The Christmas tree plantation served as winter roost habitat for Short-eared Owls. This was indicated by the regular presence of owls and their pellets in the plantation. Other evidence included flushing approximately 30–35 Short-eared Owl and observation of owl “tracks” in the plantation the morning after a March snowstorm.

Winter roost habitat as reported in the literature is summarized in Table 1. The Fisher Exact Test suggested a tendency for Short-eared Owls to roost relatively more often in “cover” at sites with mean January temperatures $< -1.1^{\circ}\text{C}$ ($< 30^{\circ}\text{F}$) and in areas of “no cover” where mean January temperatures are $> 1.1^{\circ}\text{C}$ ($> 30^{\circ}\text{F}$) (one tailed test, $p = 0.0152$) (Table 2).

Comparison of the two pellet collections revealed no obvious differences in prey size, and therefore the data were pooled (e.g., paired t-test of PF measurements $p = 0.87$). The 136 pellets had a mean length ($\pm$ SE) of 43.54mm (± 1.07 mm) and contained 191 prey items (mean number of prey items per pellet 1.43), with a maximum

of 3 prey items in a single pellet. Meadow voles comprised 97.9% of the prey items, while house mouse (*Mus musculus*), woodland deer mouse (*Peromyscus maniculatus*), and Norway rat (*Rattus norvegicus*) constituted the remaining portion (Table 3). The mean estimated weight ($\pm$ SE) of 185 meadow voles recovered from the pellets was 33.19g (± 0.37 g) (Figure 1).

DISCUSSION

Short-eared owls in their winter roosts are thought to prefer light-colored vegetation (“no cover”) over dark-colored vegetation (Craighead and Craighead 1956), and this roosting behavior has been observed by several researchers (Table 1). Light-colored vegetation is believed to conceal the owls by matching their light tawny colors (Craighead and Craighead 1956). However, it has been noted in other instances that owls roost in dark-colored vegetation such as conifers (Table 1). A third, intermediate condition has been established, in which Short-eared Owls move from ground roosts in light-colored vegetation to conifer roosts when snow is present (Bosakowski 1986). It has been hypothesized that this transition is due to the change in color of the roosting habitat to the white color of the snow, which does not adequately conceal the owls (Banfield 1947).

Although camouflage may be important in winter roost site selection, thermal characteristics of the roosting habitat may also be important. For instance, Bald Eagles (*Haliaeetus leucocephalus*) occupy winter roosts with the lowest mean and maximum wind speeds (Buehler et al. 1991). Further-

Table 1. Short-eared Owl studies roost locations, winter roost habitats, and assigned habitat and temperature categories.

Study	Location	Original description of winter roost habitat	Habitat category	Temperature category (°C)
Tomkins 1936	entrance to the Savannah River, Savannah, Georgia	"All along the dunes the roof rats and mice had their dens . . . This was in the same places used as day resting stations by the owls"	no cover	> -1.1
Baumgartner and Baumgartner 1944	Stillwater, Oklahoma	"several roosts were found on the grassy slopes"	no cover	> -1.1
Kirkpatrick and Conway 1947	Tippecanoe County, Indiana	"Their [short-eared owls] use of the wheat stubble for roosting was indicated by numerous pellets deposited there"	no cover	< -1.1
Weller et al. 1955	Columbia, Central Missouri	"Marsh Hawks were observed hunting over a field in the upland prairie region . . . Later observations revealed . . . Short-eared Owls feeding and roosting there."	no cover	> -1.1
Craighead and Craighead 1956	Ann Arbor, Michigan	"almost without exception, Short-eared Owls roost in timothy, fox-tail grass, brome-grass, or other light colored vegetation"	no cover	< -1.1
Reed 1959	Shiawassee County, Michigan	"resting on snow-covered ground, or roosting in the trees and on fenceposts . . . apple orchard where owls were said to roost frequently and along fence rows"	no cover	< -1.1
Long and Wiley 1961	Jasper County, Missouri	"pellets in grass and on the ground in a treeless, prairie habitat . . . owls were congregated on a semi-circular mud-bank in a flat area that is grassy and marshy" (pellets found in grassy area)	no cover	> 1.1
Graber 1962	Two sites in Champaign County, Central Illinois	"roosting sites of Short-eareds were grassy-weedy fields or grass grown slopes of drainage ditches"	no cover	< -1.1
Weller and Fredrickson 1963	Johnston County, Iowa	"short-eareds roosted in fields of tall grass and forbs"	no cover	< -1.1
Fitzner and Fitzner 1975	Whitman County, Southeastern Washington	"Short-eared Owl roosting site . . . Palouse Prairie vegetation . . . Idaho fescue, bluebunch wheatgrass"	no cover	< -1.1
Page and Whitacre 1975	Bolinas Lagoon, Point Reyes Peninsula, California	"Short-eared Owls roosted in the dunes"	no cover	> -1.1
Machniak and Feldhamer 1993	Saline County, Illinois	"roost on the ground in fields of foxtail, broomsedge little blue stem, switchgrass and fescue"	no cover	> -1.1
Hendrickson and Swan 1938	Ames, Iowa	"owls roosted in . . . the thicket" (logs and brushpiles)	cover	< -1.1
Snyder and Hope 1938, Banfield 1947	Toronto region, Canada	"roosting in ornamental evergreen planting about the York Downs Golf Course"	cover	< -1.1
Terres and Jameson 1943	Schuyler County, Central New York	"Short-eared Owls roosted in a white pine grove	cover	< -1.1
Johnston 1956	San Francisco Bay region, California	"composed mainly of leaf-out <i>Grindelia</i> , but there is a varying admixture of <i>Distichlis</i> and <i>Salicornia</i> . . . Short-eared Owls find roosting cover in daylight hours in these tangles"	cover	> -1.1

(continued)

Table 1. Continued

Study	Location	Original description of winter roost habitat	Habitat category	Temperature category (°C)
Short and Drew 1962	Ingham County, Southern Michigan	"communal roost consisting of a pile of discarded lumber and branches"	cover	< -1.1
Hoyt 1962	Ludlowville, near Ithaca, New York	"apparently were roosting in the cedars"	cover	< -1.1
Munyer 1966	Central Illinois	"All roosts were conifers"		
	Coles County		cover	< -1.1
	McLean County		cover	< -1.1
Clark 1975	Woodford County	"Abandoned limestone quarry with occasional stumps"	cover	< -1.1
	Central New York			
	Cayuga County		cover	< -1.1
Ponshair 1976	Niagara County	"Scotch pine grove, swale, auto junkyard, storage for heavy machinery"	cover	< -1.1
	Seneca County (1)	"Stubble fields, stump piles"	cover	< -1.1
	Seneca County (2)	"Abandoned gravel pit"	cover	< -1.1
	Ottawa County, Michigan	"a scotch pine, <i>Pinus sylvestris</i> , plantation consisting 20 acres which has been a roosting ground for short-eared owls"	cover	< -1.1
Colvin and Spaulding 1983	Ohio, coast of Lake Erie	"roost locations at the base of ditch banks, logs and signposts in or boarding the field"	cover	< -1.1
Bosakowski 1986	Lyndhurst, New Jersey	"4-meter Austrian pines or 1m common junipers-roosted 1-2m above ground, or in <i>phragmite communis</i> marsh (reeds 2-3m)"	cover	< -1.1
This Study	Door County, Northeast Wisconsin	Christmas tree plantation (spruce and pine 1-2.5m in height)	cover	< -1.1

more, Walsberg (1986) determined that protection from wind or forced convection is of great importance in nocturnal roosting locations of Phainopepla (*Phainopepla nitens*). Descrip-

tions of Short-eared Owl winter roost site selection suggest a similar behavior, i.e., roosting in areas that would shelter them from harsh weather con-

Table 2. A 2 × 2 contingency table showing the number of Short-eared Owl roosts in "cover" and in "no cover" at colder (< -1.1°C) and warmer (> -1.1°C) temperatures.

Roost	< -1.1°C	> -1.1°C	Total
"Cover"			
Observed	16	1	17
Expected	13.03	3.97	
"No Cover"			
Observed	7	6	13
Expected	9.97	3.03	
Total	23	7	30

Table 3. Number and percent occurrence (number pellets with item/total number of pellets × 100) of prey items occurring in the diet of Short-eared Owls.

Species	Number	Percent occurrence
Meadow Vole (<i>Microtus pennsylvanicus</i>)	187	99.3
House Mouse (<i>Mus musculus</i>)	2	1.47
Deer Mouse (<i>Peromyscus maniculatus</i>)	1	0.47
Norway Rat (<i>Rattus norvegicus</i>)	1	0.47

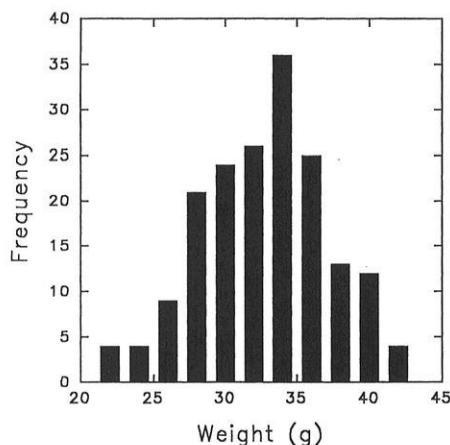


Figure 1. Frequency distribution of estimated meadow vole weights.

ditions (Hendrickson and Swan 1938, Short and Drew 1962, Munyer 1966, Clark 1975, Ponshair 1976). My analysis suggests that roosting behavior varies with geographic location and that temperature in addition to snow cover is an important factor affecting roost sites of Short-eared Owls.

According to a local resident, Short-eared Owls used the Christmas tree plantation roost site in the winter of 1987–88 in addition to the winter of 1994–95. During both years, local residents also noted large numbers of meadow voles. A nomadic specialist, the Short-eared Owl seems to have increased numerically in response to large meadow vole populations. This type of response has been documented for Short-eared Owls by Korpimäki and Norrdahl (1991) in western Finland. Many studies throughout North America also show a correlation between Short-eared Owls and the presence of large populations of small mammals illustrating that the Short-eared Owls' response to small rodents is widespread (Tomkins 1930, Synde

and Hope 1938, Terres and Jameson 1943, Baumgartner and Baumgartner 1944, Kirkpatrick and Conway 1947, Weller et al. 1955, Stegeman 1957, Reed 1959, Long and Wiley 1961, Clark 1975, Fitzner and Fitzner 1975, Baker and Brooks 1981). Nevertheless, other studies indicate that Short-eared Owls also prey occasionally upon birds and bats (Munro 1918, Huey 1926, Page and Whitacre 1975, Johnston 1956, Fisler 1960).

Adult meadow voles in Wisconsin weigh 36–56g (Jackson 1961). Based on my meadow vole mass estimates (mean = 33.19g), the prey eaten by the Short-eared Owl in this study can be categorized as subadults. Using the same methods, Blem et al. (1939) in northwestern Montana estimated mean weights ($\pm$ SE) of meadow vole prey to be 30.3g ($\pm$ 0.6g). My results suggest a geographic consistency in prey size of Short-eared Owls in North America, although these results may be confounded by the time of year, geographic size differences in voles, or other factors (Blem et al. 1993). In addition, some error may have resulted from estimating body mass with equations developed for other studies (Blem et al. 1993).

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1996—A Memorable Year

The author reflects on his “big year” 1996. Included are highlights of an eventful year of birding.

by Daryl Tessen

With the advent of another year birders speculate about what it will bring. Perhaps there will be additions to one's life and state lists or there will be that special event providing pleasant memories for many years. 1996 contained all of these. It commenced with two state first records—a Glaucous-winged Gull discovered by Noel (Cutright) and Tom (Uttech) at Port Washington on New Year's Day—and a Scott's Oriole coming to an Adams County feeder. This was confirmed by Sam (Robbins) and Bill (Foster) a few days later. The pace never slackened until summer when a quieter period arrived that remained through December. Despite this there still were enough rarities to keep the adrenalin flowing and the car mileage mounting.

One marvelous aspect to birding is you can set your own level of involvement. Thus one can be a backyard birder or broaden your coverage to include a variety of state bird haunts such as are involved with the W.S.O. field trips. Last, and the ultimate due to the commitment required, is doing a big year—finding as many birds within our state as possible during the year. Con-

trary to popular belief one does not race around the state for 365 days. Most birders do not have the time. Besides, too much of a good thing, even birding, loses something over that length of time.

The decision when to do a “big year” is up to the individual. Some birders prefer declaring their intent at the beginning of the year. However, if the migrations or year in general do not produce the necessary rarities, you will almost certainly not attain your goal. Other birders, myself included, prefer to watch how the first half of the year develops before deciding to do a “big year.” Either way, if by the end of May your list has reached 275–290, chances are excellent for attaining the threshold mark—300. Prior to this year only four birders had reached this level: Randy Hoffman—301, the first to accomplish it, Kay Burcar—313, with the current record, Bob Domagalski—311, and myself—300, 304, 305 and 308. However, during 1996, three birders exceeded 300 including Mark Peterson—306, Tom Uttech—301 and myself—328. In addition several other birders indicated that, had they cov-

ered several additional sites, they too would have surpassed 300.

