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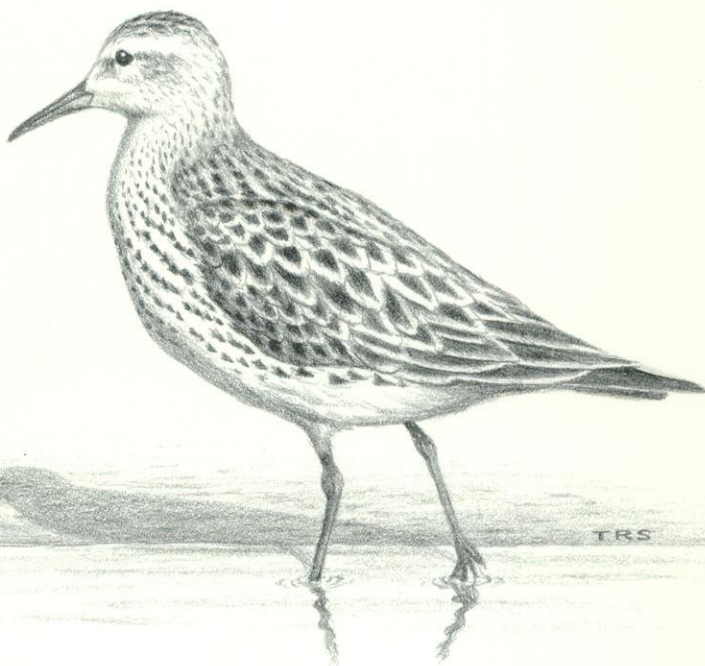


THE PASSENGER PIGEON

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THE PASSENGER PIGEON

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WSO's Records Committee

Mention the Records Committee to any active member of WSO and odds are you'll elicit an impassioned response. As President of the organization and as a current member of the Committee, I wanted to share my perspective on this much maligned, but necessary part of the WSO family. In doing so, I hope that some of the frustration and dissatisfaction with the Committee might be replaced with sensitivity to the nature of the Committee and its importance to Wisconsin ornithology.

First, let's look at the nature of the Records Committee's role. Its primary purpose is to provide a critical and impartial review of written or photographic documentation of exceptional bird sightings in the State of Wisconsin. This critical and impartial review is necessary to ensure the long-term validity of Wisconsin's species list. While the average birder might liken the Committee to the IRS, both are necessary to keep the overall system "honest."

Second, let's examine the nature of exceptional records submittals. Most birders, myself included, like to find rare, out-of-season, or out-of-place species. While the merits of this "rarity fixation" many of us suffer from are debatable, the fact remains the pursuit of rarities is an important underlying factor for getting the average birder out in the field. It is not surprising then, that subjecting one's prize sighting of a rarity to the review and approval of "strangers" (i.e., the Records Committee) can be a stressful and onerous process.

A key point to remember from the observer's view point, is that the Committee's decision on the acceptability of a record is *not* a reflection on the integrity of the observer, the skill level or experience of the observer, or, in many cases, even the validity of the record. In numerous instances, the Committee concludes that the species reported was probably, in fact, observed; it is the documentation of that observation which is being rejected as not providing conclusive evidence of the species in question.

Third, let's examine the Records Committee's "record" related to communication. The Committee has received considerable criticism as to its policies and practices in two areas:

1. The notification of observers as to the disposition of their submitted records; and

2. The provision of a summary for the membership of those records which were accepted and those which were rejected and why.

I believe it is accurate to say that some of those criticisms were deserved and were taken to heart by the Committee. Under the very able leadership of the Committee's recently departed chairperson, Janine Polk, considerable strides were made in correcting communication problems. Under Janine, the Committee instituted:

1.The transmittal of postcards informing observers of those records which have been accepted by the Committee;

2.The transmittal of brief analyses to observers as to why their records were rejected; and

3.The publication of a quarterly summary of the Records Committee's decisions in the *Badger Birder*. The practice of publishing the Committee's results will continue, but the Board may revisit the appropriateness of placing the summary in *The Passenger Pigeon* as opposed to the *Birder*.

Jim Frank has graciously volunteered to serve as the new chairperson of the Committee, and I am confident he will ensure the advances Janine set in place will continue.

The fourth, and last, point I'd like to make is to remind the membership of the volunteer nature of the Committee. Like all of WSO's committees and functions, the individuals who serve on the Records Committee do so as volunteers. They devote a considerable amount of time to the often painstaking review of the exceptional records from each of the four seasons, plus the Christmas Bird Counts. Members are sometimes faced with the unsavory task of rejecting records of friends or associates and are at the heart of perhaps the most sensitive part of the organization. While WSO's members should expect the best from their organization, I hope that the membership will keep in mind the hard, and sometimes thankless, job of the Records Committee.

A handwritten signature in black ink, appearing to read "Al Sha". The signature is fluid and cursive, with the first name "Al" and the last name "Sha" clearly distinguishable.

President

The 1991 Wisconsin Christmas Bird Counts

The 1991 Christmas Bird Counts produced 137 species, including such unusual birds as Trumpeter Swan, Spruce Grouse, Sandhill Crane, Turkey Vulture, Thayer's Gull, Great Black-backed Gull, Marsh Wren, and Lincoln's Sparrow.

by William L. Hilsenhoff

Except for the first weekend, weather for the Christmas Bird Counts was generally excellent with light winds, seasonal temperatures, and plenty of sunshine (Table 1). Unfortunately 42% of the counts were made on the first weekend when winds were exceptionally strong and temperatures quite cold. Saturday December 14, when one-third of the counts were made, was especially bad with north-west winds of 25–40 miles per hour. This greatly reduced counts of many species, but the 137 species that were found statewide was the third highest total ever recorded. Weather before the count period also was not ideal. The first week in November produced unprecedented cold that froze most lakes, and heavy snow in western and northern areas. Warm weather the following week melted the snow and even caused some lakes to open up again. The last half of November and early December had near normal tempera-

tures. Most larger lakes did not freeze until the first week of the Christmas Count period, which enhanced counts of waterfowl. Except for northern and extreme western areas of the state, there was not sufficient snow cover to force birds to feeders, roadsides, and margins of open water where they could be easily counted. This undoubtedly accounted for low totals of many species.

Several rarities highlighted the counts. Trumpeter Swans were observed at Sauk City and Green Lake as a result of the reintroduction program. Last year and this year are the only years this species has been seen on Wisconsin Christmas Counts, but we anticipate it will become a yearly occurrence. Seen for only the third time on Wisconsin Christmas Counts was a Spruce Grouse at Three Lakes, and a Sandhill Crane at Racine was only the fourth record for that species. A Turkey Vulture was seen at Fond du

Table 1. Details of the Counts.

Name of Count	Date	Sky	Snow (in)	Wind Dir.	Wind Vel.	Temp °F		Observers		Parties	Party Hours	Owl Hours
						High	Low	Feeder	Field			
Adams	12/14			W	20-25	22	16	0	5	4	18	1
Amherst	12/14	Cloudy	3	NW	15-30	15	5	2	10	4	22.5	0
Appleton	12/14	Partly Cloudy	tr	NW	25	24	16	2	24	14	78	0
Ashland	12/14	Partly Cloudy	10	W	8-15	10	10	0	7	3	24	0
Baraboo	12/26	Fair	1	SW	7-10	39	25	5	10	4	29.25	0.75
Bayfield	12/17	Cloudy	22	NNW	11-25	22	15	1	6	4	32	0
Beloit	12/14	Cloudy	tr	NW	20-35	38	20	0	20	13	48	0
Black River Falls	12/28	Fog	5		calm	30	26	9	9	4	16	2
Blanchardville	12/28	Fog	1		calm	37	30	0	3	2	17.5	2.5
Bridgeport	12/17	Fair	1	NW	10-15	30	19	0	13	6	50.5	5.5
Burlington	1/1	Cloudy	tr	S-SE	5-15	34	30	0	6	4	36.25	4.5
Caroline	12/28	Cloudy	4	W	0-10	33	27	10	1	1	9	0.5
Chippewa Falls	12/21	Fair	4		calm	36	12	0	14	5	32	0
Clyde	12/31	Cloudy	2	W	0-5	34	29	0	5	3	25	1
Columbus	12/18	Fair-PCI	2	NW	0-2	11	7	4	6	4	26	0.5
Cooksville	1/1	Cloudy	1	SW	5-18	33	29	2	4	2	18	1.5
Durand	12/14	Cloudy-Fair	5		13	12	0	7	4	30.25	0	
Ephraim	12/14	Cloudy	tr	N-NW	20-30	20	10	10	13	7	35	0
Fifield	12/21	Fair	8	SW	0-15	32	10	21	5	5	28	0
Fond du Lac	12/15	Partly Cloudy	1		10-20	20	15	0	12	5	23	0
Fort Atkinson	12/21	Fair	1	SW	0-5	30	20	0	6	3	14	0
Fremont	12/28	Cloudy	1	SW	0-5	34	28	0	4	2	18	0.75
Gilman	12/15	Fair	9	NW	5-10	15	5	4	6	3	28.5	4.5
Grantsburg	12/14	Fair	20	NW	35	7	0	0	14	7	51.5	1
Green Bay	12/14	Partly Cloudy	1	W	10-30	20	10	10	23	15	90	14
Green Lake	12/28	Cloudy	1	W	0-5	34	30	2	15	5	22.5	0.5
Gurney	12/22	Fair	18	N	5-15	36	28	0	8	2	12	0
Hales Corners	12/15	Cloudy-Fair	1	W	10-25	22	6	2	11	7	37.5	3
Hartford	12/30	Fair	2		calm	35	30	2	15	5	41	3
Hofa Park	12/15	Cloudy-Fair	1	W-N	25-20	15	0	4	10	6	40.5	5
Holcombe	12/26	Fog-Cloudy	3	N-NW	5-10	35	30	0	9	5	30	0
Horicon Marsh	12/14	Cloudy	1	NW	20-35	23	19	0	15	7	46.5	0.5
Hudson	1/1	Cloudy	20	S	7-9	34	32	1	3	2	9.25	0
Kenosha	12/14	PCI-Cloudy	1		8-20	30	20	0	2	1	8	0
Kettle Moraine	12/21	Fair	2	WSW	0-15	36	26	1	6	2	19.5	1
Kickapoo Valley	12/14	Cloudy-Fair	2	SW	20-30	14	10	0	5	3	23	0
LaCrosse	12/14	Partly Cloudy	12	NW	20-40	22	18	0	17	9	50.5	0
Lake Geneva	12/29	Cloudy	2	W	0-5	38	28	2	25	6	37	3
Lakewood	12/29	Cloudy-PCI	10	W-NW	5-10	27	19	0	1	1	8.5	0
Madison	12/14	Partly Cloudy	0	NW	25-40	23	19	5	63	28	218.25	27.25
Medford	1/1	Fog-Cloudy	6	SW	0-5	30	27	6	6	5	36	2.5
Merrill	12/27	Cloudy	9	SW	3-12	30	28	4	7	4	28.5	0.5
Milwaukee	12/14	Cloudy	1	W	25-35	26	19	4	25	10	67	1
Mount Horeb	12/15	Fair-PCI	tr	NW	10-15	18	12	21	31	19	67.5	4.5
Nelson	12/28	Cloudy	2	W	0-10	32	28	0	13	4	34	0
New Richmond	12/14	Cloudy-Fair	11	NW	15-35	14	12	2	2	1	8	0
Oconomowoc	12/29	Cloudy	tr	E	0-5	36	26	3	15	7	43	0.5
Oshkosh	12/14	PCI-MCI	3	W	25-35	24	19	0	14	9	59	1
Owen	12/14	Snow-PCI	11	W	12-40	12	10	7	15	6	47.25	1.75
Osbo	12/14	Snow-PCI	20	NWE	5-10	10	10	5	7	4	8	1
Pensaukee	12/14	Snow-MCI	tr	WNW	10-20	33	15	1	4	2	16	1.5
Peshigo	12/21	Fair-PCI	2	SE	3-4	34	29	0	6	3	27.5	0
Phelps	12/14	Cloudy-PCI	10	W	10-15	10	10	2	8	5	25	0
Platteville	12/22	Cloudy	3	W	10-18	34	20	6	22	6	18.75	3.5
Plymouth	12/14	Cloudy	tr	NNW	10-30	24	17	5	14	5	30	0.5
Poynette	12/31	Cloudy	1	S	5-7	34	30	14	25	11	80.5	5.5
Racine	12/16	Mostly Cloudy	tr	W	25-40	33	24	1	13	6	48	0
Randolph	12/16	Cloudy-Fair	0		2-4	20	10	0	3	2	10	0
Rhineland	12/21	Fair	7		36	20	13	2	2	2	10	0
Richland Center	12/21	Fair	2		0-5	31	14	1	49	21	111	1.5
Riveredge	12/21	Fair	2	W	4	33	28	25	64	22	180	12
Sauk City	12/21	Fair	1	SW	0-2	40	28	1	37	14	91	8
Shawano	12/14	Cloudy-PCI	3	NW	20-40	20	15	7	5	5	21	1
Shiocton	12/28	Cloudy	tr	SW	2-3	34	32	5	12	5	30.4	0.65
Spencer	12/21	Fair	8	S	0-10	35	20	7	18	6	49.5	3.75
Spruce	12/15	Partly Cloudy	1	WNW	10-20	12	3	1	3	1	11	0.25
Stevens Point	12/16	Snow	3	NW	15-40	16	11	5	25	9	50.25	0
Stockbridge	12/14	Cloudy	tr	NW-W	20-30	20	15	1	9	5	24.33	0
Three Lakes	12/21	Fair-PCI	10	W	0-5	32	15	6	7	6	34	0
Trempealeau	12/28	Fog-Cloudy	4		calm	35	30	4	20	7	54.5	0
Wausau	12/22	Fair	6	W	0-10	36	25	1	7	5	24	0.5
Wautoma	12/31	Cloudy	4		calm	35	27	40	8	5	20.5	2
Willard	12/28	Fog	8		calm	32	25	0	10	5	39.5	4.5
Wisconsin Rapids	12/14	Snow-Cloudy	11	NW	25-30	8	-3	3	15	7	36	0
Woodland Dunes NW	12/14	Partly Cloudy	1	NW	30-40	33	28	2	5	4	7.25	0
Woodland Dunes NE	12/15	Fair	1	W	5-15	19	10	7	5	4	26.75	0
Woodland Dunes SW	12/21	Fair-PCI	0	NW-N	0-5	33	25	3	8	5	42	2
Woodland Dunes SE	12/22	Fair	1	SW	5-15			7	10	9	49.25	2
TOTAL								319	1004	475	2970.48	145.15

Lac, and it represented only the fifth Christmas Count sighting for this species. Four species were seen for only the sixth time on Wisconsin Christmas Counts. These included a Thayer's Gull at Sauk City, Great Black-backed Gulls at Oshkosh and Sauk City, a Marsh Wren at Poynette, and Peregrine Falcons at Bridgeport, Madison, Milwaukee, and Racine. The six sightings of Peregrine Falcons are a tribute to the success of the captive rearing and release program. A Lincoln's Sparrow came to a feeder during the Stevens Point count period, but not on the day of the count. Three other rarities, an Osprey, a Broad-winged Hawk, and a Loggerhead Shrike were not included because documentation was inadequate or lacking.

Fifty or more species were found on only 12 counts this year, probably because of the poor weather on the first weekend. Six counts reported more than 60 species, Appleton (62), Milwaukee (64), Poynette and Riveredge (72), Sauk City 73, and Madison (80). Information on weather and participation in each count is summarized in Table 1.

LOCATION AND DETAILS OF THE COUNTS

Seventy-eight counts were compiled this year, one less than last year. Welcomed were three new northern counts, Gurney, Spruce, and Hofa Park. Returning were counts at Wisconsin Rapids (last made in 1988), Fort Atkinson, Horicon Marsh, and Kettle Moraine. The latter three were made last year, but either had insufficient participation or arrived too late to be included in the compilation. Counts at Amery, Bowler, Brule, Clam Lake, So-

lon Springs, Sturgeon Bay, and Waukesha were not repeated this year, and the count at Luck was not compiled because it included only feeder observations. The location of each count is shown in Figure 1. Counts are numbered in groups from north to south and west to east. An alphabetical listing follows (bold face type) along with the count number (Figure 1), the location of the count center, and the name, address, and telephone number of the compiler.

Adams (48); 1.25 miles S of Dellwood on Hwy. Z; Ted May, Rt. 1, 1803 Abrams St., Whitehall, WI, 54773; (715) 538-4370. **Amherst** (28); Jct. Hwys. A and B; David Borchardt, 10296 Yellowbrick Rd., Amherst, WI 54406; (715) 824-3971. **Appleton** (37); Jct. Hwys. 10 and 45; John Shillinglaw, 1952 Palisades Dr., Appleton, WI 54915; (414) 731-4222. **Ashland** (2); Jct. Hwys. 2 and 118; Dick Verch, Biology Department, Northland College, Ashland, WI 54806; (715) 682-1335. **Baraboo** (49); Jct. City View Rd.

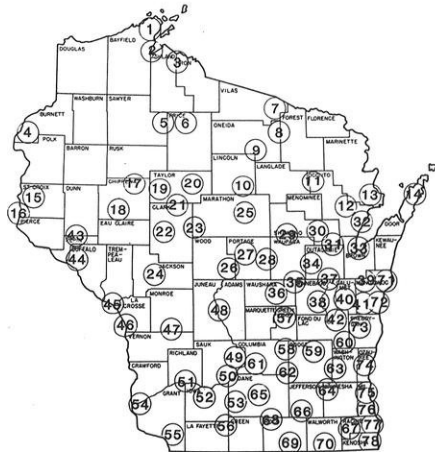


Figure 1. Locations of the 1991 Wisconsin Christmas Bird Counts.

and Hwy. A; Raymond Dischler, 3830 Anchor Dr., Madison, WI 53714; (608) 981-2282. **Bayfield** (1); T 50 N, R 5 W, S-22; Albert Roy, 906 Water St., Ashland, WI 54806; (715) 682-5334. **Beloit** (69); Jct. Tracy and Eau Claire Rd.; John & Edith Brakefield, 6701 Fenrick Rd. W., Evansville, WI 53536; (608) 876-6242. **Black River Falls** (24); Jct. Hwys. H and 54; Judy Allen, Rt. 2, Box 128, Black River Falls, WI 54615; (608) 488-4154. **Blanchardville** (56); 2.5 miles SW of Blanchardville; David Willard, Bird Division, Field Museum of Natural History, Roosevelt Rd. at Lakeshore Dr., Chicago, IL 60605; (312) 922-9410 ext. 269. **Bridgeport** (54); 2 miles SE of Bridgeport; Sam Robbins, 14 S. Roby Rd., Madison, WI 53705; (608) 233-3581. **Burlington** (67); Jct. Hwy A and Crossway Rd.; Gerald DeBoer, 15935 2-mile Rd., Racine, WI 53405 (414) 835-4642. **Caroline** (29); 2 miles W of Caroline; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Chippewa Falls** (18); Jct. Hwys. 178 and S; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723 3815. **Clyde** (52); Jct. Hwy. ZZ and Weaver Rd.; Steven Greb, 3402 Rutland-Dunn Rd., Stoughton, WI 53589; (608) 295-3225. **Columbus** (62); Jct. Johnson and Jahnke Sts.; Phyllis Johnson, W12156 Johnson Rd., Columbus, WI 53925; (414) 623-2447. **Cooksville** (68); Cooksville; John Wilde, Rt. 1, Box 429. Evansville, WI 53536; (608) 882-5352. **Durand** (43); Jct. Hwys. 25 and DD 3 miles N of Durand; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723-3815. **Ephraim** (14); Hwy. A 3 miles S of Jct. with Hwy 42; Paul and Kathleen Regnier, P.O. Box 152, Baileys Harbor, WI 54202; (414) 839-2802. **Fifield** (6);

Fifield Post Office; Thomas Nicholls, 2160 Draper Ave., Roseville, MN 55113; (612) 636-2592. **Fond du Lac** (42); Jct. Tower and Cody Roads; Jeffrey Baughman, W8985 CTH SS, Adell, WI 53001; (414) 626-4713. **Fort Atkinson** (66); Jct. Main St. and Sherman Ave.; Richard Wanie, W5920 Lee Dr., Fort Atkinson, WI 53538; (414) 563-6274. **Fremont** (35); Jct. Hwys. I and HH 4 miles SW of Fremont; Daryl Tessen, 2 Pioneer Park Place, Elgin, IL 60123; (708) 695-2464. **Gilman** (19); 1 mile W of Miller Dam; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Grantsburg** (4); Jct. Hwys. 70 and 48; Dennis Allaman, 506 W. St. George, Grantsburg, WI 54840; (715) 463-2366. **Green Bay** (33); Jct. Allouez and S. Webster Avenues; John Jacobs, Neville Public Museum, 210 Museum Pl., Green Bay, WI 54303; (414) 448-4460. **Green Lake** (57); Jct. Hwy. J and Swamp Rd.; Thomas Schultz, N6104 Honeysuckle Lane, Green Lake, WI 54941; (414) 294-3021. **Gurney** (3); Gurney; John Elias, HCR 780, Saxon, WI 54559; (715) 893-2358. **Hales Corners** (76); Jct. Hwy 41 and Puetz Rd. (Milwaukee Co. only); John Schaeffer, 6636 W. Coldspring Rd., Greenfield WI 53220; (414) 543-3429. **Hartford** (63); Jct. Hwys. 60 and 83; Judy Haseleu, 337 W. State St., Hartford, WI 53027; (414) 673-5865. **Hofa Park** (31); Jct. Hofa Park Dr. and Parkview; Elaine Friedrich, W1776 Hofa Park Dr., Seymour, WI 54165; (414) 822-3016. **Holcombe** (17); 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** (59) Jct. Main Ditch and Main Dike in Refuge; Bill Volkert, 1210 N. Palmatory St., Horicon, WI

53032; (414) 485-3018. **Hudson** (16); Afton, MN; Boyd & Helen Lien, 5148 29th Ave. S., Minneapolis, MN 55417; (612) 729-5982. **Kenosha** (78); Jct. Hwys. 158 and HH (Kenosha Co. only); Ron Hoffmann, Box 886, Kenosha, WI 53141; (414) 654-5854. **Kettle Moraine** (60); Hwy. DD, W of Auburn Lake; Bill Volkert, W996 Birchwood Dr., Campbellsport, WI 53010; (414) 533-8939. **Kickapoo Valley** (47); Jct. Hwys. T and 131; Eric Epstein, Rt. 2, Box 100, Norwalk, WI 54648; (608) 823-7837. **LaCrosse** (46); LaCrosse Courthouse; Fred Leshner, 509 Winona St., LaCrosse, WI 54603; (608) 783-1149. **Lake Geneva** (70); 42° 15' Lat., 88° 30' Long., near William Bay; Gaylord Culp, 1749 Summit Dr., Lake Geneva, WI 53147; (414) 248-8177. **Lakewood** (11); Jct. Hwys. T and FR 2117; John Woodcock, 1718 Cedar Grove Dr., Apt. 3A, Manitowoc, WI 54220; (414) 684-0447. **Luck** (not compiled); Jct. Roads 180 NS and 180 EW in Polk Co.; John Nygren, 920 3rd Ave., Luck, WI 54853; (715) 472-2508. **Madison** (65); State Capitol; Sam Robbins, 14 S. Roby Rd., Madison, WI 53705; (608) 233-3581. **Medford** (20); 2.5 miles NE of Whittlesey; Michael Riegert, N 763 Oriole Dr., Stetsonville, WI 54480; (715) 678-2627. **Merrill** (10); Jct. South End Rd. and Hwy. 107; Alan Rusch, 3342 Westview Lane, Madison, WI 53713; (608) 274-1224. **Milwaukee** (75); Jct. Port Washington Rd. and Hampton Ave.; Jim Frank, 4339 W. Laverna Ave., Mequon, WI 53092; (414) 242-2443. **Mount Horeb** (53); Mount Horeb; Sharon & Warren Gaskill, 10405 Bell Rd., Black Earth, WI 53515; (608) 767-3642. **Nelson** (44); 1 mile S of Jct. Hwys. I and D; C.A. Kemper, 733 Maple St., Chippewa

Falls, WI 54729; (715) 723-3815. **New Richmond** (15); 2 miles E of Boardman; Joseph Merchak, 210 Ilwaco Rd., River Falls, WI 54022; (715) 425-1169. **Oconomowoc** (64); Hwy 67, 2 miles N of Oconomowoc; Alex Kailing, W330 N8275 W. Shore Dr., Hartland, WI 53029; (414) 966-1072. **Oshkosh** (38); Jct. Hwys. 21 and 41; Thomas Ziebell, 1322 Ceape Ave., Oshkosh, WI 54901; (414) 235-0326. **Owen** (21); Hwy. D 2.5 miles N of Hwy. 29; Nick Risch, W5172 Allman Ave., Medford, WI 54451; (715) 748-6177. **Oxbo** (5); Jct. Hwys. EE and 70; Maybelle Hardy, Rt. 1, Box 263, Park Falls, WI 54552; (715) 762-3178. **Pensaukee** (32); Pensaukee; Thomas Erdman, 4093 Hwy. S, Route 2, Oconto, WI 54153; (414) 465-2713. **Peshigo** (13); Leo Feller, 530 Rainbow Circle, Peshigo, WI 54157; (715) 582-3373. **Phelps** (7); Jct. FR 2139 and FR 2533, 2 miles S of Phelps; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479-8055. **Platteville** (55); Cornelia; Tom Goltry, 660 Pioneer Rd., Platteville, WI 53818; (608) 348-9666. **Plymouth** (73); Jct. Hwys. 23 and C; Harold Koopman, 415 Caroline St., Plymouth, WI 53073; (414) 892-8101. **Poynette** (61); Jct. Hwys. 51 and CS; Mark & Sue Martin, Goose Pond Sanctuary, W7468 Prairie Lane, Arlington, WI 53911; (608) 635-4160. **Racine** (77); 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** (58); Hwy P midway between Cambria and Randolph; Charles Gilmore, 115 Meadowood Dr., Randolph, WI 53956; (414) 326-3221. **Rhineland** (9); Rhineland; Ced Vig, 919 Birch Bend, Rhineland, WI 54501; (715) 363-3047. **Richland Center** (51); Jct.