What made this year generate such remarkable results? The key ingredients included an almost endless supply of rarities, both northern owl and winter finch irruptions, and an outstanding, albeit considerably delayed, spring migration. Following are the highlights of my big year.

January 3—Dawn finds Bettie (Harriman) and me heading for the Milwaukee/Port Washington area for a day of birding. And what a day it proves to be! Along the Ozaukee-Milwaukee County line we encountered Bob D. watching the Townsend's Solitaire plus a mixed flock of robins and Cedar Waxwings. The next stop is the feeder where both a Varied Thrush and Hermit Thrush, White-throated Sparrow and both redpolls prove most cooperative. While enjoying them, Sam and Bill arrive. Next stop is Port Washington for the Glaucous-winged Gull. Almost immediately it is located in the harbor. Our group joins John (Idzikowski) and Tom U. along the walkway for better views of the gull as it swims and harasses other gulls. Also present are Great Black-backed Gulls and Glaucous Gulls. While warming up during lunch at the local restaurant a Peregrine Falcon arrives and commences harassing the gulls. Back for another look at the Glaucous-winged and then on to Milwaukee's Harbor Island where Short-eared Owls and Thayer's Gulls are sighted. The day's tally is 47 species!

January 4—North to Shawano where both a Spotted Towhee and Eastern Towhee are coming to a feeder. After a cold half hour wait behind the garage, I am warming myself in the car when, of course, both birds appear.

January 6—During the 5th Mark (Korducki) and I are conversing at my place when two phone calls, from Mary (Donald) and Sam, indicate a Scott's Oriole is coming to an Adams feeder. As I enter Adams at dawn the bank thermometer reads -17! Already present are Mark and Dennis (Gustafson). The oriole soon appears as do many other birders during the next two hours. During this time the second year male alternates between eating oranges, sunning itself on the woodpile and resting in adjacent trees and also the doghouse!

January 8—A call the previous evening from Sylvia (Barbarich) tells of a Harris' Sparrow frequenting a yard south of Fremont. Dawn finds me parked along the road with just enough light to distinguish the Harris' on the tray feeder. It remains until a passing car scares it.

January 13—At Virmond Park the male Barrow's Goldeneye is located after a lengthy search. Near Port Washington a large mixed flock of Snow Buntings (500), Horned Larks (60) and Lapland Longspurs (10) is feeding in a field. At Two Rivers/Manitowoc 19 Glaucous Gulls are present. With terrible weather for the duration of the month the year's list is at 82.

February 10—A call from Tom (Schultz) the previous evening alerts me to a Northern Hawk Owl near Montello, an unusual southern sighting. As there is a W.S.O. board meeting in Stevens Point today I decide to drive to the meeting via Montello. An unproductive hour is spent searching the area during which Tom Wood joins me. It is almost time to leave for Point when Tom, Jeff and Scott (Baughman) arrive. Of course they immediately locate the owl sitting on a telephone pole.

Amazing the "luck" of some birders and how blind others can be. Quiet guys!!

February 20—Deciding to try for the Great Gray Owl in Wood County I arrive shortly after dawn. A frustrating hour is spent searching for it, with the only noteworthy find a skunk meandering across a field. Making one last drive around the area I suddenly notice a large owl in a field—the Great Gray. Within minutes it flies back into the adjacent woods. During the return home a short diversion to the Mead W.A. yields 25 Greater Prairie-Chickens in a corn field with 100+ Common Redpolls feeding along the road.

February 22—A drive to the Hiles/Three Lakes area is most productive as a variety of winter finches, Gray Jays, Boreal Chickadees plus a Spruce Grouse and Black-backed Woodpecker are observed.

February 25—A morning call from Mark indicates a female King Eider is in the Milwaukee harbor. Obligations prevent my leaving until afternoon. Trying to find the eider in the large scaup/golden-eye raft proves challenging but eventually it is located. For the next hour it is enjoyed as it mingles with the other ducks. The return to Appleton finds migrating blackbird flocks along the highway, a most welcome harbinger of spring especially after this winter. February ends with 103.

March 1—After an unsuccessful attempt last evening to see a Ross' Goose that Don (Nussbaum) had located at Winneconne I am back this morning. The bird is sitting on the ice with Canadas. While watching it and various migrant ducks an eagle approaches. As it soars overhead it is apparent that it is not the expected Bald but rather a Golden Eagle.

March 8—While finishing lunch the phone rings. Mark Peterson wants to know how rapidly I can get to his place. There is a Boreal Owl sleeping in a yard several miles from his home! In less than an hour I pick up Mark and we head for the site, negotiating the sharp curves along the way (one white knuckled passenger). Upon arriving we discover the boreal has relocated to a berry tree that is still sheltered from the cold wind. For the next hour it alternates between dozing and watching for mice. The bird proves remarkably tame, allowing us to approach quite close. Soon after we leave it also departs. Diligent searching by other birders late this day and the next unfortunately fail to relocate the owl.

March 10—The W.S.O. Milwaukee field trip is almost frozen out as ice is everywhere. Only a Peregrine Falcon is found atop one of the high rises. Consequently the trip moves north to Port Washington where several migrant ducks plus two Greater White-fronted Geese and a breeding plumaged male Black Scoter are enjoyed. At Sheboygan several Thayer's Gulls, Glaucous Gulls and Great Black-backed Gulls are present while at Two Rivers there is an Iceland Gull and seven Glaucous Gulls.

The remainder of the month has the usual early spring migrants highlighted by 22 White-fronted Geese at Menasha's Jefferson Park and a Ross' Goose at the Harvey-DM pond on the W.S.O. Arlington field trip. The month concludes with 133.

April 3—Checking the gulls in the Two Rivers/Manitowoc area on this blustery afternoon proves most fortunate. Due to the strong northeasterly winds and occasional rain the gulls have been driven into the harbors and along the beach. The gathering is im-

pressive with 14 Great Black-backed Gulls, 6 Glaucous Gulls, single Thayer's Gull and Iceland Gull plus a Lesser Black-backed Gull. However, the star of the day proves to be a smaller gull sitting amongst the Ring-billeds and Herrings on the ice at the Manitowoc marina. The black spot behind the eye, black half collar, black bill and legs with black on the wings and tail proclaim it to be a first winter Black-legged Kittiwake. As I am watching the kittiwake in a driving rain, it takes flight, heading for the harbor and lake. Trying to get one last view I jump out of my car, startling two small ducks that are nearby, Harlequins.

April 11—Near Dousman a Carolina Wren is singing in the area where it has wintered. Elsewhere the first kinglets and Yellow-rumped Warblers are found plus a Red-throated Loon near Cleveland.

April 15—Around supper time Don calls telling of a male Eurasian Wigeon he has seen near Shiocton. Practically inhaling my meal I arrive at the diked area within the hour. Sylvia has been canvassing the site for some time with no success. Joining her we spend another uneventful half hour until the Eurasian suddenly emerges from behind a group of American Wigeon. Until sunset we watch it feeding and attempting to court female Americans. In addition to the various ducks and shorebirds present flock after flock of Tundra Swans commence arriving. By the time we leave about 1500 swans have settled in for the night.

April 22—An Atlas meeting in the evening at Horicon allows me time to stop at Harrington Beach S.P. where an Eared Grebe and all three scoters are present. On the west side of the

marsh a Snowy Egret is feeding in a small pond.

April 25—A Little Blue Heron is accompanying other herons at Atkinson Marsh.

April 28—Six warbler and three thrush species are found along the trails at Heckrodt Park, a much needed boost to the seemingly endless wintery weather. In addition Cattle Egrets are feeding along Hwy 41 north of Green Bay. April concludes with 198.

May 4—The Yellow-crowned Night-Heron that has been residing in a Racine pond is located despite the "army" of first day fishermen. Moving north along Lake Michigan turns up a Willet at Milwaukee's Coast Guard Impoundment, seven American Avocets settling on a beach north of Cleveland plus six additional Willets at Manitowoc's impoundment.

May 7—During an evening ride in the Shiocton area a Marbled Godwit is feeding in a flooded field along CTH P.

May 9—Back in the Shiocton area again but this time a Hudsonian Godwit is present.

May 11—A Big Day count tallies 166 species including Red-necked Grebe and Eared Grebe, Snowy Egret and Cattle Egret, Bobwhite, King Rail, Stilt Sandpiper and Lark Sparrow.

May 14—A Worm-eating Warbler is on the ground by the Heckrodt parking lot as I arrive.

May 16—An unsuccessful search for a Scissor-tailed Flycatcher in Shawano County is appeased with a Ruff among the shorebirds along Bischoff Road near Shiocton.

May 19—A Big Day with Tom, Jeff and Scott produces 184 species including Yellow Rails at Comstock Bog, Snowy Egrets and Cattle Egrets at Hor-

icon Marsh, a Black-necked Stilt at the C pond in northern Fond du Lac County, an Iceland Gull at Two Rivers and an Orchard Oriole by Cleveland.

May 21—Returning to Lake Maria produces the Western Grebe missed during the Big Day. Along Bischoff Road two male Red-necked Phalaropes are actively feeding with other shorebirds. Chuck (Sontag) calls during the afternoon indicating both Laughing Gulls and Franklin's Gulls are at Manitowoc. That evening, with Chuck's help, both are located.

May 23—A Big Day with Mark P. turns up 175 species including four King Rails at the Rat River W.A., a total of nine different gulls plus a Mockingbird at Seagull Bar in Marinette.

May 28—A call from Bettie the previous evening indicates Red Knots are in Oshkosh. This morning three are in company with the numerous Ruddy Turnstones feeding on the lawn in Menominee Park.

May 29—The morning is spent birding several southwestern parks. At Governor Dodge a White-eyed Vireo is on territory. At Wyalusing along the entrance road a Bell's Vireo is likewise on territory. While trying to view it a warbler is singing nearby. Finally "tuning in" to its song I discover that it is a Prairie Warbler. Within minutes the bird moves into view, eventually coming to within a few feet as it forages in the shrubs. At the registration station a singing Kentucky Warbler attracts my attention. Distracting me is Randy Hoffman who arrives while I am looking for the Kentucky. Along the Long Valley Road we encounter Mark and Kathy Korducki. By the time I leave Wyalusing the Yellow-throated Warbler, Hooded Warbler and Yellow-breasted Chat have been located. On the return

to Appleton a Western Kingbird is perched on a wire in eastern Grant County, an Eared Grebe is on the V pond in Dane County while a late Rough-legged Hawk is hunting near the Rat River W.A.

As May concludes it is most apparent that these first five months have been phenomenal for the year's list is currently at an unbelievable 307! This is only one away from my personal high and six from Kay's record.

June 5—After a long night ride to see the pair of Loggerhead Shrikes south of Monroe one of them is located.

June 6–9—The W.S.O. convention is being held in Superior, providing an opportunity to bird this unique area. Due to some concerns I am uncertain until mid-day of the 6th that I will be able to attend. That evening finds me arriving at Crex Meadows W.A. where I team up with Mark and Harold (P.). By sunset we have tallied Trumpeter Swans, Sharp-tailed Grouse, Yellow Rail, LeConte's Sparrow, and Nelson's Sharp-tailed Sparrow. We even place a call to the pre-convention group which is staying at the local motel to help them with their morning birding. (Amazing how early some birders go to bed!) After a cold night on the refuge most of the aforementioned birds are relocated before heading to Superior. That evening and the next two days are filled with good birds and friends. The Saturday trip to Stone's Bridge yields two predawn Saw-whet Owls plus several Connecticut Warblers and Sharp-tailed Grouse. In the afternoon a group of convention goers head for Wisconsin Point where a Whimbrel provides entertainment.

Upon returning home the evening of the 9th a phone call from Jim

(Frank) tells of a Tricolored Heron at Horicon Marsh that he discovered while on his way home.

June 10—Arriving at Horicon Marsh shortly after dawn no Tricolored can be located along Hwy 49. Quite some time later it suddenly emerges from behind the cattails. For the next half hour the heron feeds along the main ditch in the mist and fog, a memorable sighting for #313.

July 2—News comes of a Kirtland's Warbler located by Robert (Spahn) while doing an atlas block in Vilas County. Despite the forecast of possible bad storms I decide to leave during the night in hopes of reaching the site about dawn. The weather proves as bad as forecast with torrential rains and sharp lightning. Fortunately along the way the storms move on and the clouds break. However just before arriving a fog bank moves in from the north. Despite this new problem the Kirtland's soon commences singing in a jackpine stand. During the next hour it sings several additional times at different sites in its territory including once right next to me. While only a faint glimpse of the bird is possible due to the fog it is nevertheless memorable as this represents #314 for the year. (Sorry Kay) The remainder of the month is rather quiet except for the two Tricolored and Little Blue Herons plus increasing shorebird numbers at Horicon Marsh.

August 13—Checking on shorebirds near Shiocton I am surprised to find a Piping Plover #315.

August 17—A trip with Mark and his son to the Wind Lake sod farms yields 8 Buff-breasted Sandpipers #316 on one of the fields. During our return to Appleton stops at Milwaukee and Horicon Marsh produce 16 different

shorebirds including 7 Red-necked Phalaropes.

August 30—Once again a call from Mark K. alerts me of an unusual bird. This time it is a Chuck-will's-widow that Jerry DeBoer has discovered singing at Paya Lake near Lakewood. Arriving before dawn I wait for the bird song to commence. A few Whip-poor-wills begin the "chorus" with the Chuck-will's-widow joining shortly thereafter. It is heard three different times, once quite close. Certainly #317 is an unexpected addition, especially at this late date.

September 28—The month has proven unusually quiet with the passerine migration being exceptionally poor. Only the shorebirds continue to provide interest. For example on the 21st three Whimbrels are at Milwaukee while Horicon Marsh has 200 Lesser Yellowlegs, a Red Knot, Western Sandpiper, White-rumped Sandpiper, 9 Baird's Sandpipers and 110 Stilt Sandpipers plus a Red-necked Phalarope.

Deciding to try for Parasitic Jaegers at Superior I endure an enjoyable but brutal 18 hour trip. The Superior-Brule area is too unique to spend such a short period of time but certain obligations dictate it being done this way. After several quiet hours at Wisconsin Point two tern like birds are seen harassing a group of gulls—Parasitics #318. While birding here I meet Larry Michael who is spending several days in the area (smart). Later this day and the ensuing two he is also able to observe the Parasitics.

October 4—Dawn finds me heading for Lake Geneva. The interest is an unusual hummingbird coming to a feeder that Mark has asked me to verify. After a short wait a small blurr appears at one of the feeders, promptly disappearing. During this brief view

enough is seen to peak my interest. Within a few minutes the bird returns, spending sufficient time to reveal that it is a male Rufous. A car phone call to Pat Parsons brings her pronto. The Rufous Hummingbird obliges by utilizing both feeders, sitting on the t.v. antenna and resting in nearby trees—#319.

October 7—A Swainson's Hawk (#320) is being harassed by crows by Appleton as I am doing errands this morning. At Horicon Marsh this afternoon there is a good number of shorebirds along Hwy 49. In a group of Dunlins is a different appearing individual. The bill shape, profile and white rump reveal it is a Curlew Sandpiper #321. While observing it, all heads suddenly come up as the birds briefly freeze. Then shorebirds are scattering in all directions as a Peregrine Falcon arrives, the one time I am not happy to see it.

October 12—An adult Lesser Black-backed Gull is leisurely watched on the Two Rivers beach.

October 13—The W.S.O. field trip to Harrington Beach is short on hawks (only a few Sharpies) but produces other noteworthy finds including Harlequin Duck, Surf Scoter and Black-throated Blue Warbler plus 13 different shorebirds at Horicon Marsh.

October 14—While cleaning my house early this morning a phone call from Tom (S.) indicates he is waiting for a probable Sabine's Gull at Fond du Lac's Lakeside Park. Promising to call back if it appears the hoped for call comes within the hour. In minutes I am racing down Hwy 41. As I pull into the parking lot Tom is pointing to the adult Sabine's feeding just off shore—#322. For the following two hours this gorgeous black, white and gray bird entertains us as it rests on the lawn and

feeds along the shore. During this time we spread the news on my car phone. Between our two lists a substantial number of birders are contacted, as my phone bill verifies. Fortunately the bird remains for several weeks.

Except for the shorebirds the remainder of October is quiet. That is until the last few days when a major cold front brings strong northwest winds. Halloween proves a treat when at Lake Drive (Ozaukee County) 12 different raptors are watched migrating along the shore including a Golden Eagle, 9 Red-shouldered Hawks and 2 Merlins.

November 2—There are still strong northwest winds so I spend part of the day in Ozaukee County. Arriving at Harrington Beach a large hawk takes flight. As it approaches, barely passing over the car, the large falcon shape with pointed wings, long tail and gray plumage proclaim it as a Gyrfalcon #323. Lake Drive hosts another good flight that includes a Goshawk, 16 Red-shouldered Hawks, 225 Red-tailed Hawks and a Merlin.

November 12—Calls from Mark K. and Kim (Risen) the previous day have informed me of an immature Pomarine Jaeger frequenting Lake Pepin. Arriving before eleven the first stop proves unproductive. In fact there is little activity at all on the lake. Fearing the worst I move north to Stockholm where at least some gulls and eagles are present. While eating my lunch in the park a dark, tern like bird is observed approaching. As it heads south it remains in view for about two minutes before being lost in the sun, sufficient to verify it as the Pomarine #324.

November 19—Calls the previous night indicate a Black Vulture, that had been seen earlier at the Cedar

Grove Ornithological Station, has reappeared. Several of us decide to meet around noon. Bob and I arrive first and after searching the general area park along the road. Some time later a large dark bird appears above the adjacent woods harassed by crows. Before it drops out of sight the short tail, black body and white wing patches indicate it is the Black Vulture #325. As the others arrive we discover its favorite perch is a telephone pole by a home near the interstate.

November 20—Mark P. calls to tell of his success in seeing the vulture plus discovering a Purple Sandpiper at Sheboygan. Because my car is in the garage for some work I am forced to make a quick afternoon trip. The Purple is found feeding amongst the rocks on Sheboygan Point—#326. It is still present on the 29th during a drive along the lakeshore.

December 2—Several of us join Bob to try and relocate the Pacific Loon he found on Big Cedar Lake the previous day. Unfortunately a two hour search fails to produce the loon, one of the few misses during the year.

December 4—Again a phone call from Mark K., this time about a Red Phalarope, finds Mark P. and me in Milwaukee this morning. A cold search by the old gun club turns up nothing but a check at the Bradford Beach parking lot reveals the phalarope feeding with ducks on the algae mat. Both of us find it hard to leave as we enjoy this delightful shorebird, #327 for me and #305 for Mark. A stop at Virmond Park on the return to Appleton affords

an excellent view of the Barrow's Goldeneye, #306 for Mark.

December 10—An afternoon check of Green Bay and Algoma finds both areas quiet. While Kewaunee has a nice group of gulls all initially prove to be Herring Gulls. However upon moving to the park located south of the harbor a Great Black-backed Gull is sighted, plus a different individual swimming among the Herrings. After studying this gull at length it becomes apparent that it is a California Gull #328. Two Glaucous Gulls and an Iceland Gull join the others before they eventually move out on the lake for the night. The remainder of the month is filled with Christmas counts and the holidays.

In retrospect this truly was a memorable year, thanks to both the birds and the birders! The remaining question is what could be a maximum number for a big year? Certainly 330–335 is probable as this year I missed a Summer Tanager and two Western Tanagers, two Scissor-tailed Flycatchers, the Pacific Loon and a Black-chinned Hummingbird. All were within 15–100 miles of home. While 340 seems almost unattainable who would have predicted reaching 314 species by mid-year, so maybe this is not as unreachable as it seems. Irregardless what is possible the fact remains if you would like a year of birding fun and excitement try a big year. After all records are made to be broken. Good luck and good birding.

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The Summer Season: 1996

by Thomas K. Soulen

The cool weather of May persisted into the first part of June. As often happens, there was frost in the north on some nights early in the month. Although temperatures reached the lower 90's from time to time as the month progressed, the heat was not oppressive until near the end of the month, when most areas of the state approached or reached the 100 degree mark. Despite these very warm days, few observers characterized June as being hot overall. July never got as warm, with maximum temperatures most weeks never reaching or barely exceeding 90°. Common adjectives describing July were "cool" or "comfortable." Many parts of the state received a great deal of rain in June. Although most areas received adequate rain in July, amounts were low enough to permit saturated soils to dry to the point that farming became much more manageable.

Those observers who commented on the weather mentioned primarily the lateness of spring migration, suggesting that it was related to the cool weather of May and early June. It is difficult to assess how good this correla-

tion is. Although a good number of both shorebird and passerine migrants lingered significantly into June, it might be difficult to say that departures this season were later than the average of most years. At the other end of the summer, the first returning shorebirds appeared pretty much on schedule, from the end of June into the first few days of July, with the first substantial migration becoming evident within the next week. No major passerine movements were obvious; a few species had shown up by mid-July, with several more being noted during the last week of the month. Rainfall amounts appear to have affected primarily waterfowl production (stated to be up this year in some areas) and shorebird habitat.

Wisconsin observers recorded a total of 265 species during the season, not far from the high of 269 of the past 15 years. The account that follows gives information on 162 of them. An additional 79 that are not mentioned were common and widespread enough to be observed in more than 25 counties. The remaining 24 species, generally noted in 10-25 counties, are listed

here along with the number of counties in which each was recorded: Pied-billed Grebe (25), Double-crested Cormorant (25), American Bittern (19), Least Bittern (14), Great Egret (13), American Black Duck (16), Northern Shoveler (12), Gadwall (12), Ring-necked Duck (13), Lesser Scaup (12), Hooded Merganser (25), Osprey (19), Virginia Rail (21), Upland Sandpiper (19), Common Snipe (23), Herring Gull (15), Great Horned Owl (25), Brown Creeper (12), Golden-winged Warbler (23), Northern Parula (10), Northern Waterthrush (11), White-throated Sparrow (22), Purple Finch (18) and Evening Grosbeak (10).

Several species stand out among the summer's rarities. The Kirtland's Warbler that turned up in Robert Spahn's Atlas block in Vilas County remained long enough to provide excitement for a number of observers. (It also provided Spahn, who lives in New York but has spent several weeks most summers for 50 years at the family cottage in Vilas Co., with his first "chance to meet some of the Wisconsin birders and put names with at least a few faces.") A Black-chinned Hummingbird was present briefly in Marathon County. Officially placed in the hypothetical category by the Records Committee, this is a first state record. Horicon Marsh yielded a brief observation of a White-faced Ibis (Wisconsin's second summer record) and numerous chances to see two Tricolored Herons. A female eider (sp.) in Door County was Wisconsin's second summer record.

Manitowoc County was the place to find quite an assortment of rarer gulls: Franklin's, Glaucous, Great Black-backed, Laughing and Little Gulls were present for varying lengths of time during the summer. Great Gray

Owls were located again, this year in Bayfield County; they have now been reported every summer since 1988 except in 1993. After not being noted since 1994, Yellow Rails were found in no less than 3 locations this season, and King Rails, not reported since 1993, appeared in 2 counties. Black-backed Woodpeckers, rarely predictable and usually elusive, were noted in no less than 7 counties. Wyalusing State Park was home this year to 2 rare warbler species, the perhaps-becoming-regular Yellow-throated and a very cooperative and vocal Prairie. American White Pelicans continued to increase in the Green Bay area. Just 2 years after their first attempted breeding there, over 150 birds were seen during the season, and 34 nests were located. Another recent breeder, the Great Black-backed Gull (successfully nesting in Wisconsin first in 1994), appeared in this same area near the end of July.

Wisconsin observers found a number of additional rarities. Others of note—some because of their being out of season—were Red-throated Loon, Horned and Eared Grebe, Snowy Egret, Little Blue Heron, Snow Goose, Harlequin Duck, Rough-legged Hawk, Spruce Grouse, American Avocet, Willet, Whimbrel, Western Sandpiper, Carolina Wren, Northern Mockingbird, White-eyed Vireo, Worm-eating Warbler, and LeConte's and Sharp-tailed Sparrow.

Fewer observers than usual commented this year on their perceptions of changes in abundance of various species. Some simply wrote comments on the backs of their forms (for example, two observers said they found almost *no* swallows in Vilas Co. this summer). Others used the numbering

system described on the front page of the single-county form. We know that such information cannot be regarded as representing an accurate picture of what may be happening to populations of Wisconsin's summer residents. However, seeing what others report in this regard might stimulate some of us to assess more critically the status of some species in our own areas. Here is Tom Schultz's suggestion for a specific project along these lines.

"This [the Henslow's Sparrow] is apparently a species which is in serious trouble in Wisconsin (based on BBS and other surveys) and it may soon be state-listed as Threatened or Endangered. I would encourage anyone with Henslow's Sparrows in their area to attempt to identify their specific breeding localities, and try to assess their continuing status."

We could say the same about other species that have been identified as possibly heading for potential trouble. Furthermore, without a great deal of difficulty, we could make very substantial additions to our knowledge of the status of such species in the state. This is an area in which amateurs can become the most valuable source of such information. Let's get busy!