Hwys. O and OO SE of Richland Center; Robert Hirschy, University of Wisconsin Center-Richland, Richland Center, WI 53581; (608) 647-6186. **Riveredge (formerly Newburg)** (74); Jct. Hwys. 33 and I; Susan Stromberg, Riveredge Nature Center, P.O. Box 26, Newburg, WI 53060; (414) 675-6888. **Sauk City** (50); 2.5 miles SE of Witwen; Becky Isenring, 6869 Taylor Road, Sauk City, WI 53583; (608) 643-6906. **Shawano** (30); 2.5 miles N of Lunds; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754-2661. **Shiocton** (34); Jct. Hwys. M and 54; James Anderson, Mosquito Hill Nature Center, Rt. 1, Rogers Rd., New London, WI 54961; (414) 779-6433. **Spencer** (23); Jct. Hwys. F and 153; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659-3910. **Spruce** (12); 1½ miles N of Spruce on Hwy. B; Jerry Smith, 6865 Fredrickson Road, Lena, WI 54139; (414) 829-6353. **Stevens Point** (27); Old Main Building, University of Wisconsin-Stevens Point; Nancy Stevenson, 1890 Red Pine Lane, Stevens Point, WI 54481; (715) 341-0084. **Stockbridge** (40); Kloten Swamp, 3 miles SE of Stockbridge; Carroll Rudy, W3866 Hwy. H, Chilton, WI 53014; (414) 849-9021. **Three Lakes** (8); 6 miles E of Three Lakes; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479-8055. **Trempealeau** (45); Jct. Hwy K and Fremont St., Trempealeau; Thomas Hunter, 575 Jay St., Trempealeau, WI 54661; (608) 534-6233. **Wausau** (25); Jct. Grand Ave. and Thomas St.; Duane Goetsch, 3005 Heron Ave., Wausau, WI 54401; (715) 845-2651. **Wautoma** (36); Mount Morris; Delbert Greenman, 1218 Hwy W, Redgranite, WI 54970; (414) 787-3036. **Willard** (22); 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** (26); Wisconsin Rapids Airport; Kathy Brock, 6847 North Rd., Vesper, WI 54469; (715) 569-4579. **Woodland Dunes NW** (39), **NE** (71), **SW** (41), and **SE** (72); All in Manitowoc Co. as drawn on a map; Bernard Brouchoud, Woodland Dunes Nature Center, P.O. Box 2108, Manitowoc, WI 54221-2108; (414) 793-4007.

RESULTS OF THE COUNTS

Results are reported in Tables 2–8. The more common species are reported in Tables 2–7, with counts in similar areas of the state grouped together in each table. In Table 7 the number of each species is compared with the average for the previous ten years, corrected for participation (total party hours). Uncommon and rare species are listed in Table 8 in the order of their count number, the same order used in Tables 2 to 7. A summary of general abundance within various groups of species follows.

Waterfowl—Because only larger lakes were open at the beginning of the count period, with most of them freezing during the first week of the count, waterfowl numbers were lower than normal or about average for most species. Numbers of Mallards and Common Goldeneyes were somewhat below normal, while counts of American Black Ducks were significantly below normal. Among common species, only the Common Merganser was distinctly more abundant than usual. Among uncommon species, Shovelers and Lesser Scaup were more numerous, while American Wigeons and Oldsquaws

Table 2. Number of each species in northern Wisconsin found on 19 or more counts.

Species	1 Bayfield	2 Ashland	3 Gurney	4 Grantsburg	5 Oshkosh	6 Effingham	7 Phelps	8 Three Lakes	9 Rhineland	10 Merrill	11 Lakewood	12 Spruce	13 Peshtigo	14 Ephraim
Great Blue Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	2	0	1	0	0	0	0	0	0	0	0	0	136
American Black Duck	0	28	0	0	0	0	0	0	0	0	0	0	2	22
Mallard	8	39	0	29	0	3	0	0	419	23	0	0	0	318
Common Goldeneye	9	0	0	0	0	1	0	0	0	0	0	0	41	116
Common Merganser	0	0	0	0	0	0	0	0	0	0	0	0	0	38
Bald Eagle	2	1	3	7	4	0	2	0	0	0	0	3	6	*
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sharp-shinned Hawk	0	0	0	0	0	0	0	0	0	*	0	0	1	0
Cooper's Hawk	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Goshawk	0	0	0	0	0	2	0	0	0	0	0	2	2	*
Red-tailed Hawk	0	0	0	7	0	0	0	0	0	7	0	11	6	0
Rough-legged Hawk	0	0	1	16	0	3	0	0	0	23	2	21	17	4
American Kestrel	0	0	0	0	0	0	0	0	0	0	0	2	5	0
Ring-necked Pheasant	0	0	0	6	0	0	0	0	0	0	0	0	0	2
Ruffed Grouse	8	3	6	5	17	17	4	6	13	3	1	6	1	*
Wild Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Herring Gull	230	0	1	0	0	0	0	0	0	0	0	0	*	1084
Rock Dove	12	78	0	112	0	22	0	3	94	127	8	117	90	20
Mourning Dove	0	4	0	0	0	23	0	4	37	69	0	64	254	118
Eastern Screech-Owl	0	0	0	0	1	0	0	0	0	0	0	*	0	0
Great Horned Owl	0	0	0	2	0	0	0	0	1	1	0	1	1	0
Barred Owl	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Belted Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-headed Woodpecker	0	0	0	1	0	1	0	0	0	0	0	0	0	1
Red-bellied Woodpecker	0	0	0	13	0	0	0	0	1	1	0	1	3	7
Downy Woodpecker	9	4	8	37	22	39	24	90	20	14	12	12	10	23
Hairy Woodpecker	6	3	7	12	21	47	21	17	15	10	5	6	3	29
Northern Flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pileated Woodpecker	1	2	1	10	2	6	1	5	4	0	0	*	1	2
Horned Lark	0	0	0	0	0	0	0	0	0	0	0	8	0	0
Blue Jay	50	32	22	157	26	81	43	30	43	60	13	29	96	39
American Crow	11	67	1	213	42	94	12	20	24	239	14	106	304	99
Common Raven	41	51	43	5	40	32	88	59	3	5	4	5	19	23
Black-capped Chickadee	84	76	62	358	111	628	327	388	295	255	72	117	276	148
Red-breasted Nuthatch	13	1	5	3	10	94	42	144	31	24	10	0	3	19
White-breasted Nuthatch	3	7	4	58	14	48	17	28	50	25	3	8	22	27
Brown Creeper	0	0	0	1	2	7	*	3	8	1	1	0	*	0
Golden-crowned Kinglet	0	0	0	0	0	8	0	2	0	0	4	1	0	5
American Robin	0	*	0	0	0	0	0	0	0	0	0	0	1	*
Cedar Waxwing	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Northern Shrike	0	1	0	4	1	3	0	1	0	4	0	5	5	0
European Starling	60	153	8	52	0	74	33	12	0	134	11	428	657	64
Northern Cardinal	0	2	0	23	0	3	0	0	0	20	0	1	7	53
American Tree Sparrow	0	0	0	72	0	0	0	0	0	8	2	142	71	9
Song Sparrow	0	0	0	0	0	0	0	0	0	0	0	0	0	2
White-throated Sparrow	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark-eyed Junco	2	3	0	9	1	9	5	1	0	6	0	14	39	25
Snow Bunting	0	0	0	8	0	0	0	1	0	65	0	0	510	0
Red-winged Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Grackle	0	0	0	0	0	2	0	1	0	1	0	0	0	10
Purple Finch	6	46	0	9	10	80	0	8	70	49	0	7	4	22
House Finch	0	1	0	0	0	0	0	0	0	0	0	15	*	15
Common Redpoll	41	21	92	6	307	352	128	268	11	490	34	390	53	174
Pine Siskin	15	2	2	15	1	13	0	0	61	144	0	3	6	26
American Goldfinch	0	29	0	55	4	25	7	0	14	17	0	60	54	65
Evening Grosbeak	68	5	26	12	130	223	219	245	251	99	89	17	6	0
House Sparrow	23	52	28	314	0	15	0	10	50	337	0	265	289	4
Total Species	26	30	19	34	23	32	21	30	24	31	18	32	38	42

*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 Wisconsin found on 19 or more counts.

Species	15 New Richmond	16 Hudson	17 Holcombe	18 Chippewa Falls	19 Gilman	20 Medford	21 Owen	22 Willard	23 Spences	24 Black River Falls	25 Wausau	26 Wisconsin Rapids	27 Stevens Point	28 Amherst
Great Blue Heron	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Canada Goose	231	565	0	0	1	1	0	0	0	5	0	0	0	0
American Black Duck	0	0	0	32	0	0	0	0	0	0	3	0	9	0
Mallard	75	531	0	820	0	1	0	0	0	0	127	0	547	15
Common Goldeneye	2	29	0	4	0	0	0	0	0	0	20	0	268	0
Common Merganser	0	6	0	0	0	0	0	0	0	0	0	0	0	0
Bald Eagle	0	3	3	2	1	0	6	0	1	4	1	0	2	1
Northern Harrier	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Sharp-shinned Hawk	0	0	0	0	1	1	1	2	0	1	0	1	0	0
Cooper's Hawk	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Northern Goshawk	0	0	0	1	0	0	0	0	2	0	0	0	1	1
Red-tailed Hawk	2	2	7	14	0	1	5	9	3	5	4	2	0	1
Rough-legged Hawk	2	1	0	11	11	8	7	14	0	4	9	0	7	3
American Kestrel	0	1	1	2	0	1	1	4	10	1	2	0	0	*
Ring-necked Pheasant	1	1	0	3	2	1	0	0	0	0	0	1	0	5
Ruffed Grouse	0	1	12	0	9	6	7	7	9	17	*	2	0	*
Wild Turkey	0	0	0	0	0	0	0	0	0	1	0	0	0	*
Ring-billed Gull	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
Rock Dove	58	95	425	781	185	47	219	352	829	99	168	11	98	228
Mourning Dove	*	0	0	17	1	102	72	25	204	11	29	13	93	36
Eastern Screech-Owl	0	*	0	0	0	0	*	0	0	0	0	0	0	0
Great Horned Owl	0	0	1	1	1	2	1	2	2	*	1	2	1	0
Barred Owl	0	*	1	0	3	1	0	4	3	1	0	0	0	1
Belted Kingfisher	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-headed Woodpecker	0	0	1	1	0	1	1	0	0	4	0	1	0	1
Red-bellied Woodpecker	1	4	4	4	3	3	15	9	4	15	2	2	0	2
Downy Woodpecker	15	7	16	21	32	35	68	20	36	37	29	6	25	19
Hairy Woodpecker	6	3	12	10	32	21	45	18	18	18	14	3	13	9
Northern Flicker	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Pileated Woodpecker	2	1	4	2	5	2	1	1	0	6	1	2	0	0
Horned Lark	0	0	0	0	0	0	0	0	5	0	0	0	0	23
Blue Jay	53	34	158	322	135	110	183	158	158	149	33	32	63	65
American Crow	80	140	196	534	241	550	695	204	360	93	245	12	366	160
Common Raven	0	0	4	0	21	8	7	3	0	0	2	0	0	0
Black-capped Chickadee	63	11	444	324	336	658	612	464	417	112	146	6	362	134
Red-breasted Nuthatch	1	0	3	3	26	59	8	1	2	2	11	5	6	7
White-breasted Nuthatch	8	6	57	50	19	38	35	41	42	47	23	17	39	29
Brown Creeper	1	0	1	4	1	0	1	0	0	2	6	0	1	0
Golden-crowned Kinglet	0	0	0	0	0	0	1	0	0	0	4	0	0	0
American Robin	0	0	0	1	0	1	1	0	0	0	5	0	0	*
Cedar Waxwing	0	53	0	0	0	0	0	0	0	0	0	*	0	0
Northern Shrike	0	2	9	6	3	6	4	5	8	1	6	0	1	1
European Starling	6	88	487	753	117	174	277	543	444	67	517	1	102	368
Northern Cardinal	40	14	14	43	6	24	57	41	20	55	3	19	36	27
American Tree Sparrow	3	21	3	34	8	6	130	22	2	9	3	27	25	31
Song Sparrow	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White-throated Sparrow	0	0	0	2	1	0	1	0	0	0	1	0	0	0
Dark-eyed Junco	11	30	2	35	25	7	44	57	12	104	11	42	128	157
Snow Bunting	0	0	3	0	30	145	693	5	482	0	10	0	526	262
Red-winged Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Grackle	0	0	0	1	0	0	2	0	5	1	0	0	0	0
Purple Finch	11	16	10	0	54	141	41	1	22	33	10	0	19	31
House Finch	0	0	0	6	4	14	0	0	6	0	40	2	19	1
Common Redpoll	*	0	85	19	261	659	38	307	529	5	135	17	93	25
Pine Siskin	4	0	0	3	5	34	12	30	1	8	0	0	26	82
American Goldfinch	17	27	32	25	13	52	66	93	117	79	8	134	145	131
Evening Grosbeak	0	0	20	0	138	128	4	31	6	6	3	26	40	0
House Sparrow	38	113	418	796	132	467	1219	2146	1676	124	225	12	335	36
Total Species	26	32	30	39	37	42	40	32	37	35	37	26	36	33

*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 19 or more counts.

Species	29 Caroline	30 Shawano	31 Hofa Park	32 Pensaukee	33 Green Bay	34 Shiocton	35 Fremont	36 Wautoma	37 Appleton	38 Oshkosh	39 Woodland Dunes NW	40 Stockbridge	41 Woodland Dunes SW	42 Fond du Lac
Great Blue Heron	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Canada Goose	4	1	0	9	4902	0	1	12	250	34	0	0	1525	77
American Black Duck	1	1	0	0	356	0	13	*	28	34	0	0	0	9
Mallard	308	14	0	0	3360	0	330	60	945	650	0	0	67	19
Common Goldeneye	0	2	0	56	9	0	0	0	513	106	1	0	3	1
Common Merganser	0	5	0	157	1639	0	0	0	282	450	0	0	0	0
Bald Eagle	*	2	0	1	4	0	3	1	11	4	0	0	0	2
Northern Harrier	0	0	1	*	3	0	0	1	1	1	0	*	5	0
Sharp-shinned Hawk	0	1	0	*	0	0	0	0	2	0	0	0	0	0
Cooper's Hawk	0	0	1	0	1	1	0	0	1	2	0	0	0	*
Northern Goshawk	0	1	0	*	*	1	1	1	1	3	0	0	0	*
Red-tailed Hawk	3	11	36	10	38	30	25	6	11	34	7	7	8	7
Rough-legged Hawk	3	12	4	*	6	18	40	17	5	9	2	1	16	5
American Kestrel	1	2	14	1	20	38	25	0	8	31	4	4	19	2
Ring-necked Pheasant	0	5	*	*	0	0	*	1	1	4	1	0	0	1
Ruffed Grouse	2	2	0	2	0	0	0	10	1	0	2	1	0	0
Wild Turkey	0	0	0	0	0	0	0	3	0	0	0	12	0	0
Ring-billed Gull	0	0	0	0	132	0	0	0	1000	230	15	128	0	28
Herring Gull	0	0	0	890	6090	0	0	0	3000	617	5	35	1	6
Rock Dove	17	342	368	198	682	552	502	110	210	1105	202	481	214	184
Mourning Dove	55	162	64	97	367	571	253	136	423	360	83	81	141	94
Eastern Screech-Owl	*	0	0	1	3	0	1	0	0	0	0	0	0	0
Great Horned Owl	3	2	3	2	3	2	3	6	2	3	0	1	1	3
Barred Owl	1	0	0	0	1	1	*	1	2	0	0	0	0	0
Belted Kingfisher	1	0	0	0	0	1	0	1	0	0	0	0	0	0
Red-headed Woodpecker	0	*	0	0	*	0	1	1	0	0	1	*	0	0
Red-bellied Woodpecker	5	5	1	4	14	12	6	18	6	6	2	3	1	3
Downy Woodpecker	15	16	32	8	32	41	35	46	31	39	9	21	11	21
Hairy Woodpecker	8	9	9	5	15	14	7	24	8	8	4	11	3	9
Northern Flicker	0	0	1	0	*	1	3	0	1	3	0	3	2	2
Pileated Woodpecker	1	3	0	*	0	4	2	3	0	0	0	0	1	0
Horned Lark	0	0	34	0	22	9	0	0	25	22	0	92	2	1
Blue Jay	65	28	47	27	35	86	75	196	43	61	24	23	36	40
American Crow	67	344	95	63	169	107	202	192	198	55	52	23	77	70
Common Raven	3	0	19	1	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	191	146	72	92	159	120	108	323	63	48	123	28	78	113
Red-breasted Nuthatch	9	9	0	0	0	0	2	19	2	2	2	0	0	1
White-breasted Nuthatch	18	19	9	11	63	32	45	72	31	33	20	9	18	15
Brown Creeper	0	1	0	1	2	2	0	1	2	3	2	2	1	3
Golden-crowned Kinglet	*	0	0	0	*	0	0	0	3	14	3	0	5	1
American Robin	0	0	0	*	3	1	0	0	1	2	0	0	0	0
Cedar Waxwing	0	3	0	16	7	0	0	0	1	4	0	0	0	0
Northern Shrike	1	2	1	3	4	2	*	1	0	*	1	0	3	3
European Starling	21	435	494	110	349	874	508	8	162	590	66	491	928	75
Northern Cardinal	28	21	8	7	90	40	29	83	63	30	22	11	8	28
American Tree Sparrow	49	19	35	99	74	264	440	51	23	241	12	11	24	54
Song Sparrow	0	0	0	0	1	0	1	0	4	0	0	0	3	0
White-throated Sparrow	0	1	0	2	15	0	0	0	5	1	1	0	0	0
Dark-eyed Junco	80	83	57	19	161	131	108	440	143	104	32	35	19	53
Snow Bunting	1	300	354	199	213	0	1	28	50	30	52	772	0	15
Red-winged Blackbird	0	0	1	0	6	0	0	0	8	*	0	2	0	0
Common Grackle	0	1	21	0	4	0	1	0	2	2	0	1	0	0
Purple Finch	37	86	0	33	7	0	4	24	14	1	0	4	4	19
House Finch	2	18	13	0	84	50	14	7	163	30	0	0	0	0
Common Redpoll	41	34	0	48	29	26	80	3	0	6	0	1	0	0
Pine Siskin	66	34	0	*	19	0	0	57	1	*	2	*	2	29
American Goldfinch	182	175	24	91	157	42	145	225	43	30	24	7	22	34
Evening Grosbeak	2	39	0	6	0	0	0	36	0	0	0	0	0	0
House Sparrow	76	154	1921	264	1180	1267	525	35	263	2361	171	1248	492	477
Total Species	36	45	34	38	56	33	39	42	62	49	32	33	35	37

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

Table 5. Number of each species in west and southwest Wisconsin found on 19 or more counts.

Species	43 Durand	44 Nelson	45 Trempealeau	46 LaCrosse	47 Kickapoo Valley	48 Adams	49 Baraboo	50 Sauk City	51 Richland Center	52 Clyde	53 Mount Horeb	54 Bridgeport	55 Platteville	56 Blanchardville
Great Blue Heron	0	4	3	0	0	0	1	4	4	1	0	1	0	1
Canada Goose	0	0	0	0	0	1653	1675	0	1	0	0	7	0	0
American Black Duck	0	0	1	0	0	1	1	15	0	0	0	10	0	0
Mallard	0	29	36	594	0	26	35	272	70	0	0	471	8	0
Common Goldeneye	0	110	0	0	0	2	16	164	0	0	1	0	0	0
Common Merganser	0	162	0	0	0	21	0	58	0	0	1	0	0	0
Bald Eagle	40	0	7	31	2	0	8	125	7	0	3	98	10	0
Northern Harrier	0	0	3	0	0	4	0	3	4	1	9	0	1	2
Sharp-shinned Hawk	1	0	2	0	0	0	2	3	5	0	3	0	1	0
Cooper's Hawk	0	1	3	0	0	0	1	5	4	0	2	2	0	0
Northern Goshawk	2	1	0	0	0	0	0	1	0	0	0	1	0	0
Red-tailed Hawk	8	26	19	22	32	3	17	107	79	8	71	42	27	25
Rough-legged Hawk	7	8	6	4	15	9	12	23	26	0	7	28	10	1
American Kestrel	0	3	8	0	4	1	3	33	36	1	3	22	10	9
Ring-necked Pheasant	0	5	0	0	0	0	0	6	2	0	9	0	2	3
Ruffed Grouse	1	0	0	5	9	6	1	6	12	17	11	0	3	2
Wild Turkey	8	13	1	33	10	51	0	205	491	28	17	113	0	5
Ring-billed Gull	0	0	0	0	0	0	0	7	0	0	0	0	0	0
Herring Gull	0	1	0	0	0	0	0	252	0	0	2	0	0	0
Rock Dove	94	424	454	194	136	0	228	1186	996	13	206	269	37	75
Mourning Dove	2	31	71	28	0	0	7	421	99	1	121	18	28	13
Eastern Screech-Owl	1	0	0	0	0	0	1	7	2	0	0	7	0	0
Great Horned Owl	0	6	0	2	0	0	1	17	3	0	8	10	1	19
Barred Owl	0	0	2	5	1	0	1	5	2	2	2	1	2	0
Belted Kingfisher	0	0	2	1	2	0	0	1	3	3	0	7	3	2
Red-headed Woodpecker	0	5	31	2	0	1	2	2	24	1	9	45	4	0
Red-bellied Woodpecker	12	30	42	23	19	5	12	140	78	3	44	82	14	20
Downy Woodpecker	12	38	75	28	12	15	24	158	92	7	63	63	24	27
Hairy Woodpecker	9	23	47	15	4	8	10	36	38	1	36	29	4	8
Northern Flicker	0	0	1	0	0	6	0	7	0	0	3	1	0	0
Pileated Woodpecker	2	5	1	2	1	2	3	28	14	1	5	5	0	0
Horned Lark	0	2	0	0	21	0	8	56	0	0	41	8	6	4
Blue Jay	183	313	401	119	122	121	225	738	598	87	219	257	99	92
American Crow	183	235	401	405	391	230	257	953	904	49	193	229	164	133
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	98	237	238	159	68	175	145	674	393	46	176	308	74	96
Red-breasted Nuthatch	*	0	8	0	0	11	0	18	1	0	2	3	0	2
White-breasted Nuthatch	13	63	74	31	21	64	53	204	139	31	50	151	16	43
Brown Creeper	0	1	2	1	1	0	1	11	3	0	0	3	0	2
Golden-crowned Kinglet	0	0	0	0	1	0	3	15	0	0	0	0	0	0
American Robin	1	0	0	0	1	3	2	20	0	0	0	0	0	0
Cedar Waxwing	0	0	0	0	0	0	0	28	1	0	0	20	6	0
Northern Shrike	2	3	0	0	1	0	2	2	1	0	3	0	0	1
European Starling	121	489	652	69	248	10	272	1818	924	310	170	581	65	214
Northern Cardinal	67	163	153	139	74	29	50	283	555	30	151	257	89	60
American Tree Sparrow	52	42	35	9	21	5	210	686	290	15	234	127	135	322
Song Sparrow	0	0	2	0	0	0	1	13	2	0	11	3	0	7
White-throated Sparrow	0	0	1	5	0	0	1	1	0	0	0	2	0	0
Dark-eyed Junco	88	120	410	191	102	195	127	698	531	46	361	226	199	90
Snow Bunting	25	0	0	0	60	0	0	12	0	0	34	45	0	0
Red-winged Blackbird	0	0	0	0	0	0	0	3	1	0	2	1	0	2
Common Grackle	0	0	1	0	2	0	0	2	8	0	10	3	2	0
Purple Finch	0	11	23	11	32	27	19	54	47	0	32	35	24	4
House Finch	0	20	30	46	0	1	31	74	0	0	0	4	0	3
Common Redpoll	0	0	0	0	0	0	6	10	0	0	0	0	0	0
Pine Siskin	16	0	14	25	3	2	8	29	2	0	21	14	2	0
American Goldfinch	71	259	76	70	223	72	105	174	326	5	156	323	41	10
Evening Grosbeak	0	0	0	0	0	0	0	4	0	0	6	0	0	0
House Sparrow	574	2134	724	437	622	22	361	1350	1692	95	655	1622	275	339
Total Species	29	38	39	35	36	34	45	73	50	25	47	55	35	35

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

Table 6. Number of each species in south-central Wisconsin found on 19 or more counts.

Species	57 Green Lake	58 Randolph	59 Horicon Marsh	60 Kettle Moraine	61 Poynette	62 Columbus	63 Hartford	64 Oconomowoc	65 Madison	66 Fort Atkinson	67 Burlington	68 Cooksville	69 Beloit	70 Lake Geneva
Great Blue Heron	0	0	0	0	1	0	1	1	2	2	1	3	2	1
Canada Goose	40000	5421	19000	0	102	2039	52	764	669	125	257	12	792	4786
American Black Duck	7	0	0	0	21	7	0	37	36	5	3	7	5	0
Mallard	245	0	3	0	306	150	34	766	4281	82	866	50	637	438
Common Goldeneye	112	0	0	2	18	0	0	5	176	0	28	6	1	345
Common Merganser	47	0	0	0	49	0	0	0	457	0	0	0	0	277
Bald Eagle	0	0	0	0	1	0	0	0	2	0	0	0	1	1
Northern Harrier	2	0	4	*	0	0	0	3	1	1	2	0	1	0
Sharp-shinned Hawk	*	0	0	1	2	0	1	2	6	0	2	1	*	0
Cooper's Hawk	*	0	0	*	3	2	0	2	9	1	1	*	*	3
Northern Goshawk	0	0	0	1	0	0	1	0	2	0	0	0	0	0
Red-tailed Hawk	20	5	24	13	52	10	38	37	62	21	30	4	15	28
Rough-legged Hawk	36	0	11	2	10	1	1	9	11	2	3	0	2	1
American Kestrel	12	4	9	3	28	11	36	34	14	5	18	17	12	40
Ring-necked Pheasant	10	0	7	0	6	1	1	5	4	6	2	4	5	8
Ruffed Grouse	1	0	0	0	9	0	0	0	0	0	0	0	0	0
Wild Turkey	2	0	0	38	45	0	0	*	0	0	0	0	0	0
Ring-billed Gull	4	0	0	157	2	0	0	0	456	14	26	0	4	19
Herring Gull	21	0	7	0	0	0	0	0	669	0	0	0	0	83
Rock Dove	237	78	337	118	675	179	570	492	1046	176	135	149	148	781
Mourning Dove	211	69	206	71	446	81	466	267	470	36	326	35	6	197
Eastern Screech-Owl	0	0	0	0	8	0	3	*	49	0	3	6	2	1
Great Horned Owl	3	0	5	1	13	1	7	1	9	2	16	2	2	13
Barred Owl	2	0	2	0	4	0	3	0	0	0	0	0	0	0
Belted Kingfisher	1	0	0	0	3	0	1	3	6	2	1	1	0	0
Red-headed Woodpecker	7	0	0	0	24	1	1	0	1	1	1	0	0	5
Red-bellied Woodpecker	14	1	3	6	68	5	8	9	44	2	5	2	2	30
Downy Woodpecker	46	2	13	14	115	19	72	55	156	16	57	38	39	57
Hairy Woodpecker	18	2	7	4	30	8	10	13	49	3	14	6	10	13
Northern Flicker	0	0	0	1	17	0	1	1	6	0	0	0	0	0
Pileated Woodpecker	2	0	0	2	9	0	0	0	*	0	0	0	0	0
Horned Lark	0	84	151	6	7	0	34	2	13	30	0	4	38	82
Blue Jay	96	35	33	31	917	55	81	58	228	24	101	51	57	97
American Crow	136	17	17	144	820	134	460	189	2175	146	83	96	304	269
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	146	9	60	69	513	29	234	193	643	60	141	45	125	237
Red-breasted Nuthatch	8	0	0	3	18	2	0	4	9	3	1	0	3	12
White-breasted Nuthatch	57	4	7	12	175	13	79	57	150	13	25	11	28	70
Brown Creeper	3	0	2	5	11	6	*	0	42	0	1	1	1	5
Golden-crowned Kinglet	7	0	0	4	2	0	0	0	17	0	1	0	0	0
American Robin	*	0	0	1	3	1	1	7	41	1	2	0	1	1
Cedar Waxwing	17	0	0	0	205	0	0	0	20	1	22	0	19	0
Northern Shrike	*	0	1	*	0	0	2	1	0	0	2	0	0	0
European Starling	111	314	276	356	2064	641	1653	1216	2858	49	935	231	238	1333
Northern Cardinal	43	3	22	15	178	22	93	115	373	25	63	43	102	95
American Tree Sparrow	109	65	0	39	872	54	382	365	588	111	848	140	156	269
Song Sparrow	0	0	1	0	7	7	0	3	11	3	8	2	3	4
White-throated Sparrow	0	0	0	0	5	0	0	0	34	0	0	1	0	32
Dark-eyed Junco	154	63	24	77	829	146	235	271	1008	91	285	141	391	402
Snow Bunting	0	42	123	0	0	0	0	0	0	0	0	0	0	0
Red-winged Blackbird	0	0	519	0	3	0	4	9	1458	0	2	2	0	0
Common Grackle	0	0	1	1	1	1	0	1	54	1	0	2	0	0
Purple Finch	19	2	2	26	190	5	11	45	29	5	3	5	16	13
House Finch	0	1	0	5	168	51	12	15	404	*	14	11	56	17
Common Redpoll	2	0	0	0	33	0	0	12	1	0	0	0	0	4
Pine Siskin	0	0	0	10	10	2	0	1	74	0	0	0	0	121
American Goldfinch	79	130	38	20	345	60	74	149	224	0	14	40	89	139
Evening Grosbeak	0	0	0	0	0	0	0	0	0	0	1	0	0	0
House Sparrow	277	377	1106	338	2691	1071	786	1382	4949	191	610	263	1026	1194
Total Species	48	23	37	35	72	35	39	51	80	38	47	37	41	57

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

Table 7. Number of each species in southern Lake Michigan counties found on 19 or more counts.