Now, for the record, here is what some of you said about changes in numbers of some species this year. At least 3 observers stated that these species were more common this summer than last: Great Blue Heron, Turkey Vulture (although 3 other observers said the opposite!), Wild Turkey and Mourning Dove. The list of species said to be less common by at least 3 observers is much longer: American Black Duck, Osprey, Ruffed Grouse, Black Tern, Common Nighthawk, Chimney Swift, Ruby-throated Hummingbird,

Belted Kingfisher, Northern Flicker, Eastern Wood-Pewee, Least Flycatcher, Eastern Phoebe, Eastern Kingbird, Purple Martin, Barn Swallow, House Wren, Marsh Wren, Eastern Bluebird, Gray Catbird, Warbling Vireo, Scarlet Tanager, Rose-breasted Grosbeak, Grasshopper Sparrow, Swamp Sparrow, Western Meadowlark, Yellow-headed Blackbird, and Eastern Cowbird.

The number of this season's contributors (78) represents an all-time high. Although many individuals who usually submit records did not do so this year, there were even more who sent in reports who have done so rarely or not at all in the past, at least in summer. There also were several full time Atlasers who voluntarily filled out regular report forms in addition to managing the considerably more demanding documentation required for their multiple Atlas blocks. Their contributions to this seasonal report were both valuable and substantial. Nevertheless, there still were several counties for which no coverage was reported: Adams, Calumet, Iron, Juneau, Pierce, Racine and Wood.

REPORTS

(1 JUNE 1996–31 JULY 1996)

Red-throated Loon.—A breeding plumage bird was in Douglas Co. June 9 (Robbins).

Common Loon.—Birds were present in Jackson Co. June 1 (Ott), Milwaukee Co. June 4 (Bontly), Vernon Co. June 14 (Dankert) and Ozaukee Co. June 15 (Uttech). The remaining 16 reporting counties were considerably further north.

Horned Grebe.—Unusual was a breeding plumage bird in Door Co. July 30 (Regan).

Red-necked Grebe.—A number of observers saw birds in Green Lake Co. Also noted in Bayfield (Frank), Burnett (Frank, Tessen) and Columbia (Robbins) Counties. Ziebell found 16 nests in Winnebago Co. June 23.

Eared Grebe.—Noted in Columbia Co. July 10 (Ashman, 2 birds), Dane Co. June 18 (Burcar), and Green Lake Co. June 5 (Frank, 2 birds) and 25 (Tessen).

American White Pelican.—A number of observers saw many in the Brown/Oconto Co. area. It was just two summers ago that Wisconsin's first documented nesting occurred in this area. This summer Erdman reported 50 nests and about 30 young, with over 150 adults being present overall. Mississippi River birds were represented by observations in Buffalo and Trempealeau (Soulén) and Vernon (Dankert) Counties. Birders saw up to 17 birds in Horicon Marsh, Dodge Co. during the last week of June. Haseleu reported 20 in Washburn Co. June 2 and 47 on July 28. Sontag saw a single bird in Manitowoc Co. June 19.

Snowy Egret.—Seen in Brown Co. (Hansen, Regan, Tessen, T. Wood); Erdman reported at least 2 nests in the Green Bay area. Birds were noted through the season in Dodge Co. (Boldt, Regan, Robbins, Tessen). Sontag reported one bird in Manitowoc Co. June 6–12.

Cattle Egret.—More reports than usual. Considerable nesting occurred in the Brown/Oconto Co. area, with 25–30 pairs noted (Erdman). A number of observers saw birds in this area and also in Dodge Co. Noted in addition in these counties: Columbia July 2 (Robbins), Crawford June 5 (C. Wood), Dane July 12 (Ashman), Eau Claire July 2 (Polk), Ozaukee June 3 (Utech) and Winnebago June 18–July 9 (Bruce).

Little Blue Heron.—Appeared during July in Dodge Co. (Boldt).

Tricolored Heron.—A pair of birds treated a number of observers to excellent looks on both the Fond du Lac and Dodge Co. sides of Highway 49 in Horicon Marsh. Excellent documentation was supplied by Domagalski, Frank, Gustafson, Tessen and T. Wood, and Bartholmai submitted superb slides. See "By the Wayside."

Black-crowned Night-Heron.—Boldt found 223 nests on June 13 in Horicon Marsh,

Dodge Co. More were reported in Milwaukee than usual. Noted in 10 counties overall.

Yellow-crowned Night-Heron.—At least 3 birds were reported from Milwaukee Co. (Bontly, Korducki, Wilson). There was an immature (well described) and a pair of adults whose behavior suggested at least the possibility of nesting. C. Wood also reported a bird in Grant Co. July 8.

White-faced Ibis.—One was seen well in Horicon Marsh, Fond du Lac Co., June 15 (O'Brien, Andy Sigler). Accepted by the Records Committee. See "By the Wayside."

Tundra Swan.—There was some disagreement about the identity of a Brown Co. bird, but the consensus was that it was a Tundra Swan.

Trumpeter Swan.—A number of observers reported at least one family group at Crex Meadows, Burnett Co., a reintroduction site. Otto photographed one June 15 and 22 in Jackson Co.

Mute Swan.—This species was noted in Ashland/Bayfield, Douglas, Oconto, Portage, Washington and Waukesha Counties.

Snow Goose.—This species has been reported from Winnebago Co. in summers since 1992, as well as in some previous years. A bird was present this year from June 15 to July 12 (Nussbaum).

Canada Goose.—Sontag again reported on late migration in Manitowoc Co., from late May through mid-June. Tessen noted totals of 40 to 250 birds moving north on various days in Oconto, Outagamie, Waupaca and Winnebago Counties June 3–15.

Green-winged Teal.—The 21 counties in which observers found these were mostly eastern or northern ones.

Northern Pintail.—Reported from Dodge (Soulén, Tessen), Door (Regan) and Washburn (Cahow) Counties.

American Wigeon.—Observers found these in Brown, Burnett, Dodge, Douglas, Fond du Lac, Milwaukee, Ozaukee and Winnebago Counties.

Canvasback.—Noted in Dane, Dodge, Dunn, Oconto and Winnebago Counties.

Redhead.—Present through the season in Manitowoc Co., with an unusually high number (35) there on June 29 (Sontag). Ziebell found 60 birds and two nests in Winnebago Co. June 22–23. Noted in 9 additional counties.

Greater Scaup.—Reported from these 4 counties: Door, Douglas, Manitowoc and Milwaukee.

Eider species.—Eklblom saw and photographed a female eider in Newport State Park, Door Co. June 1, providing only the second summer record of an eider in Wisconsin. Accepted by the Records Committee.

Harlequin Duck.—A male was present in Manitowoc Co. June 10 (Sontag) through 14 (Peterson).

Common Goldeneye.—Present through June 2 in Douglas Co. (Johnson). Noted also in these counties: Vilas June 18 (Green), Manitowoc June 28–29 (Sontag), and Door July 4 and Winnebago July 8–16 (Nussbaum).

Bufflehead.—Not reported every summer, this species was present at the beginning of June in Barron Co. (Goff) and in Dane Co. June 30 (Burcar) and Oconto Co. June 15 (the Smiths).

Common Merganser.—Noted in Burnett, Door, Douglas, Forest, Portage, Shawano, Vilas and Winnebago Counties.

Red-breasted Merganser.—Observed in these counties: Ashland/Bayfield, Door, Douglas and Eau Claire.

Ruddy Duck.—Ziebell found 201 in Winnebago Co. June 22. Noted in an additional 11 counties.

Turkey Vulture.—Boldt located a nest with 2 young in Dodge Co. Observed in 48 counties overall.

Bald Eagle.—This species is being found more frequently in summer in southern counties now than previously. Reports this season came from Dane, Dodge, Grant, Green Lake, Iowa, La

Crosse, Trempealeau, Vernon and Winnebago Counties, as well as from 22 more northern ones.

Sharp-shinned Hawk.—Noted in Grant (C. Wood), Lafayette (McDaniel), Ozaukee (Uttech), Trempealeau (Warren) and Walworth (Parsons) Counties, as well as 15 more northern ones.

Northern Goshawk.—Spahn reported one from Vilas Co. June 29.

Red-shouldered Hawk.—The northernmost of this season's 15 reporting counties were Douglas (Tessen), Oneida (the Smiths) and Vilas (the Drings, the Smiths).

Broad-winged Hawk.—Reported from Dane (Burcar), Grant (Belter, Frank), Walworth (Parsons) and 19 more northern counties.

Rough-legged Hawk.—This season produced a remarkable 4 reports; only once before (1992) have there been this many. Noted in these counties: Barron (Goff), Douglas June 5 (Frank), Marathon June 9 (Tessen) and Price July 4 (Soulén).

Merlin.—This season's reports came from Ashland/Bayfield, Door, Douglas and Vilas Counties.

Peregrine Falcon.—A nest in Brown Co. produced 4 young. A number of observers saw birds in Milwaukee, a reintroduction site. Also noted in Marathon Co. July 12 (Ott) and Sheboygan Co. July 10 (the Brassers).

Gray Partridge.—Noted through the season in Brown Co. (Hansen) and in Grant Co. June 9 (C. Wood) and Vernon Co. June 2 (Dankert, Leshner).

Spruce Grouse.—A cooperative hen and her young were seen several times along old County A in the Three Lakes bog, Oneida Co. July 4–6 (Domagalski, Gustafson). Spahn and Tessen each reported birds in Vilas Co. July 2.

Ruffed Grouse.—There was representation from most parts of the state except the southeast among the 32 counties from which this species was reported.

Greater Prairie-Chicken.—Leshner saw one bird at close range at Crex Meadows, Burnett Co. June 17. Reported also from Clark Co. (Decker).

Sharp-tailed Grouse.—Noted by multiple observers in Burnett and Douglas Counties.

Wild Turkey.—Observed in no less than 31 counties this season, nearly double the number in which it was noted the past few years. Our previous summer high was 19 counties, in 1992.

Northern Bobwhite.—Among this season's 17 reporting counties, Kewaunee (Regan, July 23) and Oconto (the Smiths, July 16–17) seem quite out of normal range.

Yellow Rail.—After 4 years of no summer reports, observers found this species in several locations: Burnett Co. June 6–9 (Peterson, Schultz), Marquette Co. at least until July 26 (Schultz, Tessen, Bill Brooks), and Vilas Co. June 2 (T. Wood). Several to 6 or more birds were heard in each location.

King Rail.—The only reports of this seemingly ever more difficult to find species came from Dodge Co. June 14 (Gustafson) and Winnebago Co. June 22 (Tessen).

Common Moorhen.—Noted in Brown, Columbia, Dane, Dodge, Waukesha and Winnebago Counties.

American Coot.—Ziebell found over 200 birds and 24 nests in Winnebago Co. June 22–23. Also nested in Dodge Co. (Boldt). Recorded in 19 counties overall.

Black-bellied Plover.—A bird in Ozaukee Co. July 11 was very unexpected (Uttech).

American Golden Plover.—This species was also represented by a lone, out of season bird seen July 8–9 in Dane Co. (Burcar, Robbins).

Semipalmated Plover.—Returning birds appeared in Dane Co. July 15 (Ashman), Door (Regan) and Ozaukee (Uttech) Counties July 16 and Dodge Co. July 20 (Boldt). Fewer reports than usual.

American Avocet.—Gustafson saw one swimming in Lake Michigan in Milwaukee Co. June 4, and Korducki reported 2 birds there July 2. Also noted in Dane Co. July 2 (Ashman), Eau Claire Co. June 14 (Polk) and Manitowoc Co. June 14/July 7 (Peterson, Sontag).

Greater Yellowlegs.—The first returning birds were reported from Columbia Co. July 8 (Burcar) and Dodge Co. July 9 (Domagalski), with birds appearing in several other locations in the next few days.

Lesser Yellowlegs.—Lingered until June 2 in Dane Co. (Ashman) and June 3 in Eau Claire Co. (Polk). It's difficult to know how to classify birds present June 20 in Marinette Co. (Regan) and June 28 in Dodge Co. (Domagalski), but they may well have been very early fall migrants. More definite fall migrants were noted in Columbia and Dodge (Robbins) and Eau Claire Counties July 2 (Polk), with others appearing in several other counties within the next week.

Solitary Sandpiper.—A bird in Winnebago Co. June 13 was most unusual (Bruce). Parsons noted the first fall migrant in Walworth Co. June 30. Other birds appeared in Dane, Dodge and Columbia Counties July 2–4 (Burcar, Frank, Robbins). Further migrants were not seen in other areas until nearly a week later.

Willet.—Single birds were in Dane Co. July 12 (Ashman) and Milwaukee Co. July 21 (Korducki).

Whimbrel.—A bird on Wisconsin Point, Douglas Co., June 8 provided a treat for a number of people at the Superior convention (Peterson, Soulen, Tessen).

Ruddy Turnstone.—Lingered until June 20 in Manitowoc Co. (Sontag). The only fall migrants reported were in Winnebago Co. July 29 (Bruce).