Species	71 Woodland Dunes NE	72 Woodland Dunes SE	73 Plymouth	74 Riveredge	75 Milwaukee	76 Hales Corners	77 Racine	78 Kenosha	Number of Counts	Total Birds	Percent Change
Great Blue Heron	0	0	0	0	1	0	0	0	22	38	+331%
Canada Goose	0	156	100	1631	651	918	436	340	42	72501	+4%
American Black Duck	0	89	8	15	36	0	37	15	33	896	-36%
Mallard	69	510	257	400	388	237	585	127	52	20680	-15%
Common Goldeneye	16	58	0	123	162	16	267	2	38	2799	-17%
Common Merganser	4	32	0	41	6	0	47	*	20	3779	+29%
Bald Eagle	0	0	0	0	0	0	0	0	40	416	+47%
Northern Harrier	0	0	0	5	*	0	6	0	25	66	+16%
Sharp-shinned Hawk	0	0	*	9	1	1	0	0	26	54	+35%
Cooper's Hawk	1	0	0	4	4	1	0	0	25	57	+85%
Northern Goshawk	0	0	0	2	0	0	0	0	21	30	+4%
Red-tailed Hawk	7	3	15	78	15	12	26	1	66	187	+28%
Rough-legged Hawk	2	0	5	7	2	3	5	*	64	571	+63%
American Kestrel	5	12	5	62	2	3	17	1	58	682	+52%
Ring-necked Pheasant	2	0	0	17	5	5	1	3	39	154	-50%
Ruffed Grouse	8	4	0	3	0	0	0	0	45	277	-32%
Wild Turkey	0	2	72	14	0	0	0	0	21	1164	+159%
Ring-billed Gull	1	68	57	679	440	63	655	21	24	4208	+25%
Herring Gull	1504	221	11	275	252	0	88	1	25	15355	+68%
Rock Dove	31	107	121	1133	218	78	84	14	64	20664	-2%
Mourning Dove	197	215	40	1023	189	86	186	25	57	9753	+4%
Eastern Screech-Owl	0	0	0	12	3	3	1	0	20	114	-22%
Great Horned Owl	2	5	0	28	5	5	*	*	55	239	-10
Barred Owl	1	2	1	9	0	0	0	0	32	69	-7%
Belted Kingfisher	1	1	0	2	0	1	1	0	25	51	-15%
Red-headed Woodpecker	0	1	0	4	0	0	0	*	34	188	+3%
Red-bellied Woodpecker	3	1	14	47	2	1	1	0	68	898	+13%
Downy Woodpecker	20	15	37	225	41	14	24	3	78	2763	+2%
Hairy Woodpecker	9	5	10	78	16	4	3	0	77	1128	-19%
Northern Flicker	0	0	*	9	1	3	3	*	24	78	-31%
Pileated Woodpecker	0	0	0	1	0	0	0	0	44	159	+4%
Horned Lark	0	6	1	86	0	0	32	*	34	965	-34%
Blue Jay	28	39	43	297	12	11	10	1	78	9038	-3%
American Crow	30	169	173	817	519	62	318	9	78	18649	-9%
Common Raven	0	0	0	0	0	0	0	0	23	486	-17%
Black-capped Chickadee	113	151	73	1247	190	47	63	7	78	16228	-6%
Red-breasted Nuthatch	3	0	4	23	7	0	4	0	56	729	-6%
White-breasted Nuthatch	22	32	28	262	27	15	8	0	77	3208	-10%
Brown Creeper	1	0	1	9	0	0	0	*	48	173	-12%
Golden-crowned Kinglet	2	2	0	5	5	2	0	0	25	117	-38%
American Robin	0	0	0	8	69	1	2	*	28	182	-50%
Cedar Waxwing	0	0	0	29	22	0	0	0	19	479	-67%
Northern Shrike	2	0	2	5	1	0	0	0	46	128	-15%
European Starling	358	434	100	2193	492	239	792	11	76	33628	-70%
Northern Cardinal	26	30	51	359	123	46	65	4	71	4972	+7%
American Tree Sparrow	25	34	36	579	129	53	10	0	68	9071	-37%
Song Sparrow	0	1	1	7	2	3	2	0	28	115	-39%
White-throated Sparrow	0	3	0	4	3	0	11	0	23	133	+133%
Dark-eyed Junco	68	63	148	866	228	47	153	3	74	11311	-40%
Snow Bunting	0	0	0	0	0	0	50	0	32	5148	-12%
Red-winged Blackbird	3	0	0	1	0	1	0	*	19	2028	-29%
Common Grackle	0	0	2	8	0	1	2	*	34	156	-51%
Purple Finch	6	10	46	60	0	8	6	2	67	1721	+36%
House Finch	23	128	11	181	139	9	225	2	47	2196	+128%
Common Redpoll	0	12	0	3	2	0	0	0	45	4893	+71%
Pine Siskin	28	18	16	41	13	0	5	0	52	1178	-69%
American Goldfinch	54	63	73	407	119	15	68	4	73	6592	-43%
Evening Grosbeak	0	0	0	0	0	0	0	0	30	1886	-71%
House Sparrow	77	315	407	2420	507	167	538	6	75	50258	-17%
Total Species	39	43	37	72	64	39	56	27			

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

Table 8. Species found on 18 or fewer counts.

Species	Number of Counts	Number of Birds	Count and Number
Common Loon	2	3	Green Lake 2, Madison 1
Pied-billed Grebe	2	3	Madison 2, Milwaukee 1
Double-crested Cormorant	4	14	Green Bay 9, Appleton 3, Riveredge 1, Racine 1
Tundra Swan	4	25	Bayfield 2, Adams 1, Poynette 1, Madison 21
Trumpeter Swan	2	2	Sauk City 1, Green Lake 1
Mute Swan	6	15	Stevens Point 2, Shawano 2, Oconomowoc 2, Madison 7, Burlington 1, Milwaukee 1
Snow Goose	1	1	Appleton 1
Wood Duck	10	15	Caroline 1, Wautoma 2, Stockbridge 2, LaCrosse 1, Poynette 2, Oconomowoc 1, Madison 1, Lake Geneva 2, Racine 2, Kenosha 1
Northern Pintail	3	4	Poynette 1, Madison 2, Plymouth 1, (Kenosha)
Northern Shoveler	1	157	Madison 157
Gadwall	8	271	Sauk City 1, Green Lake 7, Poynette 2, Madison 240, Fort Atkinson 5, Cooksville 10, Beloit 5, Milwaukee 1
American Wigeon	5	11	Appleton 2, Oconomowoc 1, Madison 5, Lake Geneva 1, Milwaukee 2
Canvasback	7	25	Ephraim 1, Appleton 1, Green Lake 3, Oconomowoc 2, Madison 1, Lake Geneva 1, Racine 16, (Kenosha)
Redhead	3	6	Green Bay 1, Madison 3, Milwaukee 2, (Kenosha)
Ring-necked Duck	6	12	Green Bay 2, Fremont 1, Oconomowoc 2, Madison 1, Lake Geneva 3, Riveredge 3
Greater Scaup	7	571	Ephraim 9, Green Bay 2, Woodland Dunes SE 1, Riveredge 3, Milwaukee 303, Racine 251, Kenosha 2
Lesser Scaup	5	174	Green Bay 12, Green Lake 2, Madison 14, Lake Geneva 142, Racine 4
scaup species	1	4	Oshkosh 4
Harlequin Duck	1	1	Milwaukee 1
Osage	7	116	Ephraim 86, Green Lake 1, Riveredge 14, Milwaukee 6, Hales Corners 5, Racine 1, Kenosha 3
Bufflehead	10	370	Peshigo 8, Ephraim 17, Oshkosh 2, Sauk City 1, Madison 38, Lake Geneva 22, Milwaukee 144, Hales Corners 5, Racine 132, Kenosha 1
Hooded Merganser	11	24	Hudson 1, Chippewa Falls 1, Appleton 1, (LaCrosse), Green Lake 1, Horicon Marsh 1, Oconomowoc 1, Madison 1, Lake Geneva 13, Plymouth 1, Riveredge 1, Milwaukee 2, (Kenosha)
Red-breasted Merganser	7	430	Fremont 1, Lake Geneva 7, Woodland Dunes SE 1, Riveredge 65, Milwaukee 258, Racine 96, Kenosha 2
Ruddy Duck	5	5	Appleton 1, Madison 1, Lake Geneva 1, Woodland Dunes SE 1, Milwaukee 1, (Kenosha)
Turkey Vulture	1	1	Fond du Lac 1
Red-shouldered Hawk	6	7	Sauk City 1, Bridgeport 1, Poynette 2, Hartford 1, Oconomowoc 1, Madison 1, (Milwaukee)
Golden Eagle	4	6	Spruce 1, Pensaukee 1, Kickapoo Valley 2, Bridgeport 2
Merlin	1	1	Spencer 1
Peregrine Falcon	4	6	Bridgeport 1, Madison 2, Milwaukee 1, Racine 2, (Kenosha)
Gray Partridge	6	88	Hofa Park 8, Pensaukee 4, Green Bay 17, Appleton 6, Bridgeport 45, Poynette 8
Spruce Grouse	1	1	Three Lakes 1
Greater Prairie-Chicken	2	34	Spencer 27, Stevens Point 7
Sharp-tailed Grouse	1	1	Medford 1
Northern Bobwhite	7	94	Medford 6, Wautoma 27, Richland Center 50, Bridgeport 1, Platteville 5, Poynette 2, Beloit 3
Virginia Rail	1	1	Poynette 1
American Coot	12	604	Ephraim 3, Green Bay 1, Fremont 1, Appleton 1, Sauk City 1, Green Lake 7, Oconomowoc 10, Madison 268, Lake Geneva 301, Riveredge 1, Milwaukee 9, Racine 1, (Kenosha)
Sandhill Crane	1	1	Racine 1
Common Snipe	12	23	New Richmond 2, Hofa Park 3, Durand 1, Kickapoo Valley 2, LaCrosse 1, Sauk City 1, Richland Center 1, Mount Horeb 2, Bridgeport 2, Poynette 2, Madison 5, Lake Geneva 1
Bonaparte's Gull	1	22	Racine 22, (Kenosha)
Thayer's Gull	1	1	Sauk City 1
Glaucous Gull	3	3	Green Bay 1, (Oshkosh), Sauk City 1, Riveredge 1
Greater Black-backed Gull	2	2	Oshkosh 1, Sauk City 1
Snowy Owl	12	18	Bayfield 1, Ashland 5, Grantsburg 1, (Ephraim), Medford 1, (Spencer), Shawano 1, Hofa Park 2, Pensaukee 1, Green Bay 2, Shiocton 1, (Oshkosh), Randolph 1, (Madison), Woodland Dunes SE 1, Milwaukee 1
Long-eared Owl	5	7	(Spruce), Sauk City 1, Richland Center 1, Bridgeport 1, Poynette 3, Riveredge 1
Short-eared Owl	3	4	(Spruce), Madison 1, Burlington 1, Riveredge 1
Northern Saw-whet Owl	3	3	Pensaukee 1, Adams 1, Poynette 1
Yellow-bellied Sapsucker	6	8	Nelson 1, Baraboo 1, Poynette 1, (Madison), Plymouth 1, Riveredge 3, Milwaukee 1, (Kenosha)
Black-backed Woodpecker	1	4	Phelps 4
Gray Jay	6	101	Oxbo 7, Fifield 16, Phelps 7, Three Lakes 47, Rhinelander 21, Medford 3
Boreal Chickadee	2	6	Phelps 1, Three Lakes 5
Tufted Titmouse	15	129	Chippewa Falls 11, Willard 1, Black River Falls 10, Kickapoo Valley 1, Sauk City 8, Richland Center 9, Mount Horeb 10, Bridgeport 26, Platteville 14, Blanchardville 4, Poynette 27, Oconomowoc 3, Cooksville 2, Beloit 2, Milwaukee 1
Carolina Wren	5	7	Three Lakes 1, Madison 1, (Lake Geneva), Riveredge 2, Milwaukee 1, Racine 2
Winter Wren	6	6	Appleton 1, Woodland Dunes NW 1, Kickapoo Valley 1, Woodland Dunes NE 1, Woodland Dunes SE 1, Riveredge 1
Marsh Wren	1	1	Poynette 1
Ruby-crowned Kinglet	1	3	Appleton 3
Fox Sparrow	7	15	Owen 1, Stevens Point 4, Appleton 1 (Trempealeau), Baraboo 1, Madison 3, Lake Geneva 4, Milwaukee 1

continued

Table 8. (Continued)

Species	Number of Counts	Number of Birds	Count and Number
Eastern Bluebird	3	7	Peshigo 4, Fremont 1, Poynette 2
Hermit Thrush	2	3	Sauk City 1, Milwaukee 2
Varied Thrush	2	2	Gilman 1, Madison 1
Gray Catbird	1	1	Hartford 1
Northern Mockingbird	1	1	Riveredge 1
Brown Thrasher	4	4	LaCrosse 1, (Green Lake), Poynette 1, Madison 1, Woodland Dunes NE 1
Bohemian Waxwing	6	110	Bayfield 2, Ashland 81, Peshigo 3, Spencer 2, (Wausau), Stevens Point 2, Shawano 20, (Fort Atkinson)
Yellow-rumped Warbler	2	2	Richland Center 1, Milwaukee 1
Rufous-sided Towhee	2	2	Mount Horeb 1, (Madison), Lake Geneva 1, (Racine)
Chipping Sparrow	1	1	Columbus 1
Field Sparrow	2	14	Beloit 1, Lake Geneva 13
Savannah Sparrow	1	2	Riveredge 2
Swamp Sparrow	9	38	Sauk City 6, Blanchardville 2, Poynette 6, Madison 5, Fort Atkinson 4, Burlington 4, Riveredge 9, Milwaukee 1, Hales Corners 1, (Kenosha)
White-crowned Sparrow	3	12	Wautoma 4, Burlington 6, (Beloit), Racine 2
Lapland Longspur	7	374	Hofa Park 2, Appleton 10, Oshkosh 3, Stockbridge 43, Bridgeport 91, Horicon Marsh 223, Poynette 2
Eastern Meadowlark	1	1	(Spruce), Columbus 1
meadowlark spp.	3	16	Madison 1, Lake Geneva 1, Riveredge 14
Rusty Blackbird	5	36	Sauk City 1, Richland Center 1, Horicon 1, Madison 31, Fort Atkinson 2
Brewer's Blackbird	2	9	LaCrosse 1, Horicon Marsh 8
Brown-headed Cowbird	13	515	Amherst 1, Shiocton 1, Appleton 1, Oshkosh 2, Woodland Dunes SW 20, Nelson 1, Richland Center 12, Mount Horeb 10, Horicon Marsh 58, Poynette 1, Madison 347, Lake Geneva 60, Racine 1
Pine Grosbeak	15	248	Bayfield 3, Ashland 25, Gurney 14, Oxbow 19, Fifield 18, Phelps 18, Three Lakes 66, Rhinelander 1, Medford 13, Owen 1, Stevens Point 8, Horicon Marsh 58, Poynette 2, Hartford 1, Riveredge 1
Red Crossbill	3	13	Sauk City 10, Bridgeport 2, Oconomowoc 1
White-winged Crossbill	5	32	Phelps 9, Three Lakes 17, Lakewood 3, Gilman 2, (Wausau), Sauk City 1
Hoary Redpoll	1	2	Green Bay 2

were less numerous. Numbers of Oldsquaws have declined greatly in recent years. Rarities included a Harlequin Duck at Milwaukee, the tenth Christmas Count record, and 14 Double-crested Cormorants, which was slightly below last year's record high, and is the result of successful efforts to save this once threatened species. Common Loons were reported on counts at Green Lake (2) and Madison. The 15 Mute Swans on 6 counts was the lowest total since 1983, but it may reflect the absence of the Waukesha Count, which reported 47 of last year's record total. Green-winged Teal were not found for the second consecutive year.

Hawks and Eagles—The large numbers of hawks and eagles was a highlight of the 1991 Counts; all species occurred in above normal numbers. Record numbers of Red-tailed Hawks, Rough-legged Hawks, and American

Kestrels were observed, and the number of Cooper's Hawks was only two short of last year's record total. Counts of Bald Eagles and Sharp-shinned Hawks were 47% and 35% above normal, respectively. Only the Northern Harrier (+16%) and Northern Goshawk (+4%) appeared in only slightly increased numbers. The six Peregrine Falcons on four counts was unprecedented; never before had more than one been found on Wisconsin Christmas Counts. Other highlights were six Golden Eagles on four counts and a Merlin at Spencer. Two other Merlins were reported, but not included because the documentation was not convincing.

Grouse, Pheasants, Quail, etc.—Probably because of a lack of snow cover, which made it more difficult to see these species, numbers of all of them were well below last year. Compared

to the previous 10 years, counts of Gray Partridges were down 70%, Ring-necked Pheasants were down 50%, and Ruffed Grouse were down 32%. The latter is surprising because counts of Ruffed Grouse are normally higher in years with little snow. Numbers of Northern Bobwhite were about normal after record numbers last year, and Wild Turkey counts declined somewhat, but were still 159% above the average for the previous 10 years.

Gulls and Other Waterbirds—The record number of Great Blue Herons (38 on 22 counts) was certainly a high-light; 24 were found in 1986, but usually only a few counts find this species. Favored by much open water, Herring Gulls (+68%) and Ring-billed Gulls (+25) were more abundant than usual. However, numbers of Common Snipe were the lowest since 1982, and Kill-deers were not seen for the second year in a row and for only the second time in 27 years, probably because the severe cold in early November forced them to migrate south. Among rarer species, there were Glaucous Gulls on three counts, 22 Bonaparte's Gulls at Racine, a Thayer's Gull at Sauk City, Great Black-backed Gulls on two counts, and a Virginia Rail at Poynette.

Doves—Rock Doves and Mourning Doves occurred in about normal numbers.

Owls—The 18 Snowy Owls were the most since 1981 and represent a substantial increase over recent years. Counts of Screech Owls, Great Horned Owls, and Barred Owls were all somewhat below normal, probably because windy conditions on the first weekend of the count period made

owl-listening less productive. Counts of Long-eared Owls were also low, and the four Short-eared Owls is the lowest total since 1982. Three Northern Saw-whet Owls were found, which is the highest number since 1985.

Woodpeckers—The Red-bellied Woodpecker, whose population seems to continually expand, was the only species to occur in above normal numbers (+13%). In spite of a very heavy acorn crop, which usually induces Red-headed Woodpeckers to overwinter, their numbers were about normal. Counts of Downy Woodpeckers and Pileated Woodpeckers and Yellow-bellied Sapsuckers were also near normal, but those of Hairy Woodpeckers and Northern Flickers were distinctly low. The four Black-backed Woodpeckers at Phelps was exceptional; that many had not been seen on Wisconsin Christmas Counts since 1976.

Jays, Crows, Chickadees, Nuthatches, etc.—Numbers of all of the common species were slightly below normal, except the Northern Raven, which was 17% below normal. Tufted Titmouse populations remained high for the third consecutive year. The 101 Gray Jays was a record total, eclipsing the 1989 record of 71.

Creepers, Kinglets, Wrens, and Warblers—Counts of Brown Creepers and Golden-crowned Kinglets were down, especially the latter, while Winter Wren numbers were about average. Carolina Wrens occurred in record numbers, with seven on five counts. One was found as far north as Three Lakes. Other noteworthy observations were three Ruby-crowned Kinglets at Appleton and Yellow-rumped War-

blers at Richland Center and Milwaukee.

Thrushes, Shrikes, and Waxwings—Counts of American Robins and Cedar Waxwings were well below normal and those of Northern Shrikes were slightly below normal. Only small numbers of Bohemian Waxwings were found, mostly in the north. Counts of Hermit Thrushes and Eastern Bluebirds were a little low, with the latter being found at Peshtigo, Fremont, and Poynette. Varied Thrushes were seen at Gilman and Madison, a Gray Catbird was found at Hartford, and a Mockingbird was observed at Riveredge.

Sparrows—Numbers of American Tree Sparrows, Dark-eyed Juncos, and Song Sparrows were well below normal, while White-throated Sparrows occurred in record numbers. Field Sparrows, Fox Sparrows, Swamp Sparrows, and White-crowned Sparrows appeared in about normal numbers, but totals for Rufous-sided Towhees were distinctly low. A Chipping Sparrow at Columbus and two Savannah Sparrows at Riveredge were exciting discoveries.

Open Country Birds—A lack of snow cover over much of the state to force these open country species to roadsides caused totals of Horned Larks to be well below normal. Lapland Longspur and Snow Bunting counts were somewhat low, while counts of meadowlarks were about normal.

Blackbirds—Counts of Red-winged Blackbirds and Common Grackles were about normal. The total of Brown-headed Cowbirds was the highest since 1981, mostly due to the large

number found at Madison. Brewer's Blackbirds were found at LaCrosse and Horicon Marsh.

Finches—Except for the Common Redpoll, whose numbers were 71% above average, the flight of winter finches was dismal. When compared with the previous 10 years, counts of Evening Grosbeaks were down 71%, Pine Siskins were down 69%, Pine Grosbeaks were down 60%, Purple Finches were down 51%, and American Goldfinches were down 43%. White-winged Crossbills were found on only five counts, and only 13 Red Crossbills were reported; this was the lowest number since 1978. Populations of House Finches continued to increase and spread throughout the state. Christmas Counts of this species since it first appeared in 1986 are: 1986—6, 1987—36, 1988—108, 1989—617, 1990—925, and this year 2196. It has become one of our more common and widespread species, with reports from as far north as Ashland, Spruce, and Ephraim. The discovery of two Hoary Redpolls at Green Bay was a plus.

In summary, the 1991 Wisconsin Christmas Bird Counts produced excellent counts of hawks, eagles, and some water birds, but most other species were at or below normal numbers. If you wish to participate in a count in 1992, 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 to obtain a report form.

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Status of the Common Loon in Wisconsin

The status of the Common Loon in Wisconsin was first documented in 1976–77 at which time the population was estimated at 1300 adults and 258 chicks. In 1985, LoonWatch conducted a random sample survey designed to be repeated every five years. The 1985 population estimate was 2334 adults and 626 chicks. In 1990 the survey was replicated and the population estimate was 2790 adults and 725 chicks. Due to an update in the state's official list of lakes, the 1985 estimate was recalculated at 2829 adults and 626 chicks. Results from the 1990 survey suggest a stable loon population between 1985 and 1990.

by Terry Daulton Dunn

The Common Loon (*Gavia immer*) is a species which attracts the attention of both the general public and scientific community. It's charismatic appearance and calls have established the Common Loon as a symbol of the wilderness, and on northern lakes this bond has created a strong public interest in loon preservation. Their position at an upper level in the aquatic food chain and specific habitat requirements make the loon vulnerable to the impacts of human activities. Examples include shoreline development and recreational use of lakes (McIntyre 1975); and the toxic effects of environmental contaminants (Belant and Anderson 1990). These same characteristics have led to the use of the Com-

mon Loon as an indicator of aquatic health by a number of resource management agencies. Concern has been expressed over population declines throughout the species range in North America (McIntyre 1988).

The Status of Wisconsin's Common Loon was initially documented in 1976–77. The population was estimated at 1300 adults and 258 juveniles (Zimmer 1982). Zimmer conducted land or aerial surveys of all lakes over 30 acres in 20 northern Wisconsin counties. In 1985, LoonWatch, a research and education program of the Sigurd Olson Environmental Institute of Northland College, developed and coordinated a random sample baseline data survey designed to be repeated on

a 5-year basis. The first LoonWatch survey and population estimate indicated a 1985 summer population of 2334 ± 197 adults and 491 ± 98 juveniles (Olson 1986). Although Zimmer's methods were substantially different from the 1985 survey methods, a comparison of results by Strong (1988) stated a 78 and 90 percent increase in adults and young, respectively, between 1976 and 1985. Comparison of the 1976–77 and 1985 lake use patterns by loons on 173 lakes also suggested population growth. Only three lakes which had productive loon pairs present in 1976–77 had no loons present in 1985, while 19 lakes which had no loons present in 1976–77 had productive pairs in 1985 (Strong 1988).

The 1985 survey goals were to: determine the population of Common Loons in Wisconsin, evaluate the use of citizen volunteer surveys as census techniques, develop an inexpensive standardized technique to determine the year-to-year population trends of Common Loons, to determine some habitat preferences of Common Loons, and begin baseline documentation of the effects of human disturbances on loon populations (Olson 1986). This paper presents the results of the 1990 five-year survey and compares it with previous estimates.

METHODS

Methodology followed the 1985 survey as closely as possible. Slight changes were made in sample size and organization, and in statistical analysis so that the data could be compared with 1985 results and with a similar Common Loon population survey conducted in Minnesota in 1989 by LoonWatch and the Minnesota De-

partment of Natural Resources (MN DNR). Two major differences between the 1985 Wisconsin survey and the Minnesota survey were the number of lake size classes (13 in the Wisconsin survey and four in the Minnesota survey) and the inclusion of lakes between 10 and 25 acres in the Minnesota survey (Strong and Baker 1991). In the 1990 Wisconsin survey the lake size classes were reformed into four categories but lakes between 10 and 25 acres were not included in the data set.

In 1985, a stratified sample of 248 Wisconsin lakes were randomly selected from 28 northernmost counties. These counties constitute the major range for nesting loons in the state. The sample was cross-stratified by lake size and county to insure an adequate variety of lakes. Thirteen lake size classes ranging from 25 to over 2000 acres were developed. Of the 248 lakes, 184 were sampled in 27 counties. Survey volunteers were recruited from a list of "loon rangers" who annually monitor loon activity as part of the LoonWatch program. Volunteers were sent detailed instructions, a data form, and a lake map. The survey was conducted on July 6, 1985 between 0500 and 1000h CDST. This date was selected so that loon chicks would be in family groups and would be conspicuous enough for easy observation. The limited time period was selected to take advantage of potential calm winds and waves and to reduce the chance of duplicate observations due to movement of birds. Twenty-four lakes were cross-checked by two observers to assess volunteer accuracy. If duplicate data for a lake was not the same, the larger count was recorded on the premise that it was more likely to miss a loon than to over-count. Lake data were

summarized and mean number of loons per lake, standard deviation, and variance were calculated. The mean was then multiplied by the total number of lakes in the sample to obtain the population estimate. The same calculations were repeated for the chick estimate (Olson 1986).

All lakes surveyed in the 1985 census were included in the 1990 sample. A number of additional lakes were randomly selected in order to address the following sample design factors: (1) the number of lakes over 500 acres was increased to more accurately represent the varied characteristics of large lakes in the sample area as suggested by Olson (1986), (2) the sample size was increased to reflect the update in Wisconsin's official list of lakes in the survey area (from 2457 lakes in 1985 to 2891 in 1990), (3) four size classes (25–49 acres, 50–149 acres, 150–499 acres and lakes over 500 acres) were created following the model used in the 1989 Minnesota survey and new lakes were added to reach the 15% confidence interval in each size class. The size class modification will facilitate comparison of Wisconsin and Minnesota survey data while retaining the ability to recreate the original 13 classes. 65 lakes were added to the sample bringing the total to 256.

Volunteers from the 1985 survey were contacted and assigned to the same lake. Additional volunteers were solicited to survey the remaining lakes. When possible, natural resource agency personnel were assigned to lakes over 500 acres. In total, 214 volunteers, who are listed in the Acknowledgements, participated in the survey.

July 14 (from 0500 to 1000h CDST) was selected for the survey, with July 21 held as a rain date. Some agency

personnel who could not work on the July 14 were allowed to count on alternative dates within a week of the selected date.

Statistical analysis of the data was conducted by personnel in the Wisconsin Department of Natural Resources Bureau of Research (WDNR). Mean, variance, and standard deviation were calculated for each lake size class, the total loon population, and for loon chicks. Geographic distribution of adult loons was computed and the 1985 population data were recalculated using the updated list of lakes in the WDNR master file.

RESULTS AND DISCUSSION

Distribution—The 1990 summer population estimate for Common Loons in Wisconsin was 2790 ± 235 (16.8% confidence interval) (Table 1). The re-calculated 1985 estimate was 2829 ± 248 (17.5% confidence interval) (Table 2). Observers counted 229 adult loons during the 1990 survey. While the survey instrument is not sensitive enough to detect modest changes in the population, the results of the 1990 survey indicate relative stability in the adult Common Loon population during the 1985–90 period. Strong (1988) suggested that there was a substantial increase in the number of adult loons in Wisconsin between 1976–77 and 1985. This population growth did not appear between 1985–90.

Within the selected size classes, lakes over 500 acres had the greatest number of loons per lake (1.94) (Table 1, Figure 1). Lakes between 50–149 acres supported the largest portion (38%) of the adult population (Table 1, Figure 2) suggesting that these lakes are especially important to loons. Occu-

Table 1. 1990 Wisconsin adult Common Loon population.

Lake size class (acres)	Total no. of lakes in survey area	No. lakes surveyed	% lakes surveyed	No. with loons	% with loons	No. loons seen	Loons per lake	Estimated no. loons	Standard error	% of population
25-49.9	946	56	5.9	19	33.9	33	0.59	557.5	106.6	20
50-149.9	1090	73	6.7	37	50.7	71	0.97	1060.1	143.7	38
150-499.9	580	50	8.6	25	50.0	55	1.10	638.0	103.0	23
500+	275	36	13.1	18	50.0	70	1.94	534.7	112.3	19
Overall	2891	215	7.5	99	46.0	229	1.07	2790.3	235.0	

pancy rates were the lowest for lakes between 25-49 acres with about one-third of the lakes supporting at least one loon (Table 1, Figure 3). Approximately one-half of the lakes in the other three size classes were occupied. No loons were seen on 116 lakes, single loons were seen on 24 lakes, and two loons were recorded on 50 lakes.

Of the 25 counties with survey data; Barron, Burnett, Vilas, Oneida, and Sawyer counties had the largest percentage of lakes with loons (Table 3, Figure 4). Ashland and Bayfield counties and a number of southern counties had the lowest percentage of lakes with loons. On 99 lakes (44%) at least one loon was present.

The distribution of loons in the state may be related with habitat availability with those counties with many lakes and a history of loon use supporting the largest number of loons. Counties on the southern margin of the current range and those with low numbers of lakes support the fewest loons.

Productivity—The estimated number of chicks was 725 ± 116 in 1990 (Table 4) and the re-calculated value for 1985 was 626 ± 124 . Fifty-six chicks were recorded during the 1990 survey. Chicks were present on 17% of the survey lakes.

The average number of chicks per

lake was 0.26. The lakes between 50-149 acres played a significant role with 35% of the chick population found on this class (Figure 5).

Loons are long lived, faithful to nesting sites, and often continue to nest in unfavorable locations for a number of years (McIntyre 1974; Alvo 1985; Strong et al. 1987). Estimates of adult loon populations are less effective in assessing changes in population stability than are numbers of chicks (Strong 1988). The best time to measure productivity is from late July to early August when chicks have survived to fledging (Belant 1989). Al-

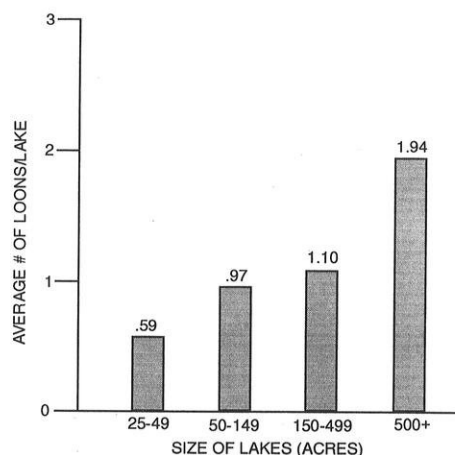


Figure 1. 1990 average number of loons seen per lake by lake size class.

Table 2. Revised 1985 Wisconsin adult Common Loon population.

Lake size class (acres)	No. lake surveyed	No. loons seen	Est. no. loons	Standard error	Loons per lake
25-49.9	56	43	726.39	136.32	0.76
50-149.9	66	70	1156.06	136.64	1.06
150-499.9	46	41	516.96	105.55	0.89
500+	16	25	429.69	114.19	1.56
Overall	184	179	2829.10	247.86	

though the LoonWatch survey is conducted in early July and does not reflect fledging success, it can be compared with other surveys during the same time period. The survey data suggests stable productivity between 1985 and 1990.

Characteristics of the Lake Size Classes—7.5% of the water bodies in the study area were surveyed (Table 1, Figure 6). Of the 256 lakes scheduled to be surveyed in the 1990 sample, data was received for 215 (90%). All counties except Menominee, Chippewa, and Clark had less than three unsampled lakes. The five Menominee County lakes in the sample were all assigned to one volunteer who failed to complete the survey. No volunteer was

found for the Clark County lakes or for seven Chippewa County lakes. The lakes which were not sampled were spread through the four lake size classes. Of the 41 unsampled lakes, the numbers in each lake size class were 16, 12, 6, 6 from the smallest size to the largest. Eight of the lakes not sampled were included in the 1985 survey. One lake surveyed in 1985 was dry in 1990 and subsequently was not sampled. The remaining 33 were lakes which were not sampled and were added during the 1990 size class adjustments.

The smallest lake in the 1985 survey was 25 acres. Some investigators cite 25 acres as a minimum lake size requirement for adult Common Loons (Sjolander and Agren 1972; McIntyre

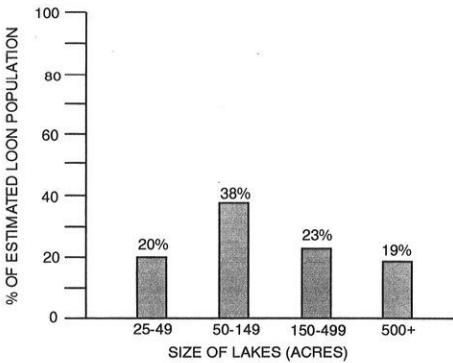


Figure 2. Percent of 1990 adult loon population occupying four lake size classes.

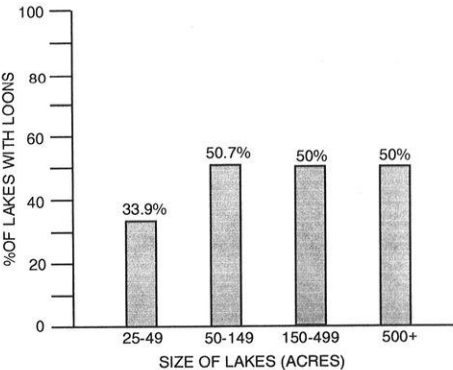


Figure 3. Percent of lakes with at least one adult loon observed in 1990.

Table 3. Lakes with loons by county 1990

County	No. lakes surveyed	No. with loons	% with loons
Ashland	6	0	0.0
Barron	4	4	100.0
Bayfield	14	3	21.4
Burnett	11	9	81.8
Chippewa	11	1	9.0
Clark (N.D.)	—	—	—
Douglas	6	3	50.0
Dunn	2	0	0.0
Florence	5	3	60.0
Forest	7	3	42.9
Iron	11	5	45.5
Langlade	5	3	60.0
Lincoln	5	3	60.0
Marathon	7	0	0.0
Marinette	4	1	25.0
Menominee	—	—	—
Oconto	8	1	12.5
Oneida	25	17	68.0
Polk	10	5	50.0
Price	8	4	50.0
Rusk	4	0	0.0
St. Croix	3	0	0.0
Sawyer	12	8	66.7
Shawano	6	0	0.0
Taylor	2	1	50.0
Vilas	25	18	72.0
Washburn	14	7	50.0
Total	215	99	46.0

1975). A study of small lake use in Crow Wing County in Minnesota showed 36% occupancy for lakes between 10–24 acres by loons (Perry 1987). In Wisconsin, Zimmer (1979) found that only 5 of 143 lakes (3.5%) less than 30 acres had loons. In Michigan, a 3% occupancy rate has been estimated for lakes between 10 and 40 acres (Robinson et al. 1987). While these results suggest low occupancy rates by loons on 10–25 acres lakes in Wisconsin, further investigation might be useful in light of Minnesota's higher occupancy rate.

Characteristics of the Sample—The 1990 sample revisions influenced the data in two ways. First, the larger num-

ber of lakes on the state list increased the 1985 population estimate. Secondly, the 1990 calculation methods differed from 1985 (see methods). The 1990 calculation by strata increased the number of loons in both the recalculated 1985 estimate and the 1990 figures by a small margin and is more accurate than the initial calculation method (P. Rasmussen, pers. comm.)

Observer Accuracy—Weather conditions during the survey were ideal with clear skies and calm winds occurring throughout the survey area. Ten volunteers used an alternative date for the survey, five observed outside the established time limit on the survey date, and 15 observed for less than 30 minutes.

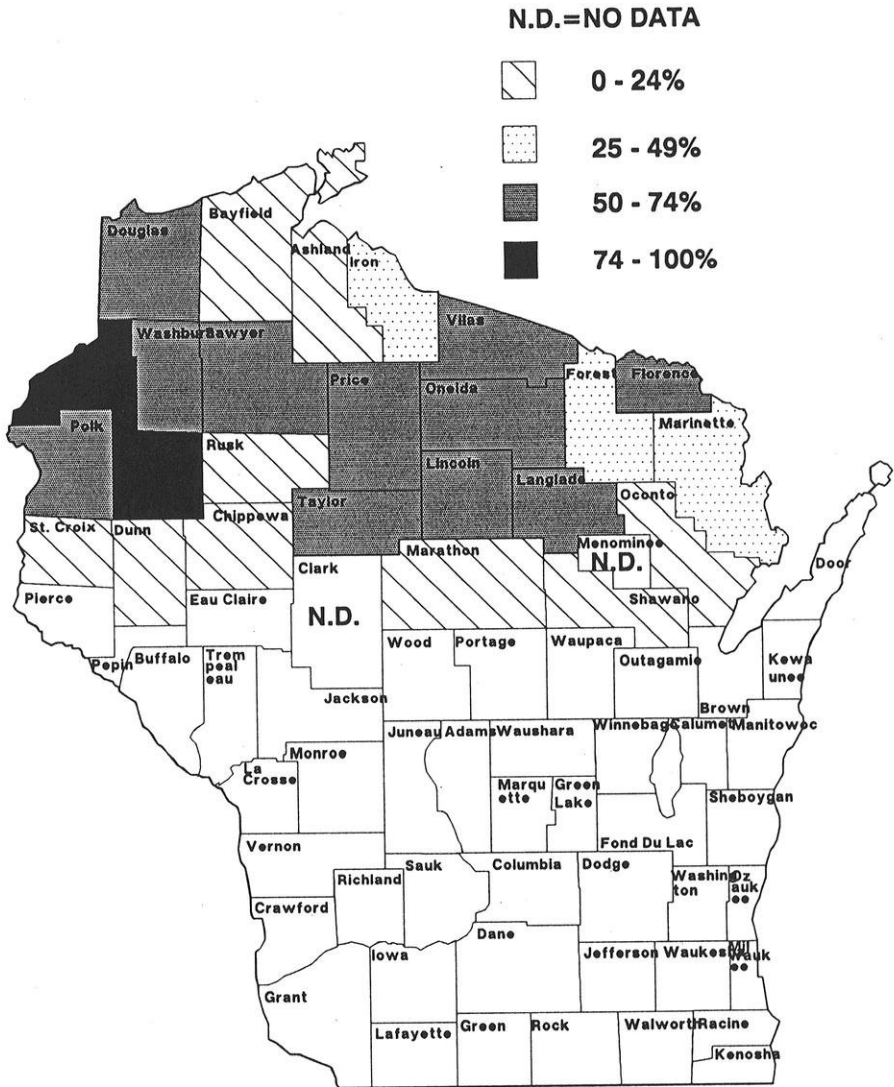


Figure 4. Percent of 1990 survey lakes with loons present.

In 1985, surveys were duplicated on 23 lakes with only four reports showing data discrepancies in the number of adult loons. Olson attributed two of these discrepancies to early or late observations within the designated time period. Based on this criteria, Olson suggested that immigration or emigra-

tion could have accounted for the observer difference and he eliminated these two reports. The remaining two lakes with discrepancies showed a difference of 3 adults (10.7% of the total number counted on cross-checked lakes). In 1990, 23 lakes were cross-checked with discrepancies found in

Table 4. 1990 Wisconsin Common Loon chick population.

Lake size class (acres)	Total no. of lakes in survey area	No. lakes surveyed	No. with chicks	% with chicks	No. chicks seen	Chicks per lake	Estimated no. chicks	Standard error	% of chick population
25-49.9	946	56	6	10.7	11	0.20	185.8	71.8	26
50-149.9	1090	73	12	16.4	17	0.23	253.8	69.7	35
150-499.9	580	50	13	26.0	18	0.36	208.8	52.0	29
500+	275	36	6	16.7	10	0.28	76.4	28.2	11

data from seven. Of these seven, four could be attributed to observations outside the established time period. The remaining three discrepancies showed a difference of five loons (11.6% of the total number counted on cross-checked lakes). Analysis of volunteer accuracy in Christmas bird counts found that discrepancies balance between under counted and over counted birds (Ralph and Scott 1981). In comparing volunteer accuracy in the Wisconsin Checklist Project, 178 errors were found in 22,829 bird check lists (0.79% error) (pers. comm., S. Temple). This suggests that volunteers can have a very high accuracy level. Further investigation into accuracy of LoonWatch volunteers, and

into ways for improving their success could maximize the accuracy of the LoonWatch survey. Due to volunteer effects, the results of the LoonWatch survey are most meaningful when compared to similar volunteer surveys.

CONCLUSIONS

This survey was designed to monitor the Common Loon population in Wisconsin on a long-term basis. Comparison of the 1990 population estimates for adult loons and chicks suggests that there has been no dramatic change in the population or productivity over

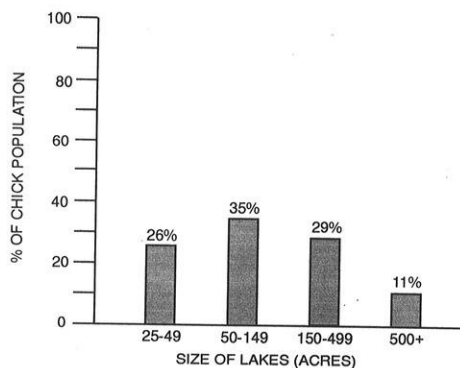


Figure 5. Percent of 1990 chick population occupying four lake size classes.

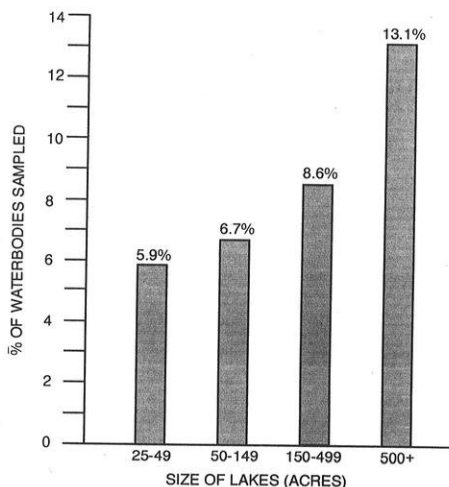


Figure 6. Percent of lakes sampled in 25 northern Wisconsin counties in 1990.

the last five years. The consistency in the 1985 and 1990 estimates seems to indicate that the growth trend between 1976-77 and 1985 stated by Strong (1988) has leveled off. The survey methods used by Zimmer (1979) in 1976-77 were substantially different from the LoonWatch survey methods. This should be considered when comparing the 1976-77 population estimate to the LoonWatch estimates.

The 1990 distribution of adult loons was similar to 1985 results. Counties with the largest number of lakes and a history of loon use supported the largest percent of the population. The 1990 survey data suggests that lakes between 50 and 149 acres are particularly important to loons, as 38% of all adults and 35% of chicks are found in this group. Suggestions for further study include investigation into LoonWatch volunteer accuracy, and evaluation of Common Loon occupancy rates on lakes between 10-25 acres.

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LITERATURE CITED

- Alvo, R. 1985. The breeding status of Common Loons (*Gavia immer*) in relation to lake alkalinity. M.Sc. thesis, Trent University, Peterborough, Ontario.
- Belant, J. L. 1989. Common Loon productivity and brood habitat use in northern Wisconsin. M.Sc. thesis, University of Wisconsin-Stevens Point. 48 pp.
- Belant, J. L. and R. K. Anderson. 1990. Environmental contaminants in Common Loons from northern Wisconsin. *Passenger Pigeon* 52:307-310.
- McIntyre, J. W. 1974. Territorial affinity of a Common Loon. *Bird Banding* 45:178.
- McIntyre, J. W. 1975. Biology and behavior of the Common Loon (*Gavia immer*) with reference to its adaptability in a man-altered environment. Ph.D. Thesis. Univ. Maine. 230 pp.
- McIntyre, J. W. 1988. The Minnesota report: a 15-year survey comparison. Pp. 118-130. In P. I. V. Strong (ed.). Papers from the 1987 conference on loon research and management. North American Loon Fund, Meredith, NH.
- Olson, D. L. 1986. The population and distribution of Common Loons (*Gavia immer*) in northern Wisconsin. M.Sc. thesis, University of Minnesota, Duluth. 50 pp.

- Perry, P. S. 1989. A survey of loons on small lakes in Crow Wing County, Minnesota. Minnesota Department of Natural Resources, Nongame Wildlife Program, Unpublished Report. 6 pp.
- Ralph, C. J. and J. M. Scott. 1981. Estimating numbers of terrestrial birds. Studies in Avian Biology. Vol. 6. Cooper Ornithological Society. 630 pp.
- Robinson, W. L., J. H. Hammill, H. R. Hill, and T. A. de Bruyn. 1987. The status of the Common Loon in Michigan. Pp. 132-144. In P. I. V. Strong (ed.) Papers from the 1987 conference on loon research and management. North American Loon Fund, Meredith, NH.
- Sjolander and Angren. 1972. Reproductive behavior of the Common Loon. *Wilson Bulletin* 84(3):296-308.
- Strong, P. I. V. 1988. Changes in Wisconsin's Common Loon population. *Passenger Pigeon* 50:287-290.
- Strong, P. I. V., J. A. Bissonette, and J. S. Fair. 1987. Reuse of nesting and nursery areas by Common Loons. *Journal of Wildlife Management* 51:123-127.
- Strong, P. I. V. and Richard Baker. 1991. An estimate of Minnesota's summer population of adult Common Loons. Minnesota Department of Natural Resources--Biological Report No. 37. State of Minnesota. 64 pp.
- Zimmer, G. E. 1979. The status and distribution of the common loon in Wisconsin. M.Sc. thesis, University of Wisconsin-Stevens Point. 63 pp.
- Zimmer, G. E. 1982. The status and distribution of the Common Loon in Wisconsin. *Passenger Pigeon* 44:60-66.
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50 years ago in *The Passenger Pigeon*

In an article entitled "Birds or Bombers?," Society members were urged to consider selling their Zeiss or Bausch & Lomb binoculars to the Navy. Apparently binoculars could not be produced fast enough for the needs of the Navy. Prices paid for 7×50 glasses ranged up to \$85.00 and for 6×30 , up to \$55.00. The Navy was not authorized to accept gifts or free loans. Therefore, if one did not want to sell outright to the Navy, binoculars also would be purchased for \$1.00 and, if they were available after the war, they would be returned to the donor, in which case the \$1.00 would constitute rental and depreciation charges. The Navy promised that every effort would be made to return the same instrument to the owner after the war. If practicable, the donor also would be notified of the vessel to which the instrument is assigned. The editor concluded the article by stating, "Every bird student having binoculars of the types needed will have to answer this question for himself--'Birds or Bombers?'" (Excerpts from Volume 4)



Wood Ducks by *Martin R. Murk* (S66 W38205 Hwy. ZZ, Eagle, WI 53119).

Turkey Vulture Nest Records from Wisconsin

Turkey Vultures have been increasing in abundance in Wisconsin, but there have been few investigations of their nesting biology. We report on 191 nests in Wisconsin.

by Michael J. Mossman and Lisa M. Hartman

The Turkey Vulture has been part of Wisconsin's avifauna since pre-settlement and even prehistoric times (e.g., Schoolcraft 1821, Graustein 1951, Parmalee 1959). It was considered uncommon to rare in the late 1800s and early 1900s, with most birds reported from southwestern counties (Barger 1940, Barger et al. 1942, Kumlien et al. 1951). A population increase became apparent in some parts of the state by the late 1940s and has continued until present, with major concentrations still in the southwest, and minor ones in the Kettle Moraine country of the southeast and near Mountain in the northeast (Knudsen 1976, Thiel 1977, Mossman and Lange 1982, Temple and Cary 1987, Robbins 1991, Mossman 1991). Despite this long history of observations, the recent rise in numbers, and the vulture's habit of nesting in accessible and noteworthy sites such as caves and abandoned buildings, few Wisconsin nest records have been published. Here we summarize information from 191 nests at 67 sites, suggest that the population

increase is associated with an increase in nesting, and conclude that the species is now a fairly common breeder locally in the state.

METHODS

We learned of many nests from personal contacts and reports to the Wisconsin Department of Natural Resources (WDNR) during 1973–1991. We also made annual nest searches in a 31-km² study area in the Baraboo Hills (Sauk County), 1983–91, and occasionally searched for nests in likely habitat elsewhere in the state. We sought specimens and other records at the Milwaukee Public Museum (MPM), University of Wisconsin museums at Green Bay, LaCrosse, Madison, Oshkosh, and Stevens Point, and several local museums. In 1989 we requested nest records from 95 North American museums with egg or skin collections, of which 69 responded. We searched for nest reports in the *Passenger Pigeon*, standard and obscure historical literature, unpublished field

notes, North American Nest Record Cards, and U.S. Fish & Wildlife Service bird banding records. We visited nearly all reported nest sites at least once during the period 1973–1991, and corresponded directly with all living nest observers.

RESULTS

Although H.L. Stoddard reported that a local resident had killed a young, apparently unfledged Turkey Vulture in the Baraboo Hills circa 1917 (Mossman and Lange 1982), the first positive Wisconsin nest (OC1) in Table 1 was recorded by C.H. Richter in Oconto County in 1947 (*Passenger Pigeon* 9:134. 1947). In about the same year LeRoy Lintereur (pers. comm. and Knudsen 1976) found another nest (OC2) in the same vicinity (Table 1). Both were in granite outcrops. In 1955 Manley Olson found a nest (PI1) in a Pierce County cave (Robbins 1991 and pers. comm.).

No other nests were reported until the 1970s, when records increased dramatically. Mossman (1976) found a nest in quartzite talus in the Baraboo Hills in 1973, and Mossman and Lange (1982) later reported on a total of 16 nests (SK1–10) at 10 Baraboo Hills sites during 1973–81. In 1974, Erdman (*Passenger Pigeon* 38:110. 1976) found a nest (OC3) on a granite knoll in Oconto County, and Smith (1977, 1985) began 3 years' observations of a nest (VE3) in a sandstone cave in Vernon County. Smith (1985) also mentioned 3 more nests reported by other observers from southwestern Wisconsin caves: in Vernon County near Ontario prior to 1977 (VE1); in Monroe County in 1976 (MO1); and in LaCrosse County in 1981 (LC1). A 1979

nest (WB2) in a barn loft in Washburn County was reported in the Chippewa Falls Herald Telegram (23 January 1982). Bielefeldt (Robbins 1991 and pers. comm.) found a nest (WK1) beneath a fallen elm in Waukesha County in 1980, and Steffen (1984) found one (MW1) in a Manitowoc County barn loft in 1984.

These 29 nestings at 21 sites constitute all previously published accounts of active vulture nests in Wisconsin.