Sanderling.—Present in Douglas Co. June 8–9 (Frank, Soulen, Tessen). Had returned to Dane (Ashman) and Kewaunee (Regan) Counties by July 19, with no further sightings until the end of the month.

Semipalmated Sandpiper.—Birds in Douglas Co. June 8 were the latest stragglers reported (Soulen, Tessen). The first returning birds appeared July 7 in Manitowoc Co. (Sontag)

and July 9 in Brown (Tessen) and Fond du Lac (Schultz) Counties.

Western Sandpiper.—The season's only report came from Fond du Lac Co. June 5 (Tessen).

Least Sandpiper.—The latest spring migrants were seen June 2 in Dane Co. (Ashman) and June 3 in Ozaukee Co. (Uttech). Birds reappeared in Dane Co. July 2 (Ashman) and in 5 additional counties by July 9.

White-rumped Sandpiper.—Remained until June 3 in Ozaukee Co. (Uttech), June 5 in Fond du Lac Co. (Tessen) and June 12 in Milwaukee Co. (Gustafson). The only other reports were of returning birds: Dane Co. July 9 and 27 and Dodge Co. July 29 (Robbins).

Baird's Sandpiper.—Spring stragglers were noted in Milwaukee Co. June 2 (Korducki, 6 birds), Dane Co. until June 4 (Robbins) and Fond du Lac Co. June 10 (Tessen). Fall migrants were in Dodge Co. July 13 (Tessen) and July 28 (Boldt) and in Oconto Co. July 27 (the Smiths).

Pectoral Sandpiper.—Still present June 2 in Dane Co. (Ashman). Was a June 13 bird in Oconto Co. (the Smiths) late or early? The earliest obvious fall migrants appeared in Dodge Co. July 1 (Domagalski) and Columbia Co. July 8 (Burcar).

Dunlin.—Sontag saw 2 birds until June 15 and after July 12 in Manitowoc Co. and says that others reported seeing the birds between those dates. Other reports came from Ozaukee Co. June 1 (Uttech), Douglas Co. June 2 (Johnson) and Fond du Lac Co. June 10 (Tessen).

Stilt Sandpiper.—Had appeared in Dodge and Fond du Lac Counties by July 13 (Tessen) and Dane Co. by July 15 (Ashman). Several observers noted considerable numbers (35 to more than 50) in Horicon Marsh by the end of July.

Short(?)-billed Dowitcher.—Only one of this season's 15 reports of dowitchers was documented. Although it is generally assumed that the earliest fall migrants are of this species, and in fact that Long-billeds do not appear—at least in any numbers—until considerably later, we have woefully little information that lets us document with some confidence the migration patterns of the two species. It would be most helpful

if observers mentioned—even briefly—the basis for their identifications, whether it be call notes or plumage characteristics or both. Returning birds stated to be this species were noted in Dodge Co. July 4 (Frank) and in 5 other counties July 7–10.

Long-billed Dowitcher.—Remained until June 7 in Ozaukee Co. and reappeared there by July 18 (Uttech). One was also reported from Fond du Lac Co. July 29 (Tessen).

Wilson's Phalarope.—Noted by several observers through the season in Dodge Co., although there was no evidence of breeding. June reports came from Oconto and Winnebago Counties, and birds were noted in July in 3 additional counties.

Red-necked Phalarope.—Observed in Dane Co. July 12 (Robbins) and Dodge Co. July 28–29 (Belter, Tessen).

Laughing Gull.—Reported from Manitowoc Co. July 3–21 (Sontag, Tessen, T. Wood).

Franklin's Gull.—This species was observed in these counties: Dane July 12–28 (Ashman), Manitowoc throughout the period (Belter, Sontag, Tessen), Kewaunee June 4 (Regan), and Milwaukee during July (Diehl, Domagalski, Korducki).

Little Gull.—Noted in Manitowoc Co. June 26–July 22, with a maximum of 3 birds (Sontag). Up to 3 birds were also observed near Pensaukee, Oconto Co. from mid–July on (Erdman, the Smiths).

Bonaparte's Gull.—Unusually large numbers were in Manitowoc Co. this season, with a maximum of 1500 on July 2 (Sontag). Also reported from Douglas Co. until June 2 (Johnson), Dunn Co. July 28 (Gamache), and Milwaukee, Oconto, Ozaukee and Sheboygan Counties through much of the season.

Glaucous Gull.—A bird was present all summer in Manitowoc Co. (Sontag). One also appeared in Winnebago Co. June 22 (Ziebell).

Great Black-backed Gull.—Birds were seen June 9 in Douglas Co. (Tessen) and through June 21 in Manitowoc Co. (Sontag). Wisconsin's first breeding record of this species

occurred in 1994, in Door Co. Although there was no evidence of breeding this year, it is possible that birds that appeared at the end of July in Door Co. (Regan) and Brown Co. (Erdman, Hansen, the Smiths) might have bred not too far away.

Caspian Tern.—Except for reports from Dane Co. from July 2 on (Ashman), Dodge Co. through the season (Domagalski), and Winnebago Co. through July 17 (Ziebell), all other observations came from counties bordering Lake Michigan or Lake Superior.

Common Tern.—In addition to expected reports from counties bordering Lake Michigan or Lake Superior, this species was noted in Winnebago Co. June 3–July 25 (Bruce) and, surprisingly, in Washburn Co. (Cahow).

Forster's Tern.—Noted in Dane, Dodge, Dunn, Fond du Lac, Green Lake, Manitowoc, Milwaukee, Oconto, Washington and Winnebago Counties.

Yellow-billed Cuckoo.—Of the 21 counties reporting this species, these were the most northern: Burnett (T. Wood), Douglas (the LaValleys) and Florence (Strelka).

Eastern Screech-Owl.—Found in these counties: Chippewa, Clark, Crawford, Dane, Dodge, Dunn, Eau Claire, Grant, Milwaukee and Winnebago.

Great Gray Owl.—A bird was seen and photographed at close range near Cornucopia in Bayfield Co. July 9 (Radeloff). Two birds were seen and photographed near there in mid-July by Walters and a number of co-workers and visitors to the Apostle Islands National Lakeshore. One was about 5–6 miles east of the Cornucopia bird on July 14 and was killed by a passing car shortly after their observation. A second was seen July 21 near Little Sand Bay several miles still further east. See "By the Wayside."

Northern Saw-whet Owl.—Reported from Douglas Co. June 4 (Johnson) and June 8 (Tessen).

Black-chinned Hummingbird.—A bird seen July 28 in Marathon Co. was accepted as a hypothetical record by the Records Committee (Roger Betts, Ott). See "By the Wayside."

Red-bellied Woodpecker.—Northernmost among the 38 counties in which this species was found were Barron (Goff), Burnett (Cahow), Marathon (Ott), Oconto (the Smiths) and Shawano (Peterson).

Black-backed Woodpecker.—Birds were located in these counties: Ashland June 5 (Harriman), Burnett July 23 (Cahow), Douglas June 4–8 (Johnson, Tessen), Forest June 22 (Reardon) and July 2 (Tessen), Oneida July 4 (Gustafson), Vilas July 2–5 (Spahn) and Washburn July 2 (Cahow).

Olive-sided Flycatcher.—Birds remained in 6 southern and central counties into June, latest in Grant Co. June 6 (C. Wood) and Vernon Co. June 8 (Dankert). Other observations were within normal range.

Yellow-bellied Flycatcher.—This species lingered even later than the preceding in southern counties; observations in Manitowoc Co. June 11 and Milwaukee Co. June 16 were the latest. Present in Portage Co. through July 1 (Berner, 3 birds) and also in 5 northern counties.

Acadian Flycatcher.—Somewhat out of normal range were a singing male in Marathon Co. through July 11 (Berner), a pair that attempted nesting in Portage Co. (Berner), and 3 pairs in Dunn Co. through most of the season (Gamache, Polk). Also noted in 13 much more southern counties.

Alder Flycatcher.—The most southern of the 32 counties in which observers found this species after the middle of June were Dane, Dodge, Milwaukee, Walworth and Washington.

Willow Flycatcher.—Observations of this species in Douglas (Johnson) and Vilas (the Drings) Counties were decidedly outside of normal range. Noted in 40 counties overall.

Gray Jay.—Reported by multiple observers in Douglas, Forest, Oneida and Vilas Counties and also in Price Co. (Hardy).

Common Raven.—Most southern among the 26 reporting counties were Jackson (Otto), Outagamie (Nussbaum, Tessen), Portage (Berner) and Waupaca (Tessen).

Boreal Chickadee.—Noted in Vilas Co. July 4–8, including a family group with 4 young (Gustafson, Spahn). Also reported from Oneida Co. July 2 (Tessen).

Tufted Titmouse.—This species was observed in these counties: Chippewa, Crawford, Dane, Dunn, Eau Claire, Grant, Iowa, Jefferson, La Crosse and Vernon.

Red-breasted Nuthatch.—Among the 26 counties in which observers found these, the most southern were Dane, Green Lake, Jackson, Milwaukee, Outagamie, Pepin and Winnebago.

Carolina Wren.—The summer's only reports came from Grant Co. June 24 (C. Wood) and Waukesha Co. July 7 (T. Wood).

Winter Wren.—Noted in Grant, Portage, Sauk, Waupaca and 18 more northern counties.

Marsh Wren.—Ziebell counted 290 in Winnebago Co. June 22. Observed in 35 counties overall.

Golden-crowned Kinglet.—At least 5 birds were again present in the Dewey Marsh bog, Portage Co. (Berner). Other reports came from Douglas, Florence, Forest, Oneida and Vilas Counties.

Ruby-crowned Kinglet.—Noted in Ashland/Bayfield, Douglas, Vilas and Washburn Counties.

Blue-gray Gnatcatcher.—Northernmost among the 31 reporting counties were Oconto (the Smiths) and Washburn (Cahow).

Veery.—The most southern counties among the 34 reporting this species were Grant (Dankert), Rock (Soulen) and Walworth (Gutschow).

Gray-cheeked Thrush.—Present in early June in Barron (Goff) and Washburn (Haseleu) Counties.

Swainson's Thrush.—Lingered into June in Douglas (Johnson), Milwaukee (Bontly), Washburn (Cahow) and Winnebago (Bruce) Counties. Had reappeared in Douglas Co. by July 25 (the LaValleys). Found in early July within range in Vilas Co. (Mead)

Hermit Thrush.—Noted in Jackson Co. (Otto), Waushara Co. June 10 (Harriman), and 18 more northern counties.

Northern Mockingbird.—Reported from Burnett Co. June 4 (T. Wood), Milwaukee Co. June 13 (Wilson) and Oconto Co. June 5 (the Smiths).

American Pipit.—A bird was still present in Douglas Co. June 1 (Johnson).

Loggerhead Shrike.—Nested in Shawano Co. (Jason Swelstad, Mead). Also reported from Barron (Goff), Green (Tessen) and Walworth (Parsons) Counties.

White-eyed Vireo.—Noted in Governor Dodge State Park, Iowa Co., between June 27 (Soulen) and July 3 (Burcar).

Bell's Vireo.—A bird in Shawano Co. June 3 was far out of range (Peterson). Seen and heard by a number of observers in Wyalusing State Park, Grant Co.; at least 5 pairs were present (C. Wood). Dankert found 6 in La Crosse Co. June 27. Also noted in Buffalo (Warren), Dodge (Boldt), Dunn (Gamache), Iowa (Ashman, Burcar, Robbins, Soulen) and Vernon (Dankert) Counties.

Solitary Vireo.—Nested in Waukesha Co., where it has been present in some previous summers (John Bielefeldt fide Morett). Lingered in Milwaukee Co. until June 4 (Bontly). Berner found 3 singing males in Jackson Co. July 4 and one in Portage Co. July 7. Other reports came from 9 more northern counties.

Yellow-throated Vireo.—Most northern of the reporting counties were Douglas, Marinette, Oconto, Vilas and Washburn.

Philadelphia Vireo.—One remained in Manitowoc Co. until June 10 (Sontag).

Brewster's/Lawrence's hybrids.—Berner found 2 male Brewster's Warblers in Portage Co. June 12, one singing a Blue-winged song. A male Lawrence's (also singing a Blue-winged song) nested with a female Blue-winged in Portage Co. (Berner). A second Lawrence's male, this one paired with a female Golden-winged, was observed in Dunn Co. (Bob Heagle fide Polk).

Blue-winged Warbler.—Northernmost of the 27 reporting counties were Sawyer (Polk) and Shawano (Peterson).

Tennessee Warbler.—Lingered until June 7 in Douglas Co. (Tessen), June 8 in Grant Co. (C. Wood) and June 10 in Milwaukee Co. (Zehner). Fall migrants had reached Portage Co. by July 17 (Berner) and Milwaukee Co. by July 31 (Diehl).

Nashville Warbler.—Birds in Ozaukee Co. June 12 (Frank), Milwaukee Co. June 20 (Bontly) and La Crosse Co. June 26 (Dankert) were very unusual. Reported from 22 additional counties.