Table 1 summarizes the preceding nest records plus additional records, previously unpublished, for a total of 191 nestings at 67 sites in 27 counties. Of these, 108 nestings occurred at 24 sites (SK1–17, SK19–24, SK26) in the Baraboo Hills. Nestings were documented for up to 14 years at a single site (SK1). Of the 46 newly reported sites, only 3 were known to be active before 1976: PE1 in 1958, RA1 in 1960, and VE2 in 1968. Each year during 1983–91, we documented 10–24 active nests statewide. At least 16 nests were active in 1991. No new nest records were obtained from museums, banding records, or nest record cards, except for a written description of nest RA1 in Owen Gromme's field notes at MPM.

In addition to the records in Table 1 is a verified report of a 2-week-old nestling in June 1991 on a roadside near Bagley (Grant County), a bird that had probably fallen from a nearby cliff nest (Joe Price pers. comm.). We have several suggestive reports of adults, unidentified eggs, or vulture feathers and whitewash found in typical nest situations, e.g., in sandstone or dolomite caves and ledges in Adams, Clark, LaCrosse, and Trempealeau counties, among boulders in Iowa and Oconto counties, and beneath an upturned

Table 1. Summary of Turkey Vulture nest records from Wisconsin (1947-91).

County	Site Code	Legal Description	Substrate ¹	Years Active	History ²	Observers ³
Adams	AD1	T19N R6E	Cave(s)	7	77?-2e,x; 81-2y; 82-i; 83-2y; 84-2e,x; 85-2y; 86-2y; 88-2y; 89 to 90-i	MMa,LL,MM,LH
Bayfield	BA1	T44N R5W	Building	1	85-1y	SD,TD
Bayfield	BA2	T49N R4W	Building	1	86-a; 88-i; 91-i	TD,MM,LH
Clark	CL1	T24N R2W	Rocks (s)	6	76-1y; 84-2y; 86-1y; 88-2y; 89-2y; 90-e,x	DFo,MM,LH
Clark	CL2	T26N R3W	Rocks (s)	5	79-2y; 81-2e; 83?-a; 85-2y; 86-2e,x	RMF,MM,LH
Columbia	CO1	T13N R8E	Rocks (s)	1	78-2y; 79-i	WS,MM
Dodge	DD1	T10N R6E	Log	1	83-2e,1y; 84-i	HZ,MM
Door	DR1	T31N R28E	Cave (d)	1	88-2y	VW,TE,LH
Door	DR2	T34N R30E	Cave (d)	2	88-a; 89-2e,x	RVv,LH
Douglas	DL1	T46N R10W	Building	1	91-1e	MR
Douglas	DL2	T47N R11W	Building	1	91-2y	LJ,JH,LS
Fond du Lac	FD1	T14N R18E	Stump	1	83-a; 84 to 86-i	TC,RR,MM
Green	GN1	T2N R6E	Building	1	91-2y	AK,MM
Grant	GT1	T3N R5W	Cave (d)	2	84-2y; 85-1y	EE,MM,LH
Grant	GT2	T6N R1W	Cave (s)	1	78-1e; 84-i	JSi,MM
Iowa	I01	T6N R3E	Rocks (s)	1	82-2y; 83 to 85-i	GW,MM,LH
Iowa	I02	T7N R3E	Rocks (s)	5	84-2y; 85-i; 87-1e; 88-2y; 89-2y; 90-2y	MM,LH
Iowa	I03	T7N R2E	Rocks (s)	1	88-2y; 89 to 90-i	BC,MM,LH
LaCrosse	LC1	T16N R7W	Cave (s)	1	81-2e; 89-i	JSo,MM,LH, Smith 1985
Manitowoc	MW1	T20N R25E	Building	1	84-1y; 85-i	JSt,DF,MM, Steffen 1984
Marquette	MQ1	T15N R10E	Brush	2	86-2y; 87-a,x; 88 to 89-i	DC,MM,LH
Monroe	M01	T18N R2W	Cave (s)	1	76-2e,1y; 83 to 84-i	BK,MM
Monroe	M02	T17N R1E	Cave (s)	1	88-2y; 89-i	SW,MM
Monroe	M03	T15N R2W	Cave (s)	1	91-1y	EE
Oconto	OC1	T31N R17E	Rocks (g)	1	47-1y	CR
Oconto	OC2	T31N R17E	Rocks (g)	1	48?-2e	LL
Oconto	OC3	T31N R17E	Rocks (g)	1	74-2e	TE
Pepin	PE1	T25N R14W	Cave (d)	2	58?-a, 80?-2y	RH
Pierce	PI1	T24-25N R16W	Cave (s)	1	55-2y	MO, Robbins 1991
Portage	P02	T23N R7E	Building	1	88-2y	GF,MM,LH
Racine	RA1	T4N R20E	Brush	1	60-1e,x	OG
Rock	R01	T2N R13E	Stump	1	88-2y	STe
Richland	RI1	T12N R2W	Cave (d)	1	88-2e,x; 89-i	JC,DS
Richland	RI2	T12N R2W	Cave (d)	1	88-2e,2y; 89-i	JC,DS
Sauk	SK1	T11N R6E	Rocks (q)	14	73-2y; 74-2y; 75-2e,2y; 76-2y,x; 77-2y; 78-2y; 79 to 81-i; 83-2e,2y; 84-2e,1y; 85-2e,x; 86-i; 87-1e,1y; 88-2e,1y; 89-2e,x; 90-3e,x; 91-2e,x	MM,LH,WS
Sauk	SK2	T11N R6E	Rocks(q)	2	74-2e,2y,x; 75-1y,x; 76 to 81-i; 83 to 91-i	VF,MM,LH
Sauk	SK3	T11N R6E	Rocks(q)	4	81-1y; 82-i; 83-2e,2y; 84-i; 85-2e,x; 86 to 90-i; 91-2e,1y,x	MM,LH
Sauk	SK4	T11N R6E	Rocks(q)	10	81-2y; 82-2y; 83-2e,2y; 84-2e,x; 85-2e,x; 86-i; 87-2e,2y; 88-2e,2y; 89-2e,2y; 90-2e,x; 91-e,x	MM,LH
Sauk	SK5	T11N R6E	Rocks (q)	3	81-2y; 83 to 84-i; 85-1e,x; 86 to 90-i; 91-1e,x	MM,LH
Sauk	SK6	T11N R6E	Rocks (q)	4	81-1e,1y; 83-2e,1y; 84-2e,x; 85-2e,x; 86 to 91-i	MM,LH
Sauk	SK7	T11N R6E	Rocks (q)	4	81-2y; 82 to 85-i; 86-e,x; 87-2y; 88-2y,x; 89 to 91-i	MM,LH
Sauk	SK8	T11N R6E	Rocks (q)	9	81-2y; 82-2y; 83-2e,2y; 84-2e,2y; 85-2e,2y; 86-2e,2y; 87-2e,2y; 88-2e,2y; 89-2e,2y; 90 to 91-i	MM,LH
Sauk	SK9	T11N R6E	Rocks (q)	3	81-2y; 83-2e,2y; 84-2e,2y; 85 to 91-i	MM,LH
Sauk	SK10	T11N R6E	Rocks (q)	5	81-2y; 82-2y; 83-2e,2y; 85 to 87-i; 88-2e,1y; 89-2e,2y; 90 to 91-i	MM,LH

continued

Table 1. (Continued)

County	Site Code	Legal Description	Substrate ¹	Years Active	History ²	Observers ³
Sauk	SK11	T11N R6E	Rocks (q)	3	83-2e,x; 84 to 85-i; 86-3e,x; 87 to 90-i; 91-1y	MM,LH
Sauk	SK12	T11N R6E	Rocks (q)	4	83-2y; 84-2e,2y; 85-2e,2y,x; 86 to 87-i; 88-2y; 89 to 91-i	LH,MM
Sauk	SK13	T11N R6E	Rocks (q)	5	83-2y; 84 to 85-i; 86-2e,2y; 87-2e,2y; 88 to 89-i; 90-2e,2y; 91-2e,x	LH,MM
Sauk	SK14	T11N R6E	Rocks (q)	3	83-2y; 84-i; 85-1e,1y; 86-i; 87-2e,2y; 88 to 91-i	MM,LH
Sauk	SK15	T11N R6E	Rocks (q)	5	83-2e,2y; 84-2e,2y; 85-2e,1y; 86-1e,x; 87 to 88-i; 89-2e,2y; 90 to 91-i	MM,LH
Sauk	SK16	T11N R6E	Rocks (q)	8	84-1y; 85-2y; 86-2y; 87-2e,2y; 88-2y; 89-2e,2y; 90-2e,2y; 91-2e,x	RP,MM,LH
Sauk	SK17	T11N R6E	Rocks (q)	5	84-1y; 85-i; 86-2e,1y; 87-i; 88-2e,2y; 89-i;90-2e,2y; 91-e,x	MM,LH
Sauk	SK18	T4N R6E	Cave (s)	4	85-2y; 86-1y; 88-2y; 89-2y	KW,MM,LH
Sauk	SK19	T11N R7E	Rocks (s)	2	84-2y; 85-2y; 86-i	BZ,MM,LH
Sauk	SK20	T11N R6E	Rocks (q)	5	85-1e,x; 86-2e,2y; 87-2e,2y; 88-2y; 89-2e,x; 90 to 91-i	MM,LH
Sauk	SK21	T11N R6E	Rocks (q)	5	86-1y; 87-2y; 88-2y; 89-2e,x; 90-2e,x; 91-i	MM,LH
Sauk	SK22	T11N R6E	Rocks (q)	2	87-2y; 88-2e,2y; 89 to 91-i	MM,LH
Sauk	SK23	T11N R6E	Rocks (q)	1	91-1y,x	MM,LH
Sauk	SK24	T11N R5E	Rocks (q)	1	90-2y; 91-i	MM,LH
Sauk	SK25	T8N R4E	Cave (s)	1	91-2e,1y	STh,MM,LH
Sauk	SK26	T11N R5E	Rocks (q)	1	91-2y	BI,MM
Trempealeau	TR1	T18N R9W	Cave (s)	1	85-1y	JE,MM
Vernon	VE1	T14N R2W	Cave (s)	4	60-2y; 61-2y; 62-2e,x; 81 to 84-i; 85-2y	BB, Smith 1985
Vernon	VE2	T14N R1-2W	Cave (s)	2	68-1y; 69-a	CS
Vernon	VE3	T13N R3W	Cave (s)	3	74-1y; 75-1y; 76-1e,1y; 77 to 78-i	JSh,Smith 1985
Washburn	WB1	T41N R11W	Building	3	77-2y; 79-1y; 80-2y; 82-i	MG,RVa
Washburn	WB2	T41N R12W	Building	6	79-2y; 85-2y; 88-2y; 89-1y; 90-2e,2y; 91-2y	JSm,MM,LH
Waukesha	WK1	T7N R17E	Log	2	80-2e,2y; 81-2y; 82 to 84-i	JB,MM, Robbins 1991

¹Substrate rock types: s = sandstone, d = dolomite, g = granite, q = quartzite.

²Year (abbreviated to last 2 digits) is followed by activity, as indicated by the following codes: ? = year approximate, e = eggs, y = young, a = active (contents unknown), i = inactive, x = nest failed.

³Observers: Bob Breidenstein (BB), John Bielefeldt (JB), Daryl Christenson (DC), Tom Campagna (TC), Brian Clock (BC), Jody Cornell (JC), Scott Dufal (SD), Tom Doolittle (TD), Eric Epstein (EE), John Ebersold (JE), Tom Erdman (TE), Donna Feest (DFe), Don Follen (Dfo), Randy and Mary Jo Fox (RMF), Vernon Frame (VF), Garth Frost (GF), Michael Gratson (MG), Owen Gromme (OG), John Haack (JH), Lisa Hartman (LH), Randy Hoffman (RH), Becky Isenring (BI), L. Johnson (LJ), Alan Kiel (AK), Bessie Kmiecik (BK), Ian Livingston (IL), Leroy Lintereur (LL), Mary MacDonald (MMA), Mike Mossman (MM), Manley Olson (MO), Richard Prange (RP), Mark Radzak (MR), Roger Reif (RR), Carl Richter (CR), Larry Semo (LS), Jim Sime (JSi), Jim Simmons (JSm), Charles Sindelar (CS), Daryl Skrupky (DS), William A. Smith (WS), Jeanne Smith (JSh), Jim Solberg (JSo), Jim Steffen (JSs), Stan Temple (STe), Steve Thiessen (STh), Ray Vallen (RVa), Ron Vandervelden (RVv), Steve Walker (SW), Gary Walz (GW), Keith White (KW), Volney Wilson (VW), Howard Zubke (HZ), Bill Zuch (BZ)

tree stump in Green County. We visited most of these sites, often several years after the initial observation, and found them to be inactive. We received several misleading reports of "nesting pairs," which simply referred to 2 or more vultures being seen repeatedly in a particular area.

Nest-sites are summarized according to substrate in Table 2, and their geographic distribution is presented in Figure 1.

Nearly half of all known nest-sites were on the ground among rocks, and of these, 23 were beneath tumbled, angular boulders or in clefts of adjacent 2–4m tall cliffs, in quartzite outcrops of the Baraboo Hills (Fig. 2, 3). Others in this category have been in large sandstone talus (e.g., CL1, IO1, IO3, SK19) or beneath isolated rocks and boulders of sandstone, granite, or dolomite (e.g., CL2, CO1). At most or all sites, some rocks were at least 2m long. In one case (IO2), the nest cavity beneath a boulder was evidently enlarged by mammalian digging. All nests among rocks were beneath partial tree canopy and within forest, and nearly all were in the rugged, largely unglaciated "Western Upland" region (Martin 1965) of southwestern and west-central Wisconsin. Exceptions were 3

nests (CL1, CL2, CO1) on steep, rocky sandstone bluffs just outside the region, and 3 (OC1–3) on the granitic bluffs near Mountain in northeastern Wisconsin.

Nineteen nest-sites were reported from cliff ledges, erosional clefts, and caves of sedimentary rocks. Some nest cavities (e.g., MO2) were at ground level in cliffs as low as 3–4m; most (e.g., LC1, SK25) were elevated one to a few meters on relatively accessible ledges (Fig. 4); and 3 (AD1, GT1, TR1) were at or above the canopy on sheer, exposed cliffs (Fig. 5). All were in the Western Upland, except for one (AD1) on a sandstone butte of the unglaciated Central Sand Plain, and 2 along the Niagara escarpment in Door County. Nests were in forested settings.

Of the 9 nest-sites in abandoned buildings, 3 (GN1, MW1, WB2) were in second-story rooms or barn lofts, 4 (BA1, DL1, DL2, WB1) were on the ground floor of hunting shacks, barns, or houses, and 2 (PO1, BA2) were in basements of collapsed houses. At site MW1 (Fig. 6) the small barn was in good condition but described as "unused" (Steffen 1984). All other buildings containing nests were unused and dilapidated. At WB2 (Fig. 7, 8) birds nested in the hay loft of a former calf barn, but the loft gradually collapsed during the ensuing decade and eggs were eventually laid on the ground floor. Site MW1 was among open fields, 2 sites were within forest, and the remaining 6 were at the border of field and forest. All were isolated or otherwise free from regular human disturbance.

Two nests were found near ground level in hollow stumps, perhaps better described as "chimneys." Nest RO1

Table 2. Substrates of Wisconsin Turkey Vulture nests.

Substrate Type	Number of nest-sites	Percent of nest-sites
Among rocks	33	49
Cave or ledge	19	28
Abandoned building	9	13
Tree stump	2	3
Brush pile	2	3
Log	2	3
Total	67	99

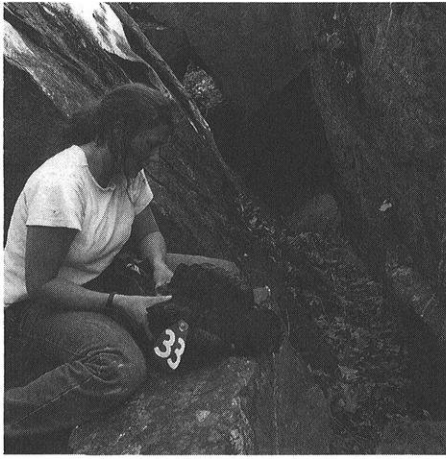


Figure 2. LH with adult vulture removed from quartzite talus nest SK12, beneath boulder in background. 20 May 1984 (photo by M.J. Mossman).

dozed trees, limbs, and rocks on the border of woods and oldfield, and another (RA1) in a brushy oak-hickory grove "a few acres in extent" among extensive, open muck farms (Owen

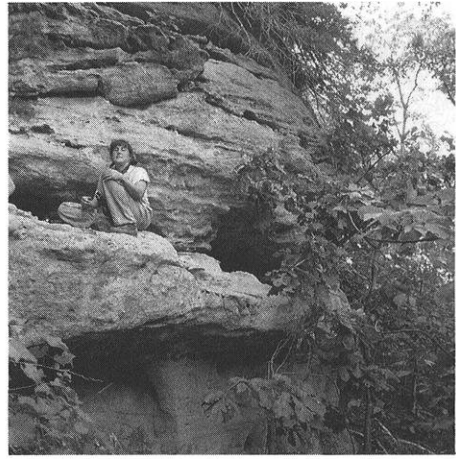


Figure 4. Sandstone cave nest LC1 is to right of LH. 3 Aug 1989 (photo by M.J. Mossman).

Gromme, MPM files). Two nests were associated with prostrate logs: DD1 was within a hollow log in an oldfield almost grown to woods, and WK1 (Fig. 10) was beneath the arched limbs of a fallen American elm in a lowland forest.

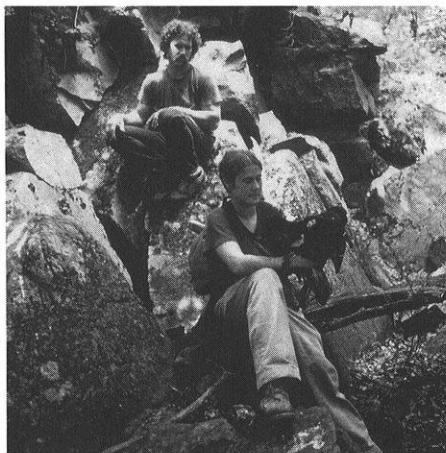


Figure 3. LH, Tom Schabacker, and nestling at quartzite talus nest SK17, which is in cavity below and left of TS. 4 August 1984 (photo by M.J. Mossman).

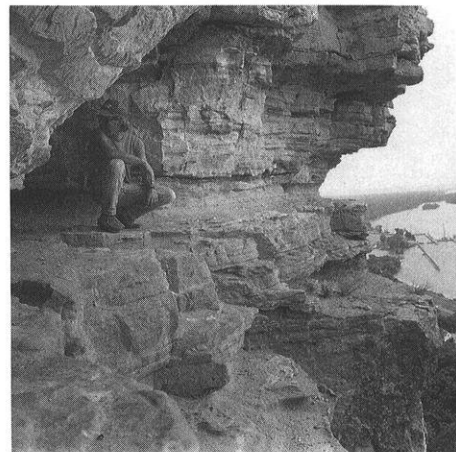


Figure 5. John Ebersold at sandstone cave nest TR1, high above the Mississippi River. 5 August 1989 (photo by M.J. Mossman).

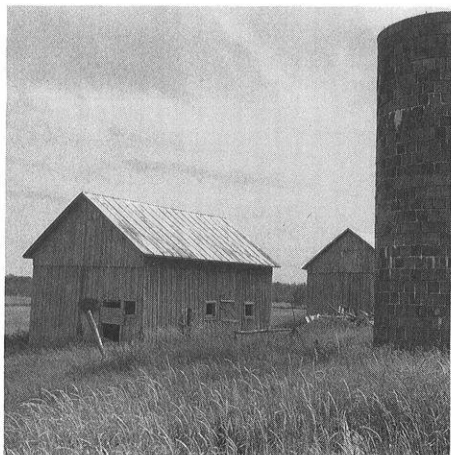


Figure 6. Nest MN1 is in loft of barn in foreground. 8 August 1985 (photo by M.J. Mossman).

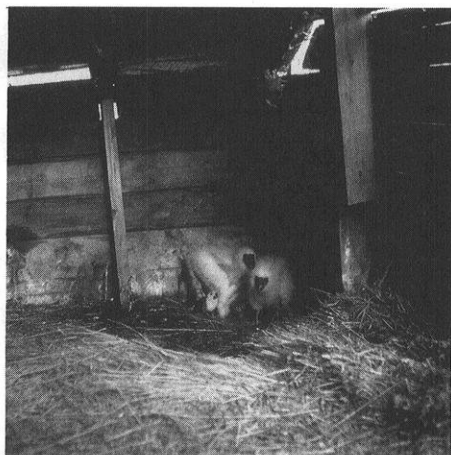


Figure 8. Nestlings in loft, nest WB2. 4 July 1985 (photo by M.J. Mossman).

DISCUSSION

The 67 Turkey Vulture nest-sites reported here include situations similar to those described elsewhere (e.g., Bent 1937, Jackson 1983, Mossman 1991). Nesting situations reported

from other areas, but for which there are no Wisconsin records, include mammal den burrows not associated with boulders (Babcock 1886), tree cavities far above the ground, and dense thickets of live vegetation (Bent 1937).

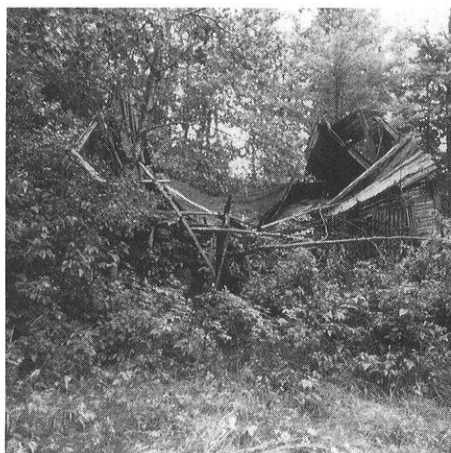


Figure 7. Nest WB2 is in loft beneath right-hand peak of collapsed barn roof. 4 July 1985 (photo by M.J. Mossman).



Figure 9. Basswood stump containing nest FD1. 9 August 1984 (photo by M.J. Mossman).

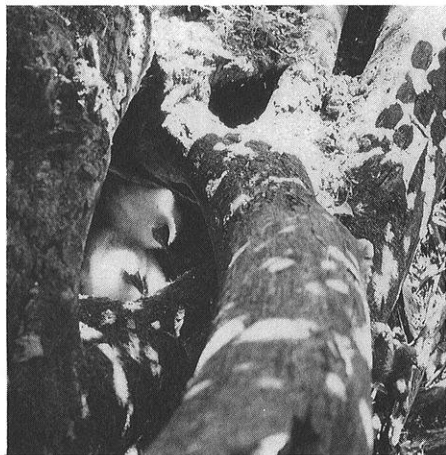


Figure 10. Nestlings under fallen elm, nest WK1. 22 July 1980 (photo by M.J. Mossman).

Wisconsin records include an unusually large proportion (49%) of nests among rock talus and scattered boulders, a situation described in the literature only rarely. Only 3% of 742 North American Turkey Vulture nests were reported "among rocks" by Jackson (1983). The frequency of this type of nest in Wisconsin reflects the prominence of resistant rocks such as quartzite, granite, and certain sandstones that break into large (>2m long) pieces, in forested Paleozoic and Precambrian outcrops, primarily in the unglaciated terrain of the southwestern counties. It also reflects the concentration of nest searches in one unglaciated area in the Baraboo Hills.

The distribution of nests throughout Wisconsin (Fig. 1) and our field investigations indicate that in areas where suitable rock, ledge, or cave nest habitat exists, vultures use these sites to the exclusion of others such as trees, logs, brush piles, or buildings. All known Wisconsin nests of the latter types were in areas where no suitable

rock outcrops occurred within at least 10 km, and usually at least 50 km. For example, nest-site BA1 was located in an abandoned building within 2 km of several cliffs and talus slopes along the Marengo River, but none of these had clefts or boulders large enough to provide for nesting. The only non-outcrop nest (GN1) in the Western Upland was in a building of the rolling, glaciated farm country of Green County, where potential nest outcrops are rare or nonexistent. In the Baraboo Hills, where suitable outcrops are common, we have failed to locate nests in any of the apparently suitable abandoned cabins and farmsteads.

The availability of rock and cave nest habitat is one reason for the concentration of Wisconsin's vulture population in the Western Upland. Rough topography probably plays another significant role by providing updrafts for soaring flight, as suggested by minor vulture concentrations in hilly areas without suitable nest outcrops, such as the Kettle Moraine.

Abandoned buildings are an important nest substrate in the forested northern counties (Fig. 1), where they are used almost exclusively. The first Wisconsin nest in a building was reported in 1977, and new sites have been reported with increasing frequency. Turkey Vultures apparently began nesting in buildings in the Midwest in the 1920s, and have since done so increasingly, while nesting less often in hollow trees (Mossman 1991). This change may reflect a continentwide response to the loss of large, heart-rotted trees suitable for nesting (Jackson 1983). The concentration of "building" nests in the north and of log and stump nests in the southeast is probably due to the relatively greater iso-

lation of buildings and greater logging activity in the north.

The proliferation of Wisconsin Turkey Vulture nest records since 1973 stems partly from our increased attention to the species. However, we feel it also reflects the well documented statewide population increase over the past 40–50 years, because: (1) published nest records have increased since 1973 independent of our work, and (2) most observers reporting nests during the past 20 years were also active in the field for one or more earlier decades without having located any nests. The growth of Wisconsin's Turkey Vulture population probably resulted from habitat changes farther south (Mossman 1991), but it has certainly been accommodated by the availability of suitable outcrops in western Wisconsin, and of isolated abandoned buildings elsewhere.

Because many of the state's summer resident vultures are probably non-breeders (unpublished data), and because individuals can travel widely on daily foraging flights, summer sightings of Turkey Vultures do not necessarily imply local nesting. Yet nesting has been documented for more than one-third of Wisconsin's 72 counties, and probably occurs regularly in most counties and occasionally in others. In the Baraboo Hills and perhaps a few other areas within the Western Upland and Oconto County, it should be considered a fairly common nester.

We encourage observers in Wisconsin and adjacent states to contact us with information on additional Turkey Vulture nests.

ACKNOWLEDGMENTS

We are grateful to the many people listed in Table 1 who informed us of

nests, and to others too numerous to list who accompanied us on nest searches in the Baraboo Hills. Partial funding was provided by Madison Audubon Society (1983–85) and the Wisconsin Society for Ornithology and Josselyn Van Tyne Memorial Fund (1974). We also thank The Nature Conservancy, WDNR, and private landowners who have protected and allowed us to visit nests on their properties. Comments from John Bielefeldt and David Sample improved this manuscript considerably.