Magnolia Warbler.—Still in Ozaukee Co. June 1 (Uttech) and Milwaukee Co. June 5 (Bontly, Korducki). A persistently singing male (discovered by C. Wood) near headquarters in Wyalusing Park, Grant Co. was seen or heard by several observers at least through July 3. Noted in 10 additional counties within normal range.

Cape May Warbler.—A straggler was in Milwaukee Co. June 2 (Korducki). Noted in Douglas Co. June 6–25 (Frank, Tessen, Johnson).

Black-throated Blue Warbler.—Reported from Ashland/Bayfield (Verch), Door (Nussbaum), Forest (Robbins, Spahn, Tessen), Shawano (Peterson) and Vilas (Belter, the Drings, Spahn) Counties.

Yellow-rumped Warbler.—Still in Milwaukee Co. June 2 (Korducki). A bird in Winnebago Co. June 15 was unusual (Nussbaum). One in Trempealeau Co. July 21 was even more unusual (Warren); this would be an extremely early migration date for this species. Noted in 19 additional counties within normal range.

Black-throated Green Warbler.—Very late stragglers were in Milwaukee Co. June 12 (Bontly, Gustafson) and Walworth Co. June 14 (Gutschow). Present during in the season in Waukesha Co., where it has spent some previous summers (John Bielefeldt fide Morett). The remaining 15 reporting counties were within normal range.

Blackburnian Warbler.—Normally a few of these linger later than other warbler species. This year's stragglers remained until June 5 in Washington Co. (Diehl), June 10 in Milwaukee Co. (Gutschow) and June 20 in Manitowoc Co.

(Sontag). Other reports came from 15 additional counties within normal range.

Yellow-throated Warbler.—Again located by several observers in Wyalusing Park, Grant Co. C. Wood found one singing male at the beginning of the season and 2 additional ones in mid-July; all were very territorial.

Pine Warbler.—Found again in Waukesha Co. (John Bielefeldt fide Morett). The other 19 reporting counties were much further north.

Kirtland's Warbler.—Spahn's exciting find of this species in his Atlas block in Vilas Co. June 30 provided a rare treat for a number of observers. The Records Committee accepted documentation provided by Gustafson, Korducki, Schultz, Soulen, Spahn and Tessen. The bird was reported for at least a week and may have remained in the area for almost 2 weeks. See "By the Wayside."

Prairie Warbler.—Another cooperative rarity, this frequently singing male remained along the entrance road to Wyalusing Park, Grant Co. until mid-July (C. Wood) and was seen and heard by a number of observers.

Palm Warbler.—Present again in the Dewey Marsh bog, Portage Co., at least until July 1 (Berner, 2 birds). Also reported by multiple observers from Douglas, Oneida and Vilas Counties.

Bay-breasted Warbler.—Late migrants were noted in Portage Co. June 4 (Berner), Douglas Co. June 7 (Tessen) and Milwaukee Co. June 11 (Bontly). Also reported from Washburn Co. (Cahow).

Blackpoll Warbler.—Lingered until June 3 in Milwaukee Co. (Gustafson) and June 7 in Douglas Co. (Frank, Tessen).

Cerulean Warbler.—Cahow reported this species from Atlas blocks in both Burnett and Washburn Counties. Also noted by Frank in Burnett Co. June 7 and on the Nicolet National Forest Bird Survey (fide Bob Howe). The remaining observations were in 12 more southern counties.

Black-and-white Warbler.—This species summers sparingly in southern counties, so it is difficult to know whether these reports are of mi-

grants or residents: Milwaukee (Gutschow) and Washington (Diehl) Counties June 10, Grant Co. June 17 (Frank), and La Crosse Co. July 22 (Dankert). The other 26 reporting counties were well within normal range.

Prothonotary Warbler.—Birds in Jackson Co. June 26 and July 26 were unusual (Dankert). Noted in 10 additional counties.

Worm-eating Warbler.—A bird was present until June 30 in the Brooklyn Wildlife Area in Dane Co. (Ashman). Also noted in Sauk Co. in early June (Burcar).

Louisiana Waterthrush.—A bird in Marinette Co. June 15 was very unusual (Noel Cutright fide Harriman). Also reported from Dane, Dunn, Grant, Ozaukee, Polk and Sauk Counties.

Kentucky Warbler.—Grant Co. provided the most reports, as usual. Atlas work resulted in a confirmed nesting (Dankert, adult feeding a fledged bird) and observations of over 40 pairs in the county overall (C. Wood). Also noted in Iowa Co. June 16 (Burcar) and June 27 (Soulen).

Connecticut Warbler.—Still present in Grant Co. June 1 (C. Wood) and Milwaukee Co. June 4 (Gutschow). Jackson Co. again provided the season's southernmost location for resident birds (Berner, July 4), with other observations coming from Ashland/Bayfield, Burnett, Douglas, Vilas and Washburn Counties.

Mourning Warbler.—A pair was present in Grant Co. (C. Wood). Also reported from Buffalo, Dane, Dodge, La Crosse, Milwaukee, Ozaukee, Walworth, Washington and 27 more northern counties.

Hooded Warbler.—Present through the season in Dane (Ashman) and Waukesha (Domagalski) Counties. Also noted in Eau Claire (Lohre), Fond du Lac (Tessen), Green (Tessen), Milwaukee (Bontly), Monroe (Dankert), Sheboygan (Peterson, T. Wood) and Walworth (T. Wood) Counties.

Wilson's Warbler.—Lingered until June 7 in Douglas Co. (Frank, Tessen), June 8 in Grant Co. (C. Wood) and June 9 in Milwaukee Co. (Wilson). Also noted on the Nicolet National Forest Bird Survey in early June (fide Bob Howe).

Canada Warbler.—Still present in Washington (Domagalski) and Ozaukee (Frank) Counties June 2. Birds sometimes are seen quite late in Milwaukee Co., but this year's June 25 report is one of the latest ever from this area (Kordecki). Noted in 15 additional counties.

Yellow-breasted Chat.—Up to 2 birds were present in Dane Co. through July 15 (Ashman, Peterson). Noted also in Walworth Co. June 23 (Frank).

Northern Cardinal.—Among the 49 reporting counties, the most northern were Ashland/Bayfield (Verch), Forest (the Smiths), Oneida (Schipper), Price (Hardy) and Washburn (Cahow).

Dickcissel.—If there were such a thing as an average season for this species, this season probably would be at or slightly below that level. The number of counties reporting (30) was higher than some years, but few observers commented on high numbers of birds (although Diehl found over 40 in Washington Co. on July 13), and birds reached only as far north as Burnett (Haseleu), Shawano (Peterson) and Washburn (Cahow) Counties.

Field Sparrow.—Among the 47 counties in which this species was found, the most northern were Douglas, Florence and Oneida.

Lark Sparrow.—Noted in Chippewa, Dunn and Eau Claire (Polk), Grant (Dankert), La Crosse (Dankert, Leshner), Iowa (Ashman) and Sauk (Burcar, Robbins, Soulen) Counties.

Grasshopper Sparrow.—Reported from Burnett (Cahow), Marathon (Ott), Oconto (Tessen) and 26 more southern counties.

Henslow's Sparrow.—Reported from no less than 12 counties this season: Dane, Dodge, Dunn, Eau Claire, Fond du Lac, Green Lake (over 30 singing males, Schultz), Iowa, La Crosse, Manitowoc, Portage, Richland and Sauk.

LeConte's Sparrow.—A number of observers found this species in Burnett and Oneida Counties. Also noted in Douglas (Johnson, the LaValleys), Dunn (Polk), Green Lake (Schultz, C. Wood), Oconto (the Smiths) and Vilas (T. Wood) Counties.

Sharp-tailed Sparrow.—Reported from Crex Meadows, Burnett Co., from early June through July 10 (Peterson, Soulen, Tessen, T. Wood).

Lincoln's Sparrow.—Berner reported as many as 5 in the Dewey Marsh bog, Portage Co., through July 1. Spahn counted over 75 in Vilas Co. July 7. Also noted in Douglas, Forest and Oneida Counties.

Dark-eyed Junco.—Present in Ashland/Bayfield, Douglas, Forest, Oneida and Vilas Counties.

Yellow-headed Blackbird.—Ziebell counted 580 and located 24 nests in Winnebago Co. June 22–23. Reported from 20 counties overall.

Orchard Oriole.—This species was noted in no less than 18 counties: Brown, Columbia, Crawford, Dane, Dodge, Dunn, Eau Claire, Grant, Iowa, La Crosse, Monroe, Oconto, Ozaukee, Sauk, Shawano, Vernon, Walworth and Washington.

House Finch.—Observers reported this species from 55 counties this season.

Red Crossbill.—This irregular species was not numerous this season, but it was widespread enough to be noted in these 12 counties: Bayfield, Burnett, Chippewa, Douglas, Dunn, Milwaukee, Oneida, Outagamie, Portage, St. Croix, Vilas and Winnebago.

White-winged Crossbill.—Reported from Forest (Reardon, Spahn), Oneida (Domagalski, Soulen, Tessen) and especially Vilas (Belter, Gustafson, Robbins, Soulen, Spahn) Counties.

Pine Siskin.—Birds had left most of the 22 reporting counties—some as far south as Dane, Grant, Milwaukee and Walworth—by mid-June, but some remained into July in Barron, Florence, Langlade, Portage, Oneida, Price and Vilas.

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“By the Wayside”

Interesting observations document Snowy Owl preying on Ring-necked Pheasant and American Crows eating sand.

SNOWY OWL PREDATION ON RING-NECKED PHEASANT

4 December 1996, Burnett County—Jim Hoefler and I had just exited the east gate of the Crex Meadows Wildlife Area refuge when we spotted a Snowy Owl flying past. The owl landed on the edge of Main Dike road a hundred meters to the east of our truck. After securing the refuge gate we headed toward the spot where the owl had landed.

As we approached the Snowy Owl flushed from the side of the dike carrying a large prey item. To me it looked like a small Sharptail Grouse or possibly a hen Ring-necked Pheasant. On examining the kill site we found fresh blood in the snow and a handful of feathers.

From the feathers we determined the prey was indeed a pheasant. Crex contains good numbers of sharptails and the occasional pheasant. The south side of dikes are attractive areas for these birds in the winter but in this case it proved fatal for the individual. For the snowy it was a good meal as I am sure it takes a lot of voles to equal one pheasant.

The owl had landed out on the ice of Dike One Flowage north of road. We

continued to watch the bird for several more minutes as it started to pluck and eat its meal.—*Steve Hoffman, Crex Meadows Wildlife Area, P.O. Box 367, Grantsburg, WI 54840*

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 to 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 1996, 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 bill-full 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 (1946) 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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“By the Wayside”

Rare observations documenting sightings of Tricolored Heron, White-faced Ibis, Rough-legged Hawk, Laughing Gull, Great Gray Owl, Black-chinned Hummingbird, Kirtland's Warbler.

TRICOLORED HERON (*Egretta tricolor*)

12 June 1996, Horicon Marsh, Fond du Lac County—A medium sized heron that was significantly smaller than a Great Egret and only half the size of a Great Blue Heron. The heron was feeding in the shallow water of a canal, where I saw it catch and eat a frog. The body was dark blue-gray with the head and neck a slightly darker tone than the wings and upper back. The lower back was tan. Contrasting with the general dark color of the bird was a bright white plume on the back side of the head. Also, the under side of the heron was white as was a thin line along the front side of the neck. This white front of the neck was separated from the white underbelly by a dense gathering of dark feathers that extended across the base of the neck. The bill was quite long for the size of the heron. The bill was also slender, ending in a sharp point. The bill, at least at the base, had a dull yellow tone. The legs were a dingy yellow green.—*Robert C. Domagalski, Menomonee Falls.*

26 July 1996, Horicon Marsh, Fond du Lac County—The bird was at the edge of a ditch along STH 49 about .25 miles

east of the historical marker and approximately 100 yards north of the road. I observed the long slender bill which was blue-gray with a black tip, and the blue-gray neck with a maroon patch on the nape from which short white plumes extended rearward.

The breast was also maroon, the belly white, and the upper back grayish with creamy feathers streaming over the lower back. The wings were a shade of blue, and the eye yellowish. At certain angles, a patch of buff could be seen on the throat, otherwise the throat was white with a few maroon feathers interspersed. This bird stayed in the same area for at least one hour, moving only slightly when some Great Egrets and Great Blue Herons flew in. The Tricolored Heron was much smaller than both of these species. The observation was made from my vehicle with a zoom spotting scope.—*Thomas C. Wood, Menomonee Falls.*

WHITE-FACED IBIS (*Plegadis chihi*)

15 June 1996, Horicon Marsh, Fond du Lac County—On Saturday, June 15, Andy Sigler and I were birding at Horicon Marsh in search of two Tricolored Herons that had been reported there

earlier in the week. We had not seen the herons and so remained at the shallow pond north of Rt. 49 at the Historic Marker sign from 5:30 P.M. until nearly 8:00 P.M. Sometime between 6:30 and 6:45 P.M., Andy found an ibis flying in toward the pond and alerted me to its presence. It landed in the middle of the large mudflat on the east side of the pond and fed there for about five minutes before flying away to the north. Our views were with a Kowa telescope at 40–50 $\times$, and a Qwestar at 60 $\times$ from the side of Rt. 49.