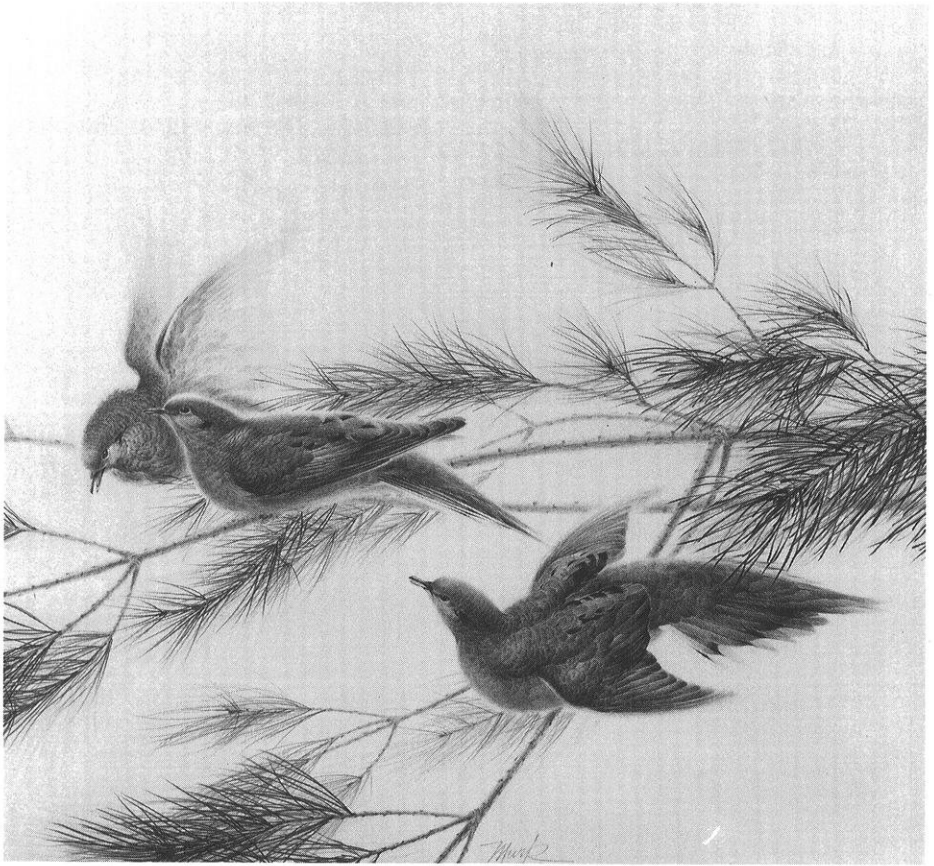
LITERATURE CITED

- Babcock, C. A. 1886. Turkey buzzards. *Oologist* 3:46.
- Barger, N. R. 1940. April field notes. *Passenger Pigeon* 2:67–69.
- Barger, N. R., E. E. Bussewitz, E. L. Loyster, S. D. Robbins, Jr., and W. E. Scott. 1942. *Wisconsin birds: a preliminary check list with migration charts*. Wisconsin Society for Ornithology.
- Bent, A. C. 1937. *Life histories of North American birds of prey*. U.S. National Museum Bulletin 167.
- Graustein, J. E., ed. 1951. Nuttall's travels into the old Northwest, an unpublished 1810 diary. *Chronica Botanica* 14:1–88.
- Jackson, J. A. 1983. Nesting phenology, nest site selection, and reproductive success of Black and Turkey Vultures. Pp. 245–270. In S. R. Wilbur and J. A. Jackson (eds.), *Vulture biology and management*. University of California Press, Berkeley. 550 pp.
- Knudsen, G. J. 1976. Preliminary survey of Turkey Vultures in Wisconsin. *Passenger Pigeon* 38:100–105.
- Kumlien, L., N. Hollister, and A. W. Schorger. 1951. *The birds of Wisconsin*. Wisconsin Society for Ornithology, Madison. 122 pp.
- Martin, L. 1965. *The Physical Geography of Wisconsin*. University of Wisconsin Press, Madison. 608 pp.
- Mossman, M. J. 1976. Turkey Vultures in the Baraboo Hills, Sauk County, Wisconsin. *Passenger Pigeon* 38:93–99.
- Mossman, M. J. 1991. Black and Turkey Vultures. Pp. 3–22. In *Proceedings Midwest Raptor Management Symposium and Workshop*. National Wildlife Federation Scientific and Technical Series, No. 15. 287 pp.
- Mossman, M. J. and K. I. Lange. 1982. *Breeding*

- birds of the Baraboo Hills, Wisconsin: their history, distribution, and ecology. Wisconsin Department of Natural Resources and Wisconsin Society for Ornithology, Madison. 197 pp.
- Parmalee, P. W. 1959. Animal remains from the Raddatz Rockshelter, Sk5, Wisconsin. *Wisconsin Archeologist* 40:83-90.
- Robbins, S. D. 1991. *Wisconsin birdlife*. University of Wisconsin Press and Wisconsin Society for Ornithology, Madison.
- Schoolcraft, H. R. 1821. Narrative journal of travels through the northwestern regions of the United States . . . to the sources of the Mississippi River. E. & E. Hosford, Albany. 421 pp.
- Smith, J. G. 1977. *Nature walks in the Kickapoo Valley*. Jeanne Smith, LaFarge, WI.
- Smith, J. G. 1985. *The tales of TeeVee*. Jeanne's Dreams, LaFarge, WI. 57 pp.
- Steffen, J. F. 1984. Turkey Vultures breeding in unused farm buildings. *Passenger Pigeon* 46:101.
- Temple, S. A. and J. R. Cary. 1987. *Wisconsin birds: a seasonal and geographical guide*. University of Wisconsin Press, Madison. 364 pp.
- Thiel, R. P. 1977. The status of the Turkey Vulture in southeast Wisconsin. *Passenger Pigeon* 39:213-219.
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"Blue Mist" (Canada Geese) by Martin R. Murk (S66 W38205 Hwy. ZZ, Eagle, WI 53119).



Mourning Doves by *Martin R. Murk* (S66 W38205 Hwy. ZZ, Eagle, WI 53119).

Acadian Flycatchers Nesting in Conifer Plantations in Southeastern Wisconsin

Breeding populations of this state-threatened species have been discovered in atypical habitat in southeastern Wisconsin. The implications of this discovery are discussed.

by John Bielefeldt and Robert N. Rosenfield

In Wisconsin, the Acadian Flycatcher (*Empidonax virescens*) occurs regularly in the breeding season only within the southern third of the state, where Robbins (1991) considers it uncommon. This flycatcher was added to the Wisconsin Department of Natural Resource's list of threatened species in 1989 not only because of its limited distribution and relatively small numbers in the state, but also because it apparently requires large blocks of forest as nesting habitat (Temple 1986, Robbins et al. 1989). Requisite areas of unbroken forest have become increasingly rare in the urban and agricultural landscape of southern Wisconsin, where most woodlands have been fragmented into parcels too small to support Acadian Flycatchers (Bond 1957, Ambuel and Temple 1983, Temple 1988).

As in other parts of its range (e.g., Bent 1942, Smith 1977, Hamel et al. 1982), breeding habits of the Acadian Flycatcher in Wisconsin are usually characterized as floodplain, stream-side, or moist upland sites within the

interior of mature deciduous forests (Bond 1957, DeJong 1976, Mossman and Lange 1982, Robbins 1991). Dominant tree species in occupied hardwood habitat in the upper Midwest typically include sugar maple, beech, basswood, and/or red oak, with yellow birch, other maples, other oaks, and ashes also common on some sites (Mumford 1964, Walkinshaw 1966, DeJong 1976, Mossman and Lange 1982). Hemlock supplies a coniferous element within such hard wood stands at some breeding areas in Wisconsin (Mossman and Lange 1982) and elsewhere (Mengel 1965, Walkinshaw 1966) but relative abundance of Acadians showed a highly significant negative correlation with conifer cover in Maryland and adjoining states (Robbins et al. 1989).

Here we document numerous nests of the Acadian Flycatcher in floristically "atypical" habitat in conifer plantations in the Kettle Moraine State Forest in southeastern Wisconsin. We also suggest that the mix of extensive oak forests and intervening conifer

plantations in the south Kettle Moraine may harbor an important breeding population of this state-threatened species.

STUDY AREA

The Southern Unit of the Kettle Moraine State Forest in Waukesha, Jefferson, and Walworth Counties encompasses about 7000 ha of state-owned land along the interlobate moraine and adjoining outwash plains. Dry/oak forests occupy about 2500 ha mainly on the rougher topography of the moraine itself. Red oak is often a dominant or co-dominant tree on the somewhat moister slopes and floors of intramorainal valleys and kettlehole depressions; white, black, or bur oaks are ordinarily dominant on other sites. Mesic maple-basswood forests are virtually lacking, as are native conifers except red cedar on very dry sites.

In addition, about 1200 ha of former croplands on gentler topography were planted to red and white pines (locally Norway spruce) between 1941 and 1975. These plantations have now filled many former gaps in forest cover on the study area (see Figure 4 in Rosenfield et al. 1991).

Including minor amounts of other woodland types such as aspen, total forest cover in the Southern Unit is thus about 4000 ha. Roads and other openings isolate some smaller stands but the Unit's three biggest blocks of contiguous forest together account for approximately 40% of the total area of "large" woodlands (>32 ha in size) in the 7-county region of southeastern Wisconsin (unpub. data, Southeastern Wisconsin Regional Planning Commission). This share of regional forest area

would be much greater if "large" woodlands were defined as 100+ ha in size.

Annual observations of Acadian Flycatchers in the study area's conifer plantations, 1978–90, indicated that most birds were found in 35–50 year old stands that had undergone one or more commercial thinnings and had consequently developed an understory of shrubs and saplings. In 1991, we focused our search for flycatchers on 10 of those older stands, thinned 3 months to 14 years earlier, near Eagle, Waukesha County.

Study stands ranged from 4 to 32 ha in size and totalled 116 ha. Conifer cover, mapped onto 1:4800 aerial photos, was 15% white pine, 33% red pine, 36% mixed pine, and 3% spruce, the last in one stand only. Hardwoods were present in the canopy of all stands as isolated trees, small groves, or old farm fencerows but provided only 13% of overstory canopy cover. Hardwood forests also abutted 5500 m (38%) of study plantations' total perimeter of 14600 m, with the remainder bounded by other plantations (22%) or roads and non-forest cover (40%).

Tree-sized conifers (≥ 10 cm DBH) showed similar modes in diameter (20–30 cm), height (18–23 m), and density (350–700/ha) in all study stands. Depending on thinning history and other overstory mortality, density of shrubs and saplings (woody stems ≥ 1.0 m tall and < 10 cm DBH, excluding canes and vines) was highly variable, ranging from near zero in some parts of recently thinned stands to around 26 thousand stems/ha in other areas. Densities of 6–10 thousand stems/ha were frequent.

As discussed later (see also Table 1), non-indigenous species are prominent

if not predominant among shrubs and saplings. "Non-indigenous" plants include those not native to North America (e.g., common buckthorn, glossy buckthorn, "bella" honeysuckle) or southeastern Wisconsin (e.g., white pine, mountain-ash) as well as a few native species not normally present (e.g., poison sumac) or abundant (box-elder) in mature upland forests of southern Wisconsin (Curtis 1959). As with the conifer canopy, the shrub-sapling layer of study plantations is thus largely alien to southeastern Wisconsin.

METHODS

Acadian Flycatchers are readily detected in the breeding season. Song occurs at a relatively high and constant rate from late May to late July (Mossman and Lange 1982:35). Although females may sing (Mumford 1964, pers. obs.), they do so much less frequently than males and we assumed that all persistently singing individuals were males. Both sexes also give distinctive call notes; songs and calls are audible at ≥ 100 m (pers. obs.).

We searched for singing or calling Acadians and nests in 4–14 visits (median 9 visits) to each study stand between 16 May (when birds were first detected) and 4 August (when several nests still held eggs). We plotted male movements and obtained simultaneous detections for all singers spaced < 250 m apart, the maximal length of territories among these males. We thus estimate densities by methods analogous to spot mapping (International Bird Census Committee 1970).

Active nests were defined as those with eggs, nestlings, or attendant adults exhibiting nest building, incu-

bating, or brooding behaviors. Inactive nests were empty with no attendant adults. Because females appear to perform all nest building activities (Mumford 1964, Walkinshaw 1966, pers. obs.) we assumed that discovery of a nest in the area occupied by a singing bird signaled the presence of a mated pair. We sampled vegetation at nest sites ($n = 18$) in 0.04-ha plots centered on nests using methods modified from James and Shugart (1970), randomly selecting a single nest site for sampling in territories where we located multiple nests.

RESULTS AND DISCUSSION

We found singing male Acadian Flycatchers repeatedly present at 23 sites (territories) in 9 plantations. We failed to detect the species in only 1 of the 10 plantations studied. We discovered one or more active nests ($n = 24$) in 17 (74%) of these 23 territories. We also located 5 inactive nests in the same 17 territories, another inactive nest in 1 additional territory, and a calling bird (presumably female) simultaneously and repeatedly present with a singing male in still another territory. We assume that mated pairs were present at the last 2 sites. Minimum densities within the 116 ha of conifer plantation surveyed in 1991 were thus 7.9 singing males, 6.6 pairs, or 5.9 active nesting territories, respectively, per 40 ha.

Deciduous trees outnumbered conifers in only two of the eighteen 0.04-ha plots centered on flycatcher nest sites. One of these hardwood-dominated plots lay at the margin of a small black locust grove within the interior of a plantation; the other was an oak-pine edge along a plantation's perim-

eter. Pines or spruce dominated all other plots in terms of relative tree density (median = 93%, range 55–100%, $n = 16$). Most flycatchers thus bred within the preponderant coniferous cover types rather than nesting selectively in hardwood micro-habitats within or abutting plantations, even though such hardwood-dominated micro-sites were available in or immediately adjoining all study stands.

Fourteen (78%) of the 18 sample-site nests and 24 (80%) of the 30 total nests were built in tree, sapling, or shrub species (Table 1) that are non-indigenous in mature upland forests of southeastern Wisconsin (see Study Area). Taken together, such non-indigenous plants were used as nest sites (78%) in approximate proportion to their availability (72%) in the 18 nest site samples. The two non-indigenous species providing a majority of total nest sites (common buckthorn and boxelder) were also among the three commonest shrub and sapling species surrounding nest sites (Table 1).

It is possible that plant species' availabilities at nest sites (Table 1) are not representative of their numbers in other unsampled portions of study stands. If so, nesting flycatchers must be selectively using or selectively avoiding areas with greater proportions of non-indigenous plants. Non-indigenous species must thus be floristically prominent and compositionally predominant in nesting sites, study stands, or both.

Our list of 9 plant species used as nest sites in plantations in 1991 (Table 1) has only one species (black cherry) in common with the total of 16 species tabulated as nest sites in hardwood or hemlock-hardwood forests in Wisconsin (Mossman and Lange 1982, $n = 79$

nests), Illinois (Graber et al. 1974, $n = 41$), and Michigan (Mumford 1964, $n = 37$; Walkinshaw 1966, $n = 137$). The plants most frequently used for nesting in these other midwestern studies ($\geq 63\%$ of nests) are rare (sugar maple, witch-hazel) or absent (beech, hemlock) in the south Kettle Moraine. Conversely, only 2 species (red oak, red maple) of the 14 most important shrub and sapling species in the Acadian's hardwood habitats in Wisconsin's Baraboo Hills (Mossman 1982) were recorded in our vegetational samples (34 species) at plantation nest sites.

The conifer plantations used by Acadian Flycatchers in the south Kettle Moraine are thus floristically very different from the mature hardwood forests previously described as breeding habitats in the upper Midwest. The differences are not limited to canopy dominance by planted pines and spruce but also include a prevalence of non-indigenous species among understory shrubs and saplings. Despite their atypical flora, these plantations do furnish acceptable breeding habitat for Acadians: in 1991, most males (83%) were mated, and active nests were found in most territories (74%). Although the productivity of breeding attempts remains to be assessed, plantations are not "marginal" habitat occupied by unmated or non-nesting birds.

It is interesting that Acadian Flycatchers have colonized a seemingly novel habitat, but the vegetational or other ecological attributes that attract them to conifer plantations are not yet apparent. Floristic features—the presence or abundance of particular plant species—can sometimes be strongly associated with the presence of abundance of certain bird species (Wiens

Table 1. Plant species availability and use at plantation nest sites.

Plant species	Sample plots (n=18)		All nests (n=30)
	No. available stems	No. nests	No. nests
Trees			
Red pine ¹	171	1	2
White pine ¹	80	1	2
Norway spruce ¹	45	2	3
Black cherry	15	2	2
Boxelder ¹	13	1	1
Other non-indigenous ¹	12	0	0
Other indigenous	20	0	0
Shrubs and Saplings			
Common buckthorn ¹	415	7	10
Boxelder ¹	100	1	5
American elm	28	1	3
Red oak	28	1	1
White mulberry ¹	18	1	1
Other non-indigenous ¹	212	0	0
Other Indigenous	330	0	0
Total Non-Indigenous (%)	1066 (72)	14 (78)	24 (80)

¹Not indigenous (see text).

1989:309, Knopf et al. 1990). Such an association appears unlikely in this case because plantations and more typical hardwood habitats have few plant species in common. However, studies of vegetational structure at foraging sites and nest sites (in progress) might reveal non-floristic similarities between plantation and hardwood habitats.

CONSERVATION IMPLICATIONS

The mean density of 7.9 singing male Acadians per 40 ha in our 10 Kettle Moraine study plantations (range 0–13.8) was intermediate between those reported by spot-mapping methods in other parts of Wisconsin. Gustafson (1976) recorded a maximum of 1.5 males per 40 ha at the Cedarburg beech-maple woods state natural area, while Mossman (1982) reported 2.1–37.6 males per 40 ha (\bar{x} = 20.4) in 4 stream gorges in the Baraboo Hills, often considered to hold the largest and best area of forest habitats in southern

Wisconsin (Tans and Lange 1975). Although he did not use spot-mapping methods, Bond's (1957) survey of 64 stands of upland hardwood forest in southern Wisconsin suggest a maximum density of approximately 26 male Acadians per 40 ha.

Because we selected study stands on the basis of prior presence of Acadians, density in these plantations may not be representative of numbers in similar habitat in other parts of the south Kettle Moraine. However, we did find 42 adult flycatchers in stands totalling 116 ha. At least 150 ha of seemingly comparable habitat in older thinned plantations already exist elsewhere on these state forest lands; some of these other plantations are known to have held Acadians in past years. Additional amounts of potential habitat will arise as younger plantations (up to 950 ha) reach thinnable age.

Moreover, Acadians also occur in hardwood habitats in some parts of the south Kettle Moraine's extensive oak

forests. A transect count in one such area on 23 June 1991 detected seven singing males in approximately 60 ha of forest.

We cannot estimate the total population of Acadian Flycatchers in the south Kettle Moraine. We do suggest that the possibility of a large breeding population of this state-threatened species on the biggest forested area in southeastern Wisconsin merits closer attention by conservation agencies. Such attention is particularly appropriate in light of the continuing commercial management of conifer plantations, and more recently oaks, in the Kettle Moraine State Forest.

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LITERATURE CITED

- Ambuel, B. and S. A. Temple. 1983. Area dependent changes in the bird communities and vegetation of southern Wisconsin forests. *Ecology* 64:1057-1068.
- Bent, A. C. 1942. Life histories of North American flycatchers, larks, swallows, and their allies. *U.S. National Museum Bulletin* 179.
- Bond, R. R. 1957. Ecological distribution of breeding birds in the upland forests of southern Wisconsin. *Ecological Monographs* 27:351-384.
- Curtis, J. T. 1959. *Vegetation of Wisconsin*. UW Press, Madison.
- DeJong, M. J. 1976. Distribution of breeding birds in relation to vegetation in lowland forests of southern Wisconsin. M.S. Thesis, Univ. of Wisconsin-Madison.
- Graber, R. R., J. W. Graber, and E. L. Kirk. 1974. Illinois birds: Tyrannidae. *Illinois Natural History Survey Biological Notes* No. 86.
- Gustafson, D. K. 1976. Species composition and absolute population density of breeding birds obtained by two methods. *University of Wisconsin-Milwaukee Field Stations Bulletin* 8:1-4.
- Hamel, P. B., H. E. LeGrand, Jr., M. R. Lenartz, and S. A. Gauthreaux, Jr. 1982. Bird-habitat relationships on southeastern forest lands. *USDA-Forest Service General Technical Rep.* SE-22.
- International Bird Census Committee. 1970. An international standard for a mapping method in bird census work recommended by the International Bird Census Committee. *Audubon Field Notes* 24:722-726.
- James, F. C. and H. H. Shugart. 1970. A quantitative method of habitat description. *Audubon Field Notes* 24:727-736.
- Knopf, F. L., J. A. Sedgwick, and D. B. Inkley. 1990. Regional correspondence among shrub steppe bird habitats. *Condor* 92:42-53.
- Mengel, R. M. 1965. Birds of Kentucky. *AOU Ornithological Monograph* No. 2.
- Mossman, M. 1982. Breeding birds of forested stream gorges in the Baraboo Hills, Wisconsin. *American Birds* 36:68-70.
- Mossman, M. and K. I. Lange. 1982. *Breeding birds of the Baraboo Hills, Wisconsin*. Wis. Dept. Nat. Res. and Wis. Soc. Ornithol., Madison.
- Mumford, R. E. 1964. Breeding biology of the Acadian Flycatcher. *Misc. Publ. Mus. Zool., Univ. of Michigan* No. 125.
- Robbins, C. S., D. K. Dawson, and B. A. Dowell. 1989. Habitat area requirements of breeding forest birds of the Middle Atlantic states. *Wildlife Monographs* 103.
- Robbins, S. D., Jr. 1991. *Wisconsin birdlife*. UW Press, Madison.
- Rosenfield, R. N., J. Bielefeldt, R. K. Anderson, and J. M. Papp. 1991. Status reports: Accipiters. In *Proc. of the Midwest Raptor Management Symposium and Workshop*, Natl. Wildlife Fed., Washington, D.C.
- Smith, K. G. 1977. Distribution of summer birds along a forest moisture gradient in an Ozark watershed. *Ecology* 58:810-819.
- Tans, W. E. and K. I. Lange. 1976. *Natural areas and features inventory of Sauk County, Wisconsin*. Wis. Dept. Nat. Res., Sci. Areas Preserv. Council.
- Temple, S. A. 1986. Predicting impacts of habitat fragmentation on forest birds: a comparison of two models. Pp. 301-304. In J. Verner, M. L. Morrison, and C. J. Ralph (eds.). *Wildlife 2000: modelling habitat relationships of terrestrial vertebrates*. UW Press, Madison.
- Temple, S. A. 1988. When is a bird's habitat not habitat? *Passenger Pigeon* 50:37-41.
- Walkinshaw, L. H. 1966. Studies of the Acadian Flycatcher in Michigan. *Bird-Banding* 37:227-257.

Wiens, J. A. 1989. *Ecology of bird communities*.
Vol. 1: foundations and patterns. Cambridge
Univ. Press, Cambridge.

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American Kestrel by *Martin R. Murk* (S66 W38205 Hwy. ZZ, Eagle, WI 53119).



"Marsh Lace" (Snowy Egret) by *Martin R. Murk* (S66 W38205 Hwy. ZZ, Eagle, WI 53119).

Population Trends and Proposed Management Plans for Fourmile Island Rookery at Horicon Marsh Wildlife Area

Surveys by the Wisconsin Department of Natural Resources of Great Blue Heron, Great Egret, Black-crowned Night-heron and Double-crested Cormorant populations on Fourmile Island have been ongoing since the early 1970's. Recent results indicate a steady decline in the Great Egret population, a state threatened species. The Wisconsin Department of Natural Resources has recently prepared a management plan to maintain nesting egrets and assess the results to the population.

by William K. Volkert

Horicon Marsh is located in Dodge and Fond du Lac counties, in south-central Wisconsin. The marsh is 13½ miles long and up to 5½ miles wide, covering nearly 32,000 acres. Horicon Marsh is a restoration project, being ditched and drained for agriculture in the early part of this century. Today, the marsh has been restored as a State Wildlife Area and National Wildlife Refuge. It is the largest freshwater cattail marsh in the U.S. and has recently been designated as a Wetland of International Importance by the Ramsar Convention on globally significant wetland systems.

Fourmile Island is located in the southern portion of Horicon Marsh, in

the state wildlife area (Figure 1). The island is also protected as a State Natural Area, being one of 225 such areas in Wisconsin and the only one set aside for wildlife.

Fourmile Island was formed as a drumlin by the advancing ice of the Wisconsin glaciation (Battista 1988). It has been partially buried by sediment and emerges above the cattails as an island in the marsh. It is the largest island in Horicon Marsh, at 15 acres in size. The island has been occupied by herons and egrets for nearly 50 years (Fruth 1988, Robbins 1991). Surveys began in the 1960's under Emlen (D.H. Thompson, personal communication). The current data are

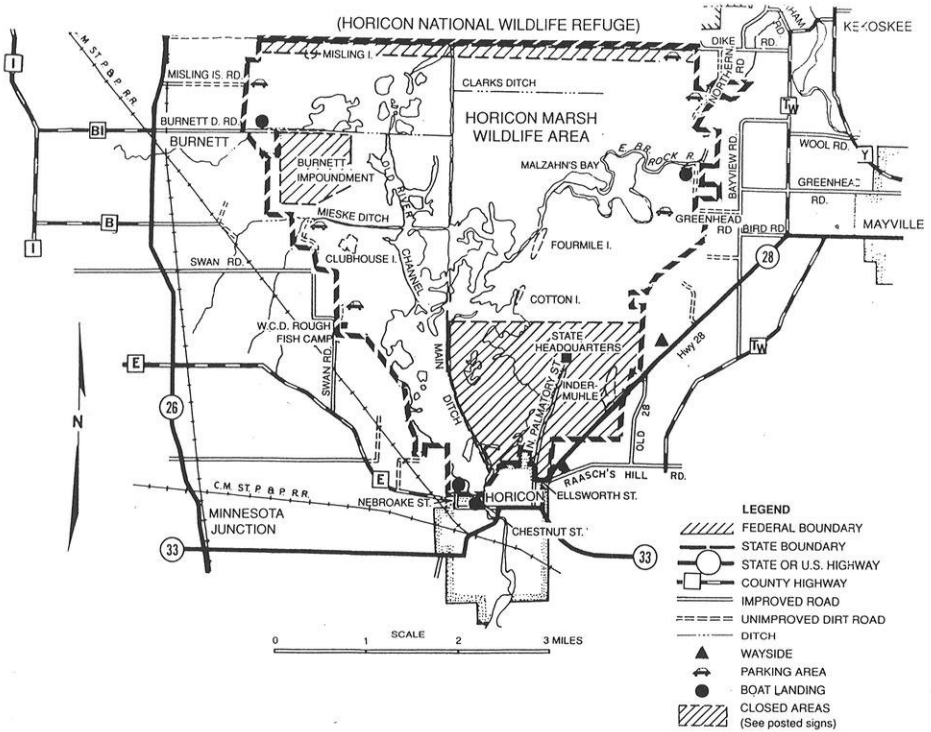


Figure 1. Location of Fourmile Island in Horicon Marsh Wildlife Area.

from the period of 1970 to 1990. Four species of birds nest in the rookery at Fourmile Island. They include the Great Blue Heron, Great Egret, Black-crowned Night-heron and Double-crested Cormorant. Monitoring of the island has particularly concerned itself with the status of the great egret, a state threatened species.

This bird was severely persecuted around the turn of the century by market hunters who shot the birds for their breeding plumes. As mentioned by Robbins, "Collection of egret plumes in southern states . . . severely affected the number of birds migrating to Wisconsin. Wisconsin experienced an almost complete dearth of (this) species between 1900 to 1930." As popula-

tions recovered statewide, the colony at Fourmile Island was established around 1943. Populations continued to recover statewide, when in 1956, 22 colonies were known across southern Wisconsin (Williams 1956). As habitat loss and water quality began to affect these birds in the 1960's and 70's populations again declined, leading to the egret being listed as a threatened species in the state (Thompson & Volkert, Wisconsin DNR 1988). Today, only 7 colonies remain in the state and 5 of these are located on the Mississippi River (Wisconsin DNR 1988) (see Figure 2). Fourmile Island is the largest rookery in the state and the only significant one in the interior of Wisconsin. Therefore the concern and



Figure 2. Locations of Great Egret colonies in Wisconsin.

continued monitoring at Fourmile Island is important.

The status of other birds in the rookery is not much better. The Great Blue Heron is listed as a species of special concern along with the Black-crowned Night-heron. The cormorant, a recent resident at Fourmile, was listed as endangered from 1973 to 1985 and then reclassified to threatened from 1985 to 1988 (Fruth 1988). It was the first species in Wisconsin to be considered as recovered and is now delisted (Fruth 1988). However, its recent occupancy at Fourmile Island and its great population growth is now causing concern over nest site competition with egrets and herons.

METHODS

Fourmile Island is surveyed twice a year to determine breeding population size and production of young for each of the four species. A summer census of young is conducted at the end of June each year, when the young are

nearly full grown, easily seen from the ground and have not yet fledged from the nests. The count surveys a sample of nests to determine the proportion of total nests of each species, nests with young and the number of young per nest. The adults must be present to identify the occupying species (Great Blue Heron, Egret and cormorant) for all large nests, with smaller nests being built by Black-crowned Night-herons. A series of 8 permanent transects over the short axis of the island were surveyed counting all nests within 50 meters of each side. Six to eight surveyors were required each year.

A winter census of total nests was conducted in late January each year when ice conditions are good for travel to the island. Three survey crews walk the length of the island to count all nests in good repair to determine the total number of occupied large and small nests from the previous season. The total number of nests occupied by each species in the previous year is obtained by multiplying the total nests by the proportion of nests used by each species as determined on the summer surveys. The number of nests per species is multiplied by the average number of young per nest, as determined in the summer count, to derive an estimate of the total number of young produced for each species in the rookery.

Since 1987, each tree occupied by a nest has been measured and tagged. Information is collected for each tree (species, diameter at breast height and condition—live, dying or dead). This provides us with an opportunity to track the success of each tree in the colony and to determine how fast they are declining in nesting use or disappearing as potential nesting trees. New

unmarked trees are marked and cataloged each winter to determine if trees are being pioneered as fast as others are disappearing. Approximately 1,000 trees have been marked for this part of the survey.

RESULTS AND DISCUSSION

Concern over the loss of nesting potential on Fourmile Island has been noted for several years. In the 1960's and '70's elm trees began to die from Dutch elm disease. The loss of each large tree meant the loss of many potential nesting sites, since large trees have been observed to contain up to 20 or 30 nests. Recently, oak wilt has killed many of the largest red oaks and as a result a large "hole" is opening up in the center of the colony where no live trees exist and most have already fallen.

The tremendous long-term use by the birds themselves is of concern. This island has been occupied continuously for almost 50 years. Currently 500 to 1,000 nesting pair of birds are using the island and the accumulation of guano appears to be affecting the health of the existing trees and the regeneration of new trees for nest sites.

As large trees die from disease, they first lose their limbs which provide nest sites. As the largest trees fall they not only eliminate many nesting opportunities, but these trees often take another one or two trees with them as they come down.

The population data is summarized in Table 1 and Figure 3. Black-crowned Night-herons reached a peak population in 1980 and 1981, with 1147 and 1246 nesting pairs, respectively. They have since nearly abandoned the island in favor of a nesting

site among cattails in the federal refuge. Great Blue Heron populations appear to remain relatively stable, with an average of 560 nests, ranging from 370 to 872. Great Egrets, a "threatened" species, has averaged 230 nests, ranging from 348 in 1972, to 75 in 1990. It has shown a steady decline over the past 5 years (Figure 4). Cormorants, conversely, demonstrate a steady increase at Fourmile Island since they first appeared in 1986. However, cumulative figures for the entire colony (Figure 5) indicate a decline in the total number of nesting birds at Fourmile Island.

Additional concern for Fourmile Island comes from studies conducted on rookeries in Illinois. Observations on the abandonment of nesting colonies demonstrate that they may not show a constant demise over many years. Instead, as populations numbers decrease they appear to reach a critical low number and are entirely abandoned the following year (Illinois Natural History Survey 1978).

RESEARCH AND MANAGEMENT PLANS

Due to the recent trend in tree loss and decreased nesting use and success, it was decided to try to off-set the loss of trees with the erection of artificial nesting platforms. This type of management has been successfully conducted to increase Double-crested Cormorant populations in Wisconsin (Meier 1981). Last fall, this was initiated at the Horicon National Wildlife Refuge (HNWR) where nesting trees have recently fallen. First season observations indicate that most of the platforms were occupied (personal communication, HNWR Staff). Cor-

Table 1. Fourmile Island survey results.

Survey year	Great Egret	Great Blue Heron	Black-crowned Night-heron	Double-crested Cormorant	Total
1971	146	371	459	0	976
1972	348	538	169	0	1055
1973	263	669	381	0	1313
1974	282	768	516	0	1566
1975	234	639	356	0	1229
1976	242	872	500	0	1614
1980	208	534	1147	0	1889
1981	311	504	1246	0	2061
1982	309	721	854	0	1884
1983	193	474	367	0	1034
1984	139	396	154	0	689
1985	302	705	154	0	1161
1986	281	437	281	22	1021
1987	268	712	348	52	1380
1988	197	437	261	153	1048
1989	108	372	50	53	583
1990	75	370	100	122	667

morants may have been moving from this rookery to Fourmile Island with losses in nest site availability.

In the winter of 1991, a series of 35- and 60-foot telephone poles will be

place on the east side of Fourmile Island. Platforms will be attached later in the year. This should temporarily substitute for the loss of natural tree sites. In order to manage for the long

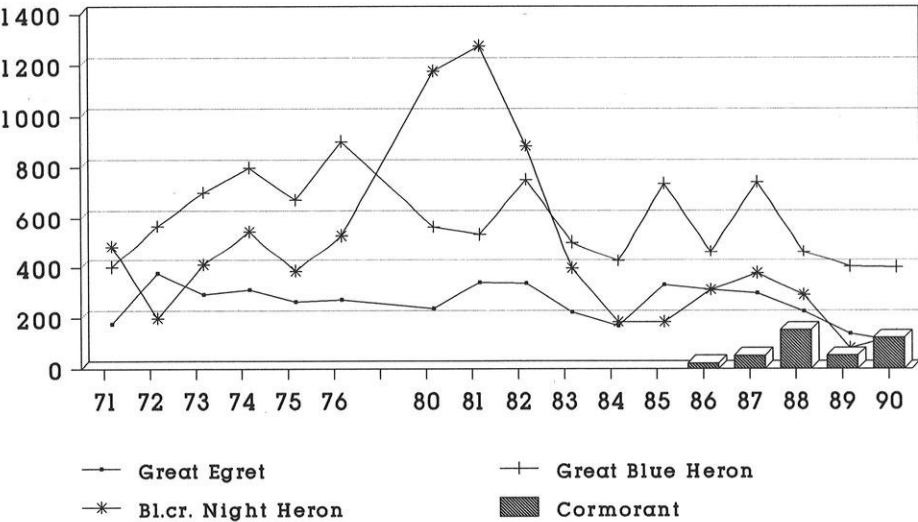


Figure 3. Fourmile Island rookery survey data.

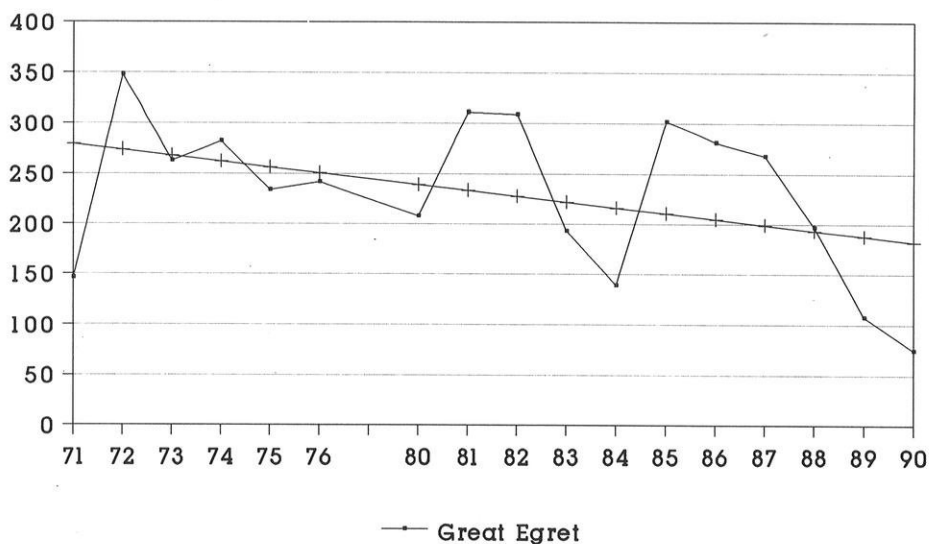


Figure 4. Great Egret population trends survey data.

term success and nesting opportunities for these birds other measures will be experimented with.

Soil samples have been collected to test for changes in soil chemistry. Ex-

perimental sites will be set up to test the possibility of neutralizing the soil acidity by liming several sites. Other measures include deer exclosures, to reduce browsing on seedling trees and

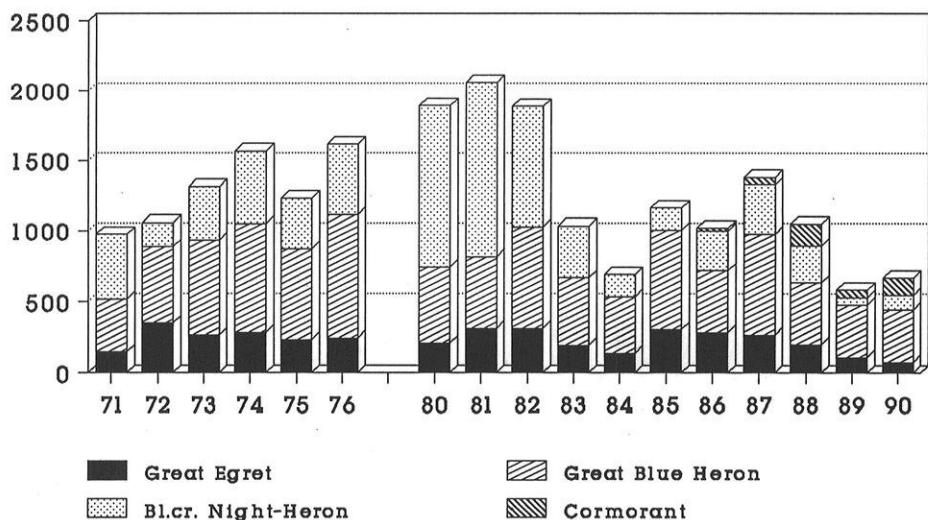


Figure 5. Fourmile Island rookery survey data.

underplanting with desirable nesting trees.

CONCLUSION

Fourmile Island has long been recognized as an important rookery for herons, egrets and cormorants. It is the largest such colony in the state and a State Natural Area. The surveys of the last 20 years have documented the decline in nesting populations and nest sites for herons and egrets.

Perhaps, the loss of these colonies is a natural process. Because of the impacts from such large numbers of birds and their young on the vegetation, there likely is an expected life span for such a rookery. This appears to be a natural phenomenon, without human intervention. Since man has restricted these birds and eliminated many other options for nesting sites through current land-uses, it falls upon us to maintain this most successful rookery site.

Beyond the effort to maintain nesting egret populations at Fourmile Island, we need to expand our focus to include the entire Horicon system, including the Rock River watershed. Continued monitoring of statewide rookeries and implementation of the Wisconsin Great Egret Recovery Plan (Fruth 1988) will focus on managing and hopefully increasing the population and number of nesting colonies in Wisconsin. Further study should also focus on survivorship and turn-over rates at Fourmile Island, post-nesting dispersal, migration and tracking of wintering populations to assure that the birds are finding suitable habitat and protection throughout the year.

Egrets are already at the northerly edge of their range in Wisconsin. If we

should lose the birds at Fourmile Island it is questionable whether we could ever bring them back to be a part of the nesting bird life in the interior of our state.

ACKNOWLEDGEMENTS

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LITERATURE CITED

- Battista, Janet. 1988. Quaternary Geology of Horicon Marsh. MS Thesis, University of Madison.
- Illinois Natural History Survey. 1978. *Biological Notes* No. 109.
- Meier, Thomas I. 1981. Artificial Nesting Structures for the Double-crested Cormorant. *WDNR Technical Bulletin* 125.
- Robbins, Samuel D. 1991. *Wisconsin Birdlife*. UW Press, Madison, WI.
- Thompson, David H. and William K. Volkert. 1979. Population trends of herons and egrets in southern Wisconsin (unpublished).
- Williams, Robert J. 1956. Great Blue Heron Colonies of Wisconsin. *Passenger Pigeon* 19(2).
- Fruth, Kathleen. 1988. Wisconsin Great Egret Recovery Plan. Wisconsin Department of Natural Resources Report 39.
- Wisconsin Department of Natural Resources. 1988. Wisconsin Bureau of Endangered Resources—1988 Annual Report.
- Wisconsin Department of Natural Resources. 1989. Annual Report of the Bureau of Endangered Resources. Wisconsin Endangered Resources Report 67.

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“Winging Through” (Green-winged Teal) by *Martin R. Murk* (S66 W38205 Hwy. ZZ, Eagle, WI 53119).

H. R. Schoolcraft and Natural History on the Western Frontier, Part 2: The 1820 Expedition

by Michael J. Mossman

The early 19th century was a time of rapid westward expansion of the American population. Paving the way were the explorations of Lewis and Clark, Stephen Long, Henry Atkinson, Zebulon Pike and others, who charted new territories, displayed a U.S. presence to Indians and white traders, and returned with information on the natural resources and inhabitants beyond the western frontiers.

The Cass expedition of 1820 was one of these, and had several goals. Since the War of 1812, trade between the British and the Indians of the Michigan Territory had been banned, yet it continued. The expedition was to determine the extent of this trade and the relative loyalties of Indian bands to the U.S. and British, as well as to explain the law and garner Indian allegiance. It was also to investigate the natural resources, especially mineral wealth such as the copper deposits south of Lake Superior, and to explore possible connections between the major water routes of Lake Superior, Lake Michigan, and the Mississippi, Wisconsin, and Fox rivers.

The expedition began at Detroit in

May, attained the upper reaches of the Mississippi River (then at the western edge of the Michigan Territory, now in north-central Minnesota), and returned to Detroit in September. It was led by Territorial Governor Cass, and included 8 "gentlemen" and a mixed-blood guide and interpreter. For protection and a show of force, there were also 7–11 U.S. soldiers, "most of them frenchman, selected by the Governor on account of their capacity to endure fatigue" (Trowbridge 1942). Ten to 11 Indians of the Chippewa, Potawatomi, Ottawa, and Shawnee tribes were along primarily as hunters and guides. Among their names were Source-Of-The-Wind, Black Dog, and Many-Openings-In-The-Clouds. For their skill in wilderness travel, 10–12 French-Canadian voyageurs formed an essential part of the crew. They had names such as Francois LeRoi, Jean Baptiste Trudel, and Anton Goodbon. The total party thus varied between 39 and 43 men.

Lewis Cass (1782–1866) was 38 years old, and had already served as Governor of the Michigan Territory for 7 years, as well as legislator, U.S.



Route of the 1820 Cass expedition through the Michigan Territory, by H.R. Schoolcraft.
(Courtesy of State Historical Society of Wisconsin.)

marshall, lawyer, and a celebrated officer in the War of 1812. He would maintain his position as governor until 1831, after which he would serve as U.S. Secretary of War, Secretary of State, Minister to France, Michigan senator, and the Democratic presidential candidate of 1848. By all accounts, Cass was savvy and resolute, and no mere politician. "He was not a man, indeed, who dealt in hems and haws—did not require to sleep upon a simple question—and is not a person whose course is to be stopped, as many little big men are, by two straws crossed" (Schoolcraft 1851:49). At the end of the expedition, Cass submitted a brief report to Secretary of War Calhoun (Schoolcraft 1855). For more biographical information, see Sears (1929) and Dunbar (1970).

Four of the gentlemen assistants left substantial records of the expedition, most of which were published posthumously:

James Duane Doty (1799–1865) was the expedition's official secretary, and wrote a journal (Doty 1895) and an informative letter to Cass (Doty 1876). Doty was 20 years old at the time of the expedition, and had just begun a law practice in Detroit. He later became a district judge, explored and surveyed Wisconsin and adjacent areas, served as Wisconsin territorial governor and congressman, U.S. Superintendent of Indian Affairs, and Utah territorial governor. His conflicting interests as politician and land speculator were controversial throughout his Wisconsin tenure (Ellis 1869, Sullivan 1930, Smith 1954).



Lewis Cass, from *The National Portrait Gallery of Distinguished Americans*, vol. 1 (1834). (Reproduction courtesy of State Historical Society of Wisconsin.)

Charles Christopher Trowbridge (1800–1883), like his friend James Doty, was 20 years old and lived in Detroit. A recent transplant from New York State, he was serving an apprenticeship as a clerk, and when asked to accompany the expedition, reportedly replied that he would “rather black boots” than miss it. He would eventually become an interpreter, accountant, and agent in the Michigan superintendency of Indian affairs, a prominent Detroit businessman, and would publish on Michigan history and Indians. He shared Cass’ canoe on the expedition, became a close friend, and later served as his personal secretary.

His journal of the expedition (Trowbridge 1942) was edited and published by R.H. Brown, who described it as “the writing of a youth who had grown to manhood in Albany and then was plunged into the raw Northwest frontier . . .”. Information on Trowbridge is in that publication and Campbell (1883).

David Bates Douglass (1790–1849) was a War of 1812 veteran, a surveyor, and a professor of mathematics and engineering at West Point Academy. Thirty years of age in 1820, he would continue in academia and civil engineering until his death (Dexter 1912, Shaw 1930). He was the official topographer and botanist of the expedition, and was much more qualified for the former than the latter task. His journal was only published relatively recently (Douglass 1969). His botanical collection from the expedition was



James Doty as a young man. (Photograph courtesy of Neville Public Museum of Brown County, reproduced by State Historical Society of Wisconsin.)



Charles Trowbridge. (Photograph courtesy of Burton Historical Collection, Detroit Public Library.)

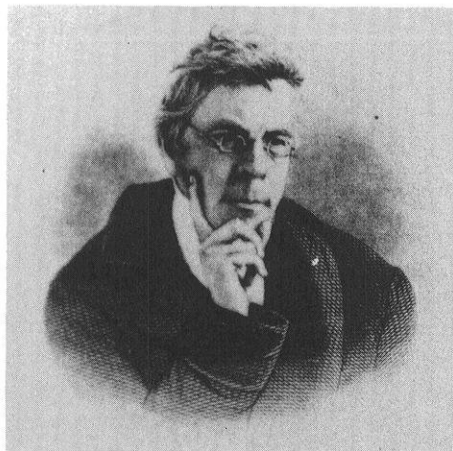
annotated and published by John Torrey (Douglass and Torrey 1822).

As previously noted, Schoolcraft, age 27, served as geologist and mineralogist. His major publications from the expedition were his widely read *Narrative Journal* (Schoolcraft 1821a), and his *Summary Narrative* (Schoolcraft 1855). In the latter book, appendixes include: Schoolcraft's official reports on geology, mineralogy, and meteorology; a list of animals observed, with their Chippewa name and limited notes; remarks on the expedition's animal records by zoologist S.L. Mitchill; Cass' official report and letters; and a summary of Douglass' latitude and longitude measurements. Also included in the *Summary Narrative* are a synopsis

and official reports of Schoolcraft's subsequent explorations and Indian studies.

Other publications resulting at least partially from the 1820 expedition had to do with mussels (Barnes 1823, Lea 1830, 1837), vertebrates (Mitchill 1821, 1822a,b), general zoology (Anon. 1823), and geology (Schoolcraft 1821b). More recently, Bremer (1982,1987) provided some insights into Schoolcraft's journals, but almost no comments on his natural history observations. Schorger (1946) summarized some of Schoolcraft's bird notes, and interpreted a few of his confusing entries. Voss (1978) discussed the botany of the expedition and its historical context, and further light was shed on this by Rodgers (1942) and Stuckey (1978). McKelvey (1955) quoted botanical observations from Schoolcraft and from Douglass and Torrey (1822), but did not discuss them.

Of the 5 accounts of the expedition, Cass' is the most abbreviated and the



David Bates Douglass. (Photograph courtesy of Greenslade Special Collections of Olin and Chalmers Libraries, Kenyon College, Ohio.)

least useful in recounting the travels, while the daily journals of Trowbridge, Doty, and Douglass are more captivating. Doty's and Douglass' are essentially original versions, whereas Trowbridge apparently edited his field notes after returning to Detroit. All 3 contain records of daily events, distances and directions of travel, encounters with Indians and whites, general vegetation cover, and some anecdotes on animal life. Douglass also made regular botanical and geological entries, and noted his frequent efforts at meteorological measurements necessary for determining latitudes and longitudes, which would be needed to improve existing maps of the territory.

Schoolcraft was the only one to actively pursue publication of a journal. Upon returning from the expedition he spent several months ambitiously transcribing, reworking, and augmenting his notes to increase their popular and scientific appeal, and to capitalize quickly on the opportunity for notoriety. In so doing, a few grammatical and factual mistakes were included, e.g., that the buffalo has a 12-month period of *gesticulation* (HRS¹:281). But perhaps more importantly, he thus lost the opportunity to cooperate with the other journalists, especially Douglass, who had understood that he and Schoolcraft would publish jointly. The conflict that arose between these two men, and other published criticisms of Schoolcraft's work are discussed by Bremer (1982, 1987) and in editorial sections of Trowbridge (1942) and Douglass (1969). Since its publication, however, Schoolcraft's *Narrative Jour-*

nal has remained one of the most well-known and valuable accounts of the presettlement western Great Lakes, and the appendixes in his *Summary Narrative* have made other pertinent documents accessible. Together with the less polished accounts of his fellow travelers and the scientific literature that followed, an excellent record of the expedition has been left, which includes some interesting natural history.

The expedition was to begin in May at Detroit. En route there from Albany, Schoolcraft was waylaid at Buffalo, for ice had not yet left Lake Erie. This afforded him a visit to the famous falls of Niagara on 1 May. Ever the critical observer, he commented on errors in published descriptions of the falls, such as of birds being mysteriously entrained into the falls from above, yet he also expressed an appreciation for geology that abides throughout his narratives:

"What has been said . . . respecting the destructive influence of the rapids above, to ducks and other waterfowl, is only an effect of the imagination. So far from being the case, the wild duck is often seen to swim down the rapid to the brink of the Falls, and then fly out, and repeat the descent, seeming to take a delight in the exercise. Neither are small land-birds affected on flying over the Falls, in the manner that has been stated. I observed the bluebird and the wren, which had already made their annual visit to the banks of the Niagara, frequently fly within one or two feet of the brink, apparently delighted with the gift of their wings, which enabled them to sport over such frightful precipices without danger. We are, certainly, not well pleased to find that some of the wonderful stories we have read of the Falls, during boyhood, do not turn out to be

¹Because Schoolcraft's (1821a) *Narrative Journal* is quoted so frequently in this paper, it is abbreviated simply as HRS.

the truth; but at the same time a little attention is only necessary to discover that many interesting facts and particulars remain unnoticed, which fully compensate for others that have been overstrained or misstated. Among these, the crystalline appearances disclosed among the prostrate ruins, and the geological character of the Falls itself, are not the least interesting." (HRS:38)²

Two days later Schoolcraft met Douglass at Buffalo. They arrived at Detroit by steamboat on 8 May, where "the half grown leaves of the beach [sic], the maple, the common hickory (*juglans vulgaris*)³, and the profusion of wild flowers on the commons, gave to the forests and to the fields the delightful appearance of spring" (HRS:71). Detroit was formerly the site of Indian settlements, but by 1820 it had long been a strategic military post and trade center, controlled successively by the French, British, and Americans. Then the seat of the Michigan Territory, it consisted of only about 200 houses and public buildings, and a non-military population of about 1,400, half of whom were French-Canadian. This was roughly the size of present-day Wisconsin towns like Belleville, Colby, and Denmark.

Several factors delayed the expedition's departure for another 2 weeks. During this time the various "gentlemen" prepared for the trip and explored the pastoral environs within today's Detroit metropolitan area. Douglass collected plants, took meteorological measurements, noted a

Northern Mockingbird, wrote home to his wife, and kept journal entries such as this from 15 May:

"The old farms . . . near the bank of the river above and below Detroit do certainly look very fine. Captain Stanton bought one of about 200 acres . . . It has 300 young apple trees on it from which he may now make say 100 barrels of the finest cider, a liquor for which this country is famous." (Douglass 1969:8-9)

This expedition into the wilds of the Northwest was to rely on the only practical vehicle—the birch bark canoe—and on the strength and expertise of the voyageurs and Indians, for whom these craft were a part of everyday life. Traders' canoes such as those used on the expedition were unlike our contemporary 16-ft crafts, as Schoolcraft described:

"The northwest canoe is . . . constructed wholly of bark, cedar splints, the roots of the spruce, and the pitch of the yellow pine . . . and these articles are fabricated in a manner uniting such an astonishing degree of lightness, strength, and elegance, and with such a perfect adaptation to the country, and the difficulties of the northern voyages, as to create a sentiment of mixed surprise and admiration. Those of the largest size, such as are commonly employed in the fur trade of the north, are thirty-five feet in length, and six feet in width at the widest part, tapering gradually toward the bow and stern, which are brought to a wedge-like point and turned over, from the extremities towards the center, so as to resemble in some degree the head of a violin . . . They are constructed of the bark of the white birch tree (*Betula papyracea*) which is peeled from the tree in large sheets, and bent over a slender frame of cedar ribs, confined by the gunwales, which are kept apart by slender bars of the same

²All quotes in this article are verbatim, although some punctuation has been altered slightly. For example, many of Schoolcraft's commas have been deleted.

³Current common and scientific names of plants and animals are provided in Table 1.

wood. Around these the bark is sewed by the slender and flexible roots of the young spruce tree, called *wattap*, and also where the pieces of bark join, so that the gunwales resemble the rim of an Indian basket. The joinings are afterward luted, and rendered water tight, by a coat of pine pitch, which, after it has been thickened by boiling, is used under the name of *gum*. In the third cross bar from the bow, an aperture is cut for a mast, so that a sail can be employed when the wind proves favourable. Seats for those who paddle are made by suspending a strip of board, with cords, from the gunwales in such a manner that they do not press against the sides of the canoe . . . A canoe of this size, when employed in the fur trade, is calculated to carry sixty packages of skins, weighing ninety pounds each, and provisions to the amount of one thousand pounds. This is exclusive of the weight of eight men, each of whom are allowed to put on board a bag or knapsack of the weight of forty pounds. In addition to this, every canoe has a quantity of bark, *wattap*, *gum*, a pan for heating the *gum*, an axe, and some smaller articles necessary for repairs. The aggregate weight of all this may be estimated at about four tons. Such a canoe, thus loaded, is paddled by eight men, at the rate of four miles per hour in a perfect calm—is carried across portages by four men—is easily repaired at any time and at any place, and is altogether one of the most eligible modes of conveyance that can be employed upon the lakes, while in the interior of the northwest—for river navigation, where there are many rapids and portages, nothing that has been contrived to float upon water offers an adequate substitute. Every night the canoe is unloaded, and, with the baggage, carried ashore; and, if during the day a storm should rise, such is the activity of the Canadian voyageurs that ten minutes time is sufficient to effect a landing and secure both vessel and cargo. Recom-

mended by these advantages, we felt an avidity to test them by experience; and, after a long voyage in which we have had occasion to complain of the confined posture of sitting, and of the frequency of injuring the canoes by striking against hidden rocks and logs of wood, we have nevertheless returned with an unaltered opinion of their superior utility and adaptation for northern voyages. Such is the vessel in which Europeans, adopting the customs of the savages, first entered the great chain of American lakes, and in which they have successively discovered the Mississippi, the Columbia, and the Arctic Sea; and the coincidence is deserving of remark, that it has been employed by every traveller of the region, from the time of Father Marquette⁴, the Jesuit, to the discoveries of Sir Alexander McKenzie⁵.” (HRS:67–69)

Finally, the expedition was ready to begin:

“May 24th, 1820—It was late in the day before our baggage could be embarked. At four o’clock in the afternoon, all was in readiness. A large concourse of people had collected upon the shore to offer us their good wishes and to witness our departure, when, upon the word being given, the voyageurs with one impulse struck their paddles in the water, and instantly chanting one of their animated songs, we passed rapidly along the town and in two hours time landed at Grosse Point, on the west shore of Lake St. Clair, nine miles from Detroit, where it had been previously determined to encamp. To this place Governor Cass and suite, accompanied by General McComb of the army, and a

⁴The Jesuit missionary Jacques Marquette (1637–1675) was renowned for his travels in the upper Great Lakes and is credited with the discovery of the Mississippi River.

⁵Alexander Mackenzie (1764–1820) made remarkable explorations through the Great Lakes and the Canadian wilderness in the late 1700s.

party of gentlemen and ladies from Detroit, who honored the expedition with this mark of attention, proceeded by land. Feeling an anxiety to witness the picturesque scenery presented from the river, I embarked on board the canoes at Detroit, but had nearly repented of my choice before reaching the place of our encampment, for the wind, which gave us no inconvenience of leaving the shore, soon shifted directly ahead, and blew with such violence that the waves broke over the canoes and gave us a severe drenching. Immediately on leaving Detroit a canoe race, and trial of skill, was witnessed between the French voyageurs and the Indians (who occupied a separate canoe) of our party, in which the expertness and spirit of the latter for sudden and short exertions, and the superiority of the former for labours long continued, were handsomely and clearly manifested. The banks of the river present a compact settlement along the American shore, in which the succession of farm houses, orchards, and cultivated fields, is in no place interrupted by forests, or even by detached copses of woods. Every thing bears the appearance of having been long settled and well improved . . . The appearance of extensive orchards, the wind-mills which occupy every prominent point along the river, the clearness of the water, the woody islands in the river, already covered with green foliage, and the distant view of Detroit, every moment receding in the landscape, all served to imprint a character of mildness and beauty upon the scene, which was perhaps heightened by the reflection, that it presented the last glimpse of a refined population which we were for some time to witness." (HRS:73-75)

Those men less accustomed to wilderness travel than Schoolcraft were more apprehensive:

"The feelings of us all may be justly appreciated on thus leaving our friends,

and the civilized world too, on a voyage of such length, danger, and difficulty, and it will not be thought strange that our spirits were . . . considerably depressed." (Doty 1895:164)

The party was delayed by headwinds at Grosse Point:

"The wind abated about eleven o'clock on the morning of the 26th, when the men commenced loading the canoes. It was twelve before we embarked. The mode of their embarkation is peculiar. The canoes, when laden, are hauled out in deep water; the men then catch up the sitters on their backs, and deposit them in their respective seats; when this was done, they struck up one of their animated songs, and we glided over the smooth surface of the lake with rapidity . . ." (Schoolcraft 1855:49)

" . . . we took our final departure . . . with a double feeling of pleasure, from the reflection of the termination of a delay, which had so early retarded our progress, and the anticipation of the novel and interesting scenes we were to encounter. A glow of satisfaction beamed on every countenance, which was heightened by the serenity of the atmosphere, and by the temperate warmth of the day . . . [Later] the wind arose and continued to blow with such violence, that with every exertion, little head way could be made, while the waves were frequently breaking across our canoes, which rendered it necessary for one man to be continually employed in bailing out the water. It was dark before we reached the entrance of the [St. Clair] river, which consists of a number of channels, separated by islands partly under water, and covered with a heavy growth of rushes, reeds, and tall coarse grass, affording no advantages for encampment, so that we were compelled to ascend the river to the upper end of Lawson's [Laughton's] island, a distance of two leagues [about 3 miles] where we arrived two hours be-

fore midnight, wet and cold, and passed an uncomfortable night." (HRS:78)

"This initial day's journey was calculated to take away the poetry of travel from the amateurs of our party, and to let us all know, that there were toils in our way that required to be conquered." (Schoolcraft 1855:50)

According to Trowbridge (1942:136), "On [Laughton's] island are some handsome farms, cultivated by Scotch peasants, by whom we were treated with much hospitality, in part owing perhaps to our wearing Plaided cloaks, which the good old Lady said, gave us a very friendly appearance."

They ascended the river the next day, past hardwood forest and farms.

"In passing up the river we have constantly observed ducks, plovers, and snipe; and while walking along the shore had the opportunity to witness the manner in which certain snakes prey upon inferior reptiles. In the present instance a common green snake (*Coluber aestivus*) had siezed upon a frog and succeeded in swallowing it alive, saving a small part of the hinder legs, which were visible when we discovered it. A blow at the snake was sufficient to relieve the frog, which fled towards the water without having received much apparent injury." (HRS:820)

Just what birds Schoolcraft actually saw here is uncertain. His incomplete faunal list from the expedition (Schoolcraft 1855:413-15) has been incorporated into Appendix 1, and identified "plover" as *Charadrius* and "snipe" as *Scolipax*. He was apparently referring generally to the 2 main shorebird families of the order Charadriiformes: the Charadriidae, or plovers, characterized by short bills; and the Scolopacidae, or sandpiper family, with long, thin bills. In this case his

plovers were probably Killdeer, and perhaps Piping Plover and nonbreeding stragglers of other species. His snipe were probably Common Snipe, American Woodcock, and/or Spotted Sandpiper, which have born colloquial names, respectively, of: "jack snipe" or "meadow snipe"; "wood snipe"; and "river snipe," "sand snipe" and "teeter-snipe" (Roberts 1932, Terres 1991).

Schoolcraft's "common green snake" was probably a garter snake. He used *Coluber aestivus* as the scientific name, which at the time referred to either the rough or smooth green snake (*Opheodrys aestivus*, *O. vernalis*), both of which are insectivores and unlikely to be found eating a frog; in addition, the rough green snake probably did not occur this far north. Later in his narrative (HRS:241), Schoolcraft does equate *C. aestivus* with the "common garter."

Along this stretch of the river, Douglass (1969:19) noted, "Strong growth of timber cleared at intervals and huts built. Fine shore. About noon the wind which had been light ahead sprung up fair and we made sail in lieu of paddles. Our light barque glides through the water at an astonishing rate."

They camped at Fort Gratiot, and completed the ascent to Lake Huron the following morning, where "one or two species of duck, the plover, and a small kind of gull, with white feathers and sharp pointed wings, have appeared, to variegate the scene" (HRS:84). The "gull" was probably Common or Forster's Tern.

Here soils became sandy and maple-oak forest was replaced by pine, aspen, birch, and hemlock. The following days were spent in rather uneventful, determined progress along the western

edge of Lake Huron, with little time for natural history observations. They noted a captive Bald Eagle in a passing Indian canoe. Douglass and Schoolcraft botanized and noted the geology and general vegetation cover along shore. On 2 June they camped "among swarms of black flies and mosquitoes" (Doty 1895:172) at Au Sable River, whose "waters abound in fish particularly sturgeon, of which an abundance was presented to us by the natives, who reside here at all seasons of the year in considerable numbers" (Trowbridge 1942:140).

On 4 June "we were much troubled with the mosquitoes, now very numerous, and succeeded in getting little sleep on account of their invasions, for although we were all provided with Bars or Nets, yet we did not trouble ourselves to pitch them. The evening was somewhat cold, and we found our Buffalo skins and blankets very comfortable." (Trowbridge 1942:141)

On 5 June they camped at Presque Isle:

"Here our Indians brought in a brown rabbit [snowshoe hare], a species of water turtle, and some [Passenger] pigeons; being the only success met with in hunting since leaving Detroit, with the exception of a partridge [Ruffed or Spruce Grouse] killed a few days previous. It is not to be inferred, however, that the country is destitute of game, or the savages lack skill in hunting it, but the plentiful supply of provisions which they have derived from the home-stock of the expedition takes away much of the usual incitements to hunting, while either the rapidity of our movements, or their momentary expectation of re-embarking while detained by head winds, has prevented them from straying any considerable distance from camp. In these short excursions, they have frequently

observed the tracks of the [white-tailed] deer and black bear, too [sic] of the largest animals now remaining in the forests along Lake Huron. Circumstances have been equally unpropitious in their attempts upon the ducks and other aquatic birds, which have occasionally, although not in large flocks, been seen along the shores; for the noise occasioned by our paddles has served to alarm them long before we could approach within shooting distance." (HRS:104-5)

Douglass (1969:26) procured "the shell of a species of land tortoise which is frequent here," possibly a wood turtle. Somewhere "on the gravelly shores of Lake Huron" he collected dwarf lake iris (Douglass and Torrey 1822:57), which is now federally threatened.

The next day they reached the fort and small settlements at the scenic straits of Mackinac, where Lakes Huron and Michigan meet.

"Thus terminates the first part of our journey, after a tedious voyage of fourteen days, in which we have encountered an almost continual head wind, with showers of rain, and very little weather that can be considered as warm for the season . . . We have also found the natural history of the country less interesting in the main than was expected; and the scenery has not been sufficiently diversified to keep up a general interest . . . The quadrupeds, the birds, and the plants would furnish very interesting objects to the land traveller, but can only be glanced at by the hasty voyageur." (HRS:107-8) They remained here for several days—receiving and repacking provisions such as bacon, bread, Indian corn, and flour; resting, and replacing a weak canoe with two additional ones. The gentlemen fraternized with local

counterparts. Douglass and Schoolcraft investigated the surrounding area, noting geological conditions and reliving some of the area's rich history.

The importance of the fur trade in the old Northwest can hardly be overstated. By 1820 it had long since altered Indian life, and although fur supplies were then waning, this trade still provided the major avenue of economic and social intercourse between whites and native peoples. The village of Mackinac was a center of trade, and "its permanent population does not differ far from four hundred and fifty, but is sometimes swelled by the influx of traders, voyageurs, and Indians, to one or two thousand" (HRS:112). It was the headquarters of the American, or South West, Fur Company:

"... this company is very extensive and their establishments are spread over all the country between the Mississippi and the great lakes. They have about 300 men in their employment, who come to Mackinac in the spring with the fur collected during the winter, where they stay from one to three months, when they receive another assortment of goods and proceed to their wintering grounds. Here during the winter they live like savages, enduring every privation and hardship for the sake of lucre." (Trowbridge 1942:142-3)

Schoolcraft extolled the strait's remarkable fishery:

"Few persons have visited [Mackinac] island without being struck with the variety and delicacy of the fish, which are caught in the vicinity. Among them we see two species of trout, the lake herring, black and white bass, sturgeon, mosquenonge, white fish . . . , pike, gar, perch, and catfish, with several other species of cartilaginous, and shell fish. Of these the white fish is most esteemed

for the richness and delicacy of its flavour, and there is a universal acquiescence in the opinion formerly advanced by Charlevoix [a French Jesuit missionary who explored the Great Lakes in 1721], 'that whether fresh or salted, nothing of the fish kind, can excel it' . . . This fine fish is very abundant around the island, and is taken with the hook and line." (HRS:118-19)

In this account, the "trout" are apparently lake and brook trout, the only trout species inhabiting the area prior to the subsequent introductions of various salmonid gamefish; or, this may refer to the two forms of lake trout. "Lake herring" is cisco, probably *Coregonus artedii*, which is now declining or threatened in most of the Great Lakes. "White bass" may be *Morone chrysops*, which no longer occurs around Mackinac (and perhaps never did), while "black bass" is probably smallmouth and possibly also largemouth bass. The remaining species are identified in Table 1.

On 13 June the party set out across the northwest edge of Lake Huron with an escort of 25 additional U.S. soldiers.

"In the course of the afternoon of this day, on landing in a small cove on the Huron shore, we saw a large porcupine upon the beach, on which one of the voyageurs jumped out of the canoe, and killed it with a hatchet. This animal has generally been confounded, by the travellers of the region, with the hedge-hog [*Erinaceus europeus*], which is entirely different in its characters and habits, and is not supposed to inhabit the northern regions of America, although it is frequently found in high northern latitudes in Europe . . . This animal is called *Caqua* by the Indians, by whom it is highly valued for its quills. The skin does not form an article of traffic, but it serves them as

a vessel to hold bears oil, and as medicine bags or short pouches. The quills are dyed with indigenous plants, of various beautiful colors, and employed to trim the edges of their mockasins, leggons, skins, and dresses . . . The Indians are very fond of the flesh of this animal, which is said to be delicious, and to resemble in flavor a young pig." (HRS:127-8)

They travelled up the St. Mary's River and arrived at Sault Ste. Marie the following day. This was the gateway to Lake Superior and the "Upper Country" beyond—an even more strategic location than Mackinac, but still largely under the influence of the British, whose North West Fur Company maintained a headquarters on the Canadian side of the river. On the American side was a settlement of Chippewas and a few households of mixed white-Indian marriages, with most whites being French-Canadian.

"Below the falls . . . we saw a number of indians in the act of taking white fish. These delicious fish are caught here in very great quantities and in fact constitute the principal food of the indians . . . as well as that of the whites . . . They take them in scoop-nets, with which they fish from canoes and the rocks. The fish caught at this place are acknowledged superior to any of the kind caught in the Lakes, possessing more richness of flavor, and being of much greater weight." (Trowbridge 1942:144-5)

Cass held a council here to arrange a cession of Chippewa land for the future construction of a military post and to gain better control over traffic through the Sault. Yet many of the Chippewa were hostile toward the U.S.:

"They were . . . determined not to accede to our wishes, and in seeing our-

selves surrounded by a brilliant assembly of chiefs, dressed in costly broadcloths, feathers, epaulets, medals, and silver wares, of British fabric, and armed from the manufactories of Birmingham, all gratuitously given, we could not mistake the influence by which they were actuated in this negotiation [sic] . . . The last chief who spoke . . . drew his war-lance and stuck it furiously in the ground before him, and assumed a look of savage wildness, which appeared to produce a corresponding effect upon the other Indians . . . and when he left [he] kicked away the presents which had been laid before him." (HRS:137-8)

Eventually the treaty was signed, owing largely to Cass' mettle and the advice and diplomacy of a local family—the Johnstons—who held considerable sway among whites and Indians of the region. Mr. Johnston was a white trader but was absent at the time. His wife was the daughter of a powerful Chippewa chief. Their children were formally educated abroad and in the East. Schoolcraft could hardly have anticipated at the time that in a few years he too would become part of this family, through marriage to the eldest daughter, Jane.

On 17-18 June the expedition continued up the rapids of the St. Mary's to the mouth of Lake Superior, leaving its extra military escort behind. As they approached the lake,

"the river spread broadly before us, and the highlands, which had been dimly seen from the Sault, presented their imposing outlines distinctly to the view, and were every moment assuming a new and more interesting character. The morning was clear and pleasant, with a gentle breeze blowing up the river, which, while it filled our sails and relieved the voyagers from labour, produced an exhilarating effect upon our spirits by its

refreshing coolness; and we approached the lake with a feeling of impatient delight. The most enchanting views were presented in every direction, and we fully realized the justice of the remark made by Carver [who explored the western Great Lakes region during 1766–67] ‘that the entrance into Lake Superior affords one of the most pleasing prospects in the world.’” (HRS:142)

The impressionable young Trowbridge (1942:147–48) was ambivalent:

“June 18th, we prepared to take a serious departure (for we had hardly considered it so as yet) from civilized Beings. The natural reflection that it would be the melancholy lot of some of us never to return, here strongly suggested itself to our minds, and our spirits were enlivened only by the animated boat songs of our Canadians . . . [But] we are becoming quite accustomed to our mode of travelling and sleeping, and it has been resolved that if our appetites continue to increase as they have done, we shall upon our return surprise our friends.”

They made camp late that night on the south shore of Lake Superior at the mouth of the Shelldrake River [now Betsy River], apparently so named after Common or Red-breasted Mergansers, which must have frequented it.

“We generally kept within a mile of the shore, and often much nearer so that it was constantly in plain sight. The shore of the lake thus far is sandy, without large pebbles, and with no bluff rocks at the water’s edge, although the highlands a few miles back, rise to a great height. The growth of timber is pine, hemlock (*pinus canadensis*), oak, aspen, and birch. At Shelldrake river, we found several lodges of Chippeway Indians, who are drawn to this spot by the advantages of taking fish at the mouth of the river; they

appeared friendly—presented us some dried white fish, and received in return, some tobacco.” (HRS:144–45)

On the 19th they met a trader and his crew returning eastward from Fond du Lac—the trading post along the St. Louis River upstream from today’s Duluth harbor. They gathered information on water levels and travel routes beyond the far end of Lake Superior. “We saw a scalp hanging at the stern of one of the canoes, probably that of a Sioux Indian as these and the Chippewas are at war” (Douglass 1969:45). Douglass added Labrador tea and bog laurel to his collection. The next day they passed the 250-ft tall dunes of Grand Sable. Schoolcraft’s appreciation was more geological than esthetic:

“The views . . . although generally commanding, present a great uniformity, and leave upon the mind a strong impression of bleakness and desolation. Even the few bushes and trees which are occasionally seen serve to increase this effect by their impoverished growth, while the birds of prey which we observed hovering around these bleak sandy heights could hardly be considered as ameliorating the dreariness of the prospect. The bald eagle perched upon a shattered tree half buried in the sand looked down upon us in security from a height of three hundred feet, while the noisy raven and the slow sailing falcon were perpetually on the wing. These birds are generally drawn together upon elevated bluffs and barren heights, that they may more easily discover and be directed to their prey, either in the adjoining waters or upon the land, and at the same time they are thus protected from the unseen approach of their enemies. But it may be doubted whether they do not always add to the forbidding appearances of such scenes

as are naturally sterile and destitute of vegetation." (HRS:146-47)

"... grand Sand Banks [are] much spoken of by Voyageurs . . . one of our Indians whom curiosity induced to ascend them had much the appearance of a child when running on the summit of the hills, and when he returned to the canoe he was almost exhausted with fatigue." (Trowbridge 1942:234)

That night "the most tremendous storm arose I ever witnessed. It came on from the N.W. and directly on the shore where we were camped. From the continued flashes of lightning the Lake appeared on fire. The wind was so strong it was with the utmost difficulty we kept up our tent—the Governor's was blown down and also one or two others. Lightning struck several times near us. The waves rolled up to the mouth of our tent, and completely over the Governors wetting all his baggage and the gentlemen with him" (Doty 1895:185).

The following day they marvelled at the tall, colorful cliffs known as Painted Rocks, which were described in superlatives by all 4 men. They reached the Huron River on the 23rd, where "we first noticed a creeping plant called *kinni-kinnic* by the Indians, which is used as a substitute for tobacco . . . and is very mild and pleasant . . . As the kinnikinnick only flourishes on sandy grounds, it is not always to be procured, in which case they employ other substances, the most common of which is the bark scraped off the small red twigs of the acer spicatum or maple bush⁶. Certain species of wil-

lows are also resorted to" (HRS 1821:161-62).

Here they passed "a sleepless night on account of the mosquitoes and a small gnat [black fly]. This little insect is venomous beyond description—it is not larger than the head of a pin, and consequently nothing can be constructed to prevent them from committing their depredations. They crawl into the hair and under the clothes, and every place they touch is instantly inflamed" (Trowbridge 1942:237-38).

On the 24th, 2 of the canoes made a harrowing traverse across the open, stormy water of Keweenaw Bay, in which even the gentlemen were forced to paddle and "to use our utmost exertions to enliven the spirits of the Voyageurs, who tho't of nothing but crossing themselves and going to the bottom" (Trowbridge 1942:238).

The following day the entire party cut across the Keweenaw peninsula by ascending the Portage River, past the site of present-day Houghton, up a small, rather artificial stream maintained by countless passages of voyageurs and Indians, and overland 1½ miles to regain Lake Superior. As always on the expedition, the voyageurs carried the bulk of the gear. "The usual load on the portages is 2 packs ["pieces"] or 180 pounds, but our Yankees [American soldiers] cannot bear burdens so great" (Trowbridge 1942:239).

"The word was, when we had pushed our canoes into the quagmire, that each of the gentlemen of the party was to carry his own personal baggage across the portage. This was an awkward business for most of us . . . I strapped my trunk to my shoulders, and walked myself out of breath in getting clear of the brushy part of the way, till reaching the

⁶Schoolcraft was evidently referring to red-osier dogwood, rather than mountain maple (*A. spicatum*).

end of the first *pause*, or resting place. Here I met the Governor (Cass), who facetiously said: 'You see I am carrying *two* pieces,' alluding to his canoe slippers, which he held in his hands . . . On reaching the termination of the second "pause," or rest, we found ourselves on a very elevated part of the shore of Lake Superior. The view was limitless, the horizon only bounding the prospect. The waves rolled in long and furious swells from the west." (Schoolcraft 1855:89-90)

While encamped on shore here that day and the next, Douglass, Schoolcraft, and Trowbridge explored the surrounding area. Schoolcraft engaged some of the Indians for the mineral specimens he desired, and they named him Paguabekiega, or, roughly, "the rocksmasher." Douglass collected plants such as bog bean, "owl's mockasin" (pitcher plant), and bastard toadflax, which was "used by the Indians and traders in fevers" (Douglass and Torrey 1822:60). Said Doty (1895:192), "The mosquitoes are very thick here but the sand fly, a small insect, is more numerous and much more annoying. It is impossible to sleep where they are. Their bite is like the prick of a needle."

On 27 June they continued westward along the south shore, traveling nearly 50 miles by 1 pm, when they reached the Ontonagon River, in view of the Porcupine Mountains. "At the mouth of this river are five permanent lodges of [about 60] indians, who seldom leave this place, but subsist chiefly on sturgeon which they take in great quantities . . . [the women] brought us sturgeon in such profuse quantities that we could not do ourselves the pleasure to accept it all" (Trowbridge 1942:239). Douglass (1969:57) noted that these Chippewa also ate "bear, pi-

geons, and other wild game." Schoolcraft (1855:94) stated that they "appeared to regard the Canadian-Frenchmen of our party as if they were of their own mode of thinking, and, indeed, almost identical with themselves."

Most of the party rested here, while Cass, Schoolcraft, local Chippewa guides, and a few others ascended the river in 2 small canoes, in search of copper, especially a particular boulder that had been celebrated in the accounts of earlier explorers.

"A broad river, with a gentle current, winding course, and heavy wooded banks, with the dark green foliage overshadowing the water, rendered the first part of the tour delightful. At the distance of four miles we reached a Sturgeon fishery, which the Indians have established in the river by means of a wier extending from bank to bank. This wier is constructed of saplings and small trees, sharpened and drove into the clayey bottom of the river with an inclination down stream, and supported by crotched stakes bracing against the current. Against the sides of these inclined stakes, long poles are placed horizontally and secured by hickory withes in such a manner as to afford the Indians a passage from one end to the other, and at the same time allow them to sit and fish upon any part of it. The sturgeon are caught with an iron hook, fixed at the end of a long slender pole, which the Indian, setting on the wier holds to the bottom of the river, and when he feels the fish pressing against the slender pole, jerks it up with a sudden and very dexterous motion, and seldom fails to bring up the sturgeon. On one side of the wier, an opening is left for the fish to pass up, which they do at this season in vast numbers, but in their descent they are hurried by the current against the hooks of the savages, who are thickly planted on

every part of the wier. The number of sturgeon caught at this place is astonishing, and the Indians rely almost entirely upon this fishery for a subsistence. What is not wanted for immediate consumption is cut into thin slices and dried or smoked . . . Five or six Indians were employed in fishing at the time we passed through, and we stopped some time to observe the sport, and had the satisfaction of seeing several brought up, one of which was presented to us. The sturgeon are generally from two feet to four feet in length . . . This fishery is of great importance to the Indians of the region, and appears to have been known to them from the earliest times, and has been constantly resorted to without any apparent diminution in the quantity taken. Henry⁷ says in 1765, 'that a months subsistence for a regiment, could have been taken in a few hours time.' We encamped two miles above on a sand bar. The musquitoes here gave us great annoyance." (HRS:172-174)

The next day the small party split, and Schoolcraft's group was led by foot at an exhausting pace over extreme topography through a trackless forest of hemlock, oak, maple, cedar, and pine, until finally they reached the copper boulder several miles upstream.

"The day was excessively hot, not a breath of air stirring except in the tops of the trees, and the thick evergreen undergrowth—besides rendering our passage extremely difficult—gave a sense of closeness around us almost approaching suffocation." (Douglass 1969:58)

This "thick evergreen undergrowth" is no longer a prominent fea-

ture of forested uplands in the Upper Peninsula. Although balsam fir is now a fairly frequent understory plant, Douglass was probably also referring to young hemlock and cedar, and especially Canada yew, all of which have since nearly vanished from the northwoods understory, in part from browsing by unnaturally high deer populations.

Schoolcraft did not have a good time here:

"One can not help fancying that he has gone to the ends of the earth, and beyond the boundaries appointed for the residence of man. Every object tells