The bird was a medium-sized dark wader that was identified as an ibis by its long, decurved, black bill, medium length neck, stiff flight with down-bowed wingtips, and glossy plumage. Several features identified it as a White-faced Ibis. First, the legs were entirely pinkish, a breeding plumage feature of white-faced ibis. Glossy Ibis in a similar plumage still retain black legs. Second, the head, neck, and body plumage were bright and uniformly bronze-colored. The wings were contrastingly dark glossy greenish, and appeared black at most angles. Third, there was a distinct rim of white feathers surrounding the dark facial skin. This clearly extended over the top of the bill and behind the eye. While it is sometimes difficult to distinguish between the bluish facial skin of a Glossy Ibis and the white feathering of a White-faced, I feel quite confident that the features we saw were feathering. The uniform width of the white area and the fact that it went over the bill and behind the eye rule out facial skin. At some times, it seemed that it was possible to see a red eye. I was never entirely sure of this, due to distance, but Andy felt pretty confident of it. In sum, I feel that the field marks observed

were more than adequate to identify this as a White-faced Ibis.—*John O'Brien, Chicago, IL.*

ROUGH-LEGGED HAWK

(*Buteo lagopus*)

4 July 1996, eastern Price County—

Marillyn and I were traveling east on U.S. Highway 8 in Price Co. on July 4, about a mile from Oneida Co., when we spotted a large, hovering buteo ahead of the car. Initially its angle was such that all we could see was its hovering behavior. I assumed that the bird was a Red-tailed Hawk, since this would be the most likely species at this season, and they occasionally hover. As we got closer and somewhat underneath the bird, however, we were treated to a wonderful look at a classic Rough-legged Hawk, with a black belly, prominent wrist marks, and a white tail with a very marked broad dark terminal band.—*Tom Soulen, St. Paul, MN.*

LAUGHING GULL (*Larus atricilla*)

21 July 1996, Manitowoc impoundment, Manitowoc County—I was fortunate to see Bonaparte's, Franklin's, a Laughing Gull, and Ring-billed Gulls in proximity for direct comparison.

One Franklin's (of 3–4) in the area stood side-by-side with the Laughing Gull. The Franklin's Gull was noticeably larger than the Bonaparte's Gulls, and about 20% smaller than the Laughing Gull. The Laughing Gull was smaller than nearby Ring-billed Gulls. The Franklin's Gull was immature, having an incompletely darkened hood, but it was more complete than that of the Laughing Gull, which had only a dingy black band across the back of the head. Both birds had broken, but thick

eyerings. The Franklin's had a nicely rounded head, and the Laughing Gull's crown had a flatter appearance with a more sloping forehead. The Franklin's bill was short, thin, and straight, appearing delicate in comparison to the Laughing Gull's longer, thicker bill which drooped at the tip. Leg and bill color appeared blackish on both species. The Franklin's Gull had white spots on the primaries—the Laughing Gull's primaries were unmarked black. The tail of the Laughing Gull was seen during preening and was a clean white, probably indicative of a second year bird. Back plumage was much darker gray on both birds than on Bonaparte's and Ring-billed Gulls. I judged the Franklin's plumage to be a brighter gray than that of the Laughing Gull.—*Thomas C. Wood, Menomonee Falls.*

GREAT GRAY OWL (*Strix nebulosa*)

14 and 21 July 1996, Bayfield County—I had been hearing reports of a Great Gray Owl by coworkers at Apostle Islands National Lakeshore for about one week when, after a report from a visitor, I decided to finally go look for the bird on Sunday, July 14. My housemate and I proceeded toward the Sand River west of County Road K in Bayfield County on Hwy 13 in the late afternoon, about 6 P.M., when we saw the bird about 1/2 mile east of the Sand River on a road sign on the south side of the road. We observed the bird from across the highway for about 30 minutes when it flew east along the road about 1/10 mile. We observed it there for a few more minutes then decided to leave. A few hours later, another Park Ranger, Tom Hoffman, found the bird dead on the road. It had been hit

by a car. The carcass is in possession of Apostle Islands National Lakeshore.

One week later, on July 21, again prompted by a visitor sighting, I looked for another individual on Little Sand Bay Road off County K, about 1/4 mile south of the National Park Service ranger station and visitor center at Little Sand Bay. The report was of a sighting on the corner of Little Sand Bay and Allen Roads, and I saw the bird sitting on a 25 mph sign about 100 feet from the National Park Service boundary. I left and returned 5 minutes later (approx. 6:45 P.M.) with 5 other observers, ranger Ann Lundberg, Student Conservation Association resource assistant Leslie Noa (who also saw the July 14 individual), and 3 guests. We observed and photographed the bird for about 25 minutes, during which time we were joined by 3 park visitors. The bird flew from the 25 mph sign to a tree on the east side of the road, then flew into the woods beyond. The bird was seen again on Allen Road by Ann Lundberg as she was running on August 4. Both birds were obviously Great Gray Owls. They had yellow eyes, prominent facial disks, and were very large in size. White mottling and black chin markings were also obvious. Behaviorally, the birds displayed typical Great Gray Owl tolerance of being observed. Neither bird flew far away from its original position.—*Catherin Walters, Ashland.*

BLACK-CHINNED HUMMINGBIRD (*Archilochus alexandri*)

28 July 1996, Marathon County—It (He) looked very similar to a Ruby-throated Hummingbird while sitting on the feeder (in the shade) except for a noticeable white band around its

neck. Also it seemed to be slightly more slender than a Ruby-throated. It (He) flew backwards a few inches into the sunlight and at that point the sun hit his throat and it was black with a violet bottom edge. He was very nervous and did not like approaching the feeder when anyone was moving inside the house or outside. He also was easily fought off by the Ruby-throated males. During the confrontations there was loud chattering but nothing I could describe. When in the sunlight the black area was a matte black even when tilting at different angles.—*Lynn Ott, Wausau.*

(Editor's note: This hummingbird record has been added to the Wisconsin list in the hypothetical category by the Records Committee.)

KIRTLAND'S WARBLER (*Dendroica kirtlandii*)

30 June 1996, Stormy Lake, CE Atlas block, Vilas County—The bird which immediately responded to my spishing was a largish warbler moving relatively high in the jack pines with lots of tail wagging. It was bright yellow underneath from chin and throat to upper belly, white on lower belly and undertail coverts, with heavy black streaks on the sides of the breast and bluish gray upper parts. ID was immediate and obvious, and I was a bit chagrined at not placing the song right away, though I've only stopped for them three times—Mio in 1978, and Grayling in 1989 and 1994—in the past.

With a bit more, softer, spishing, the bird dropped to eye level and approached at times to within 20 ft, periodically stopping to sing. I was easily able to note the white wing bars (narrow) and the horizontally split, promi-

nent white eyering on a basically dark face.

Having left my camera at the cottage, I recalled my tape recorder with an old 30 sec. Screech Owl (for Big Day and CBC's at home) still in place and pulled it out, spished the bird back close, and recorded three songs.

The bird was present until at least 7/7, seen by "dozens" of Wisconsin birders who heard and/or saw it 6/30, 7/2, 3, 4, 5, 6, and 7.—*Robert G. Spahn, Webster, NY.*

3 July 1996, Vilas County—We (Jeff and Jim Baughman and I) began hearing this bird sing a few minutes after we arrived—about 5:45 A.M.. It sang its loud, "chirpy" song for a few minutes, then moved to another location and sang some more. It repeated this behavior numerous times, singing perhaps 3–8 minutes from each new spot. Hearing the bird and finding its general location were easy, but trying to get looks at it proved more difficult. The bird was singing in a mature Jack Pine plantation, with trees of fairly uniform size—perhaps 23–35 ft. tall. The crowns of the trees were moderately thick, while the lower 3/4 were almost bare, except for dead branches. The ground cover consisted of ferns and other small plants. (I was rather surprised to see this Kirtland's in trees so mature, for the Jack Pines in which I found this species in Michigan were much younger in age.) The bird would sit and sing in the crown of a tree, and seemed to move very little—making it difficult to spot. Eventually, however, we all managed to get several good looks at it (even brief scope views), but getting any photos proved virtually impossible. The bird did not appear to be disturbed by our presence, for it would

continue to sing as we moved around beneath it—trying to observe it.

The bird had fairly bright yellow underparts—from the throat through the belly—with bold, black spotting along the sides and flanks. The head and upperparts were mostly slate-gray or bluish-gray, with black in the lores, and a fairly prominent split white eye-ring. There were bold black spots or streaks on its back. The wing had wingbars, but they were rather subtle, being dull and indistinct—not at all bold or prominent. The overall size was large for a warbler, and, as is typical for this species, the bird almost continually pumped its tail.

The song was repeated dozens of times this morning, and it always sounded the same (at least to my ears). It was rather loud, and began with a series of 3–4 “chirps” then ended with a whistled “chee-o-we-o-weet.” I made a series of recording of this bird on a cassette tape (copy enclosed).

During the 2.5 hours of our observation this morning, the Kirtland’s moved about within an area about 1/4 mile square. Other warblers present in the same location were Nashville, Yellow-rumped and Ovenbird, as were Hermit Thrushes and Juncoes.—*Thomas Schultz, Green Lake.*

6 July 1996, Vilas County—After an anxious 15 minute wait, the Kirtland’s Warbler began to sing. Its voice was louder than all the warblers in the vicinity except for the Ovenbird. The song was the typical 7–8 note call so diagnostic of this species. The first “chip” was followed by a slight pause, then 4–5 more rapid chip notes, followed by 2 slightly slurred notes. The pitch was somewhat reminiscent of a Northern Waterthrush. The bird was

difficult to locate in the 50+ foot tall jackpines. Finally I had several unobstructed views within 5 feet of the crown. The underparts were entirely yellow with black streaks along the sides of the neck and along the flanks. On top, it was bluish gray and the back was streaked with black. The lores were quite dark and white eye crescents were noted on one of the better views. A faint white edge to the outer tail feathers was noted near the corners of the tail. The tail was pumped frequently up and down, though not as vigorously as a Palm Warbler. I had a few good looks at the Kirtland’s before we left it. It was still singing quite frequently when we departed. Note: this bird was unbanded.—*Mark Korducki, Milwaukee.*

4 July 1996, Vilas County—Shortly after arrival at the reported location of the Kirtland’s Warbler, a loud song was heard coming from a jack pine stand. The pines looked too tall for ideal Kirtland’s Warbler habitat, but the song was distinctively that of a Kirtland’s Warbler; several lower pitched loud notes, followed by several higher pitched whistle like notes, even louder and very emphatic (somewhat like the quality of a House Wren, as described in some field guides). At times, one or two intermediate pitched notes were given at the end. The overall effect was of a *very loud, low* pitched song for a warbler, and building in intensity and pitch.

Upon locating the singer near the top of a jack pine, I was rewarded with two short views of this very active warbler. First noted were the bright yellow undersides from throat to belly, becoming whitish on the under tail coverts. There were black streaks only

along the sides. Legs were black. A second look revealed the head which was unmarked gray, except for white crescents above and below the eye. The bill was blackish also. The brief look did not show any distinct wing bars (maybe

a hint of wing bars). I did not see the back. The dark tail was observed briefly to wag, but the active movements of this bird from pine to pine afforded little chance to watch "tail wagging."—*Dennis Gustafson, New Berlin.*

50 Years Ago in *The Passenger Pigeon*

Some odds and ends from this issue.

"A total of 82 species, largest total since before the war, was recorded by 53 observers, who made 12 'Christmas' counts in 10 areas. Honors for the highest count go to Milwaukee, with 56 species."

"The board of directors of our society has set the convention registration fee of this year at \$1.00."

Winnifred Smith details nesting of Orchard Orioles in the Town of Two Creeks in Manitowoc County. I talked with Ms. Smith in early April 1997 and she mentioned that her account also was detailed in the Bent series.

And from Sam Robbins who compiled the Autumn Field Notes: "We still need more contributions to the field note department, and we still need more complete reports from those who are already contributing. Therefore we are preparing special mimeographed forms for contributors to use in sending in their seasonal reports. These forms contain space for information about arrival, spring and departure dates in migration, as well as nesting data and winter records. They will be helpful and time saving for contributors, as well as for the editor. Forms will be sent to anyone upon request; a penny post-card to the field note editor will bring you yours." (Excerpts from Volume 9, 1947)

WSO Records Committee Report—Summer 1996

by Jim Frank

Eighteen documentations of nine different species were reviewed by the WSO Records Committee for the Summer 1996 season. Fifteen reports were accepted for an acceptance rate of 83%. An additional report for the summer of 1994 was also reviewed and accepted. Observers were notified of committee decisions by postcard in the case of accepted reports and by personal letter in the case of reports not accepted.

ACCEPTED

Tricolored Heron—

#96-072 *Dodge Co.*, 9 June 1996, Frank; 10 June 1996, Tessen; 12 June 1996, Domagalski; 23, 26 June 1996, T. Wood.

The identification was based on the bird being a medium-sized heron, (1/2 the size of a Great Blue Heron), the body being dark blue-gray, the lower back showing a tan or gold-brown color, but most importantly a contrasting white lower breast and belly. White was also apparent on the “front” of the neck and on two narrow plumes extending down the back of the neck.

The bill was dark, but perhaps slightly lighter or yellowish toward the base. The legs were yellow-green.

White-faced Ibis—

#96-073 *Dodge Co.*, 15 June 1996, O'Brien.

While waiting for the hoped for Tricolored Heron to arrive, this medium-sized “wader” flew in and landed. It had a long, decurved bill, a medium long neck, stiff wing beats, and dropped wing tips. The body color of uniform bronze contrasted with the dark green wings. There was a rim of white feathers surrounding the dark facial skin. Finally, the legs were pinkish instead of dark, and the eye was felt to be reddish.

Laughing Gull—

#96-076 *Manitowoc Co.*, 21 July 1996, T. Wood.

In direct comparison to Ring-billed, Bonaparte's, and Franklin's Gulls, this bird was noted to be larger than the Franklin's, but smaller than the Ring-billed Gulls. The mantle was darker gray than any of the other gull species and the head had a dingy gray, partial

hood across the back. It had a more sloping forehead and more flattened crown than the Franklin's Gulls. The dark bill was longer, thicker, and drooped at the tip relative to the Franklin's Gulls. The wing tips were black and the tail white. A broken white eyering was also reported.

Arctic Tern—

#94-052 *Green Lake Co.*, 24 June 1994, Christensen. (slides)

This "old record" was supported by several close-up photographs of the bird standing. Though the tern seemed short-legged (a very subjective field mark), had an all red bill (as do a few Common Terns), and had a grayish breast/belly (as do Common Terns), the identification was based on several other important characteristics. The folded primaries were the same gray as the back color (not a contrasting darker gray as in Common Terns). In an extended wing view, the underside of the primaries did show a *narrow*, dark back edge. Finally, the tail extended noticeably beyond the folded primary wing tips (the tail is shorter than the wing tips in Common Terns.)

(Of interest are the reports of Arctic Terns in Monroe Co., Michigan on 18 June-10 July, 1994 and Berrien Co., Michigan on 6 July, 1994).

Great Gray Owl—

#96-077 *Bayfield Co.*, 14 July 1996, Walters (photo); 21 July 1996, Walters, (photo).

Photos of each bird (on roadside signs) demonstrated the large size, overall gray-brown plumage, large facial disks, lack of ear tufts, yellow eyes, and white "moustache". (The July 14th bird was found dead—hit by a car—later that same day).

Black-chinned Hummingbird—

#96-078 *Marathon Co.*, 28 July 1996, Ott.

Although this bird was noted at a feeder with Ruby-throated Hummingbirds intermittently during the summer, this is the *only* evidence submitted on this individual. The general size and color patterns were very similar to the Ruby-throats, though this bird was perhaps a bit more slender and less aggressive than the other hummingbirds. The diagnostic difference in this bird was the metallic violet color along the bottom portion of the throat gorget, in appropriate sunlight, instead of a ruby-red color to the entire throat. The upper portion of the throat remained black in all views.

This is the first accepted record of this species for Wisconsin, but because no other corroborating reports or photographs were received, this species is only added to the state hypothetical list.

Yellow-throated Warbler—

#96-079 *Grant Co.*, 20 July 1996, C. Wood.

The bird was apparently heard and seen by numerous observers since May 28th, though this was the only summer documentation received. A warbler was described with a black forehead grading to a gray hindcrown and a black facial patch extending from the white supercilium to the moustache area. Black was also seen to extend from the white supercilium down the side of the neck, grading into black flank streaking. A white ear patch was noted below the ear coverts, with extensive white also described on the breast and belly. A yellow throat and upper breast was also reported. The gray wings had two wings bars. Of note is the addendum

to this report indicating that on July 20th, three singing males were found!

Kirtland's Warbler—

#96-080 *Vilas Co.*, 30 June, 7 July 1996, Spahn; 2 July 1996, Tessen; 3 July 1996, Schultz (tape); 4 July 1996, Gustafson; 4 July 1996, Soulen (tape); 6 July 1996, Korducki.

A larger than average warbler was described wagging its tail high in the jack pines. It had a bright yellow chin, throat, and upper belly, but a white lower belly and undertail coverts. Gray streaks were apparent only on the sides of the breast and the blue gray upper parts had darker streaking along the back. A split white eyering contrasting with an all dark face was also noted. The gray wings had very thin, indistinct white wingbars. The song was a rather loud 3-4 low pitched chirps followed by a higher pitched "chee-o-we-o-weet". Some observers likened the overall quality to a Northern Waterthrush song, but the song ascended the scale rather than descended the scale.

NOT ACCEPTED

Common Eider—

#96-074 *Door Co.*, 1 June 1996, (photo)

A brief description of a brown duck with a stocky head was accompanied by several slides. The shape and coloration of the bird did appear to represent a female eider; however, the distance precluded any distinct look at the beak commissure shape or nostril position relative to the forward extension of the facial feathers. The head profile alone is not a diagnostic distinction between the King and Common Eider. There is significant variation between subspecies of Common Eiders, eastern races

have the more classic long, sloping forehead of a Common Eider, the far western races more shortened like that of King Eiders. This individual is accepted as an eider, species uncertain.

Interestingly, this is very close to the area in northeastern Door Co. that produced the March, 1995 report of a drake King Eider and probable female.

Sharp-tailed Sandpiper—

#96-075 *Dodge Co.*, 31 July 1996.

Seen in the presence of Pectoral Sandpipers, this individual stood out with a orange-buff wash to the upper breast as well as orangish scapulars. The upper breast lacked any evidence of the heavy, well-demarcated streaking of a Pectoral Sandpiper or the light streaking of juvenile Sharp-tailed Sandpipers. The rufous cap was well demarcated, but Pectorals can appear this way too. As Sharp-tails have, the bill on this bird appeared all dark, lacking the paler base of the Pectoral. Two fairly important field marks could not be determined. The more noticeable eyering and the white supercilium that fans wider behind the eye on Sharp-tailed Sandpipers were not observed. The similar-to-Pectoral size and shape, but short-necked appearance of this bird leave us intrigued. A Reeve would perhaps have similar color patterns, but be larger and longer necked. A Buff-breasted Sandpiper would lack the rufous tones and facial markings of this bird.

If this was a juvenile Sharp-tailed Sandpiper, the extremely early date would be hard to explain. The North American records for this species come from Alaska and the Pacific Northwest. The few reports of this species south of Alaska in juvenile plumage occur from mid-September to late October. As

this observer acknowledges, this bird can at best be described as a possible Sharp-tailed Sandpiper. It hopefully will encourage observers to look at those Pectoral flocks more closely.

Fieldfare—

#96-081 *Winnebago Co.*, June-Aug., 1996.

Initially this bird was thought to be a juvenile Robin, but subsequent observations at very close range during the summer raised doubts in the observer. The orangish breast was described as streaked, but lighter in color centrally. The back was "gray and brownish". In addition a light, long streak was noted over the eye. The head seemed to be held more horizontal, more extended than a Robin's.

This has enough information to consider a Fieldfare, but there is enough variation in juvenile Robins to leave uncertainty in this individual's identity. The "orangish" breast of a Fieldfare would be expected to be limited to the

dorsal 1/3 to 1/2 of the breast with a significant portion of the mid-breast, lower breast, and belly being whitish. This distinction was not made. A distinct break in dorsal coloration should also be described. The gray head and rump should have contrasted sharply with the brown upper back and brown-black tail. No mention was made of white wing linings when the bird took flight either. The duration of this bird's presence raises the possibility of a return next summer. Hopefully more observers and photographs could eliminate the questions raised about this bird.

WSO and the Records Committee would like to thank Mark Peterson for 5 years of service. He has earned a well deserved rest from this time consuming task. Janine Polk will be joining the 1997 committee of Robbye Johnson, Randy Hoffman, Jeff Baughman, and Jim Frank.

Jim Frank

WSO Records Committee, Chair

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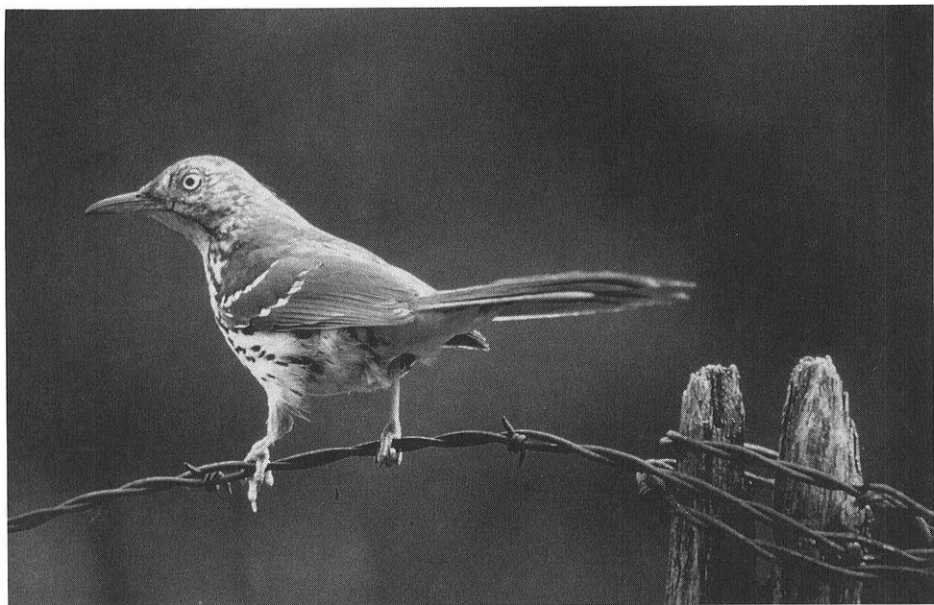
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Larry Michael's photographic work has taken him from the tundra of Alaska to the rainforests of Central America as well as the Midwest. His photography concentrates on producing transparencies that seek to abstract a scene or subject into its essence and communicate that to the viewer. His photographs have been published and widely exhibited in such places as the Milwaukee Public Library, Milwaukee Art Museum, Fuji Film Corporate Offices, galleries, and Northword Press.

Thomas K. Soulen is one of WSO's hard working Field-Note Compilers and a frequent contributor to WSO activities. An expatriate Wisconsinite, now a Professor in the University of Minnesota's Botany Department, Tom has remained active in Wisconsin ornithology.

Daryl Tessen is one of Wisconsin's most avid birders. He has been the long-time Associate Editor of *The Passenger Pigeon* and edited the 2nd and 3rd Editions of *Wisconsin's Favorite Bird Haunts*. He is a recipient of WSO's Silver Passenger Pigeon Award and Certificate of Appreciation.



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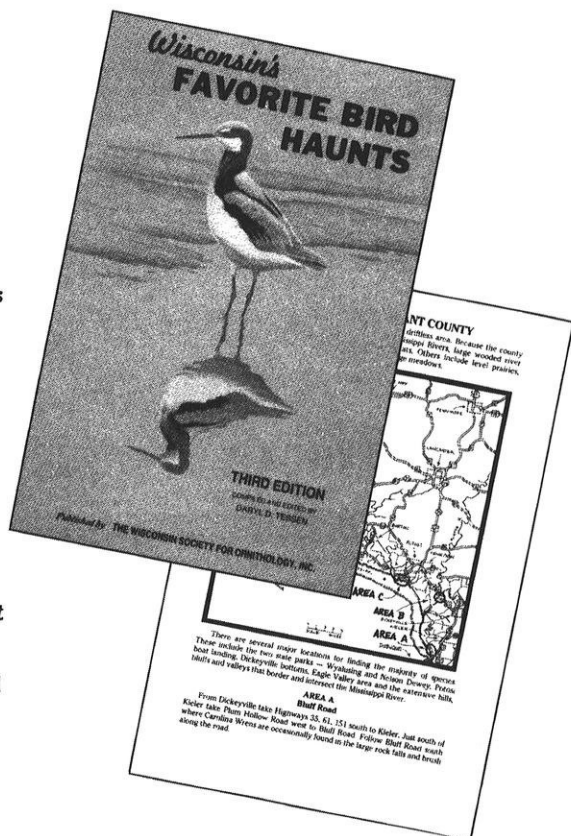
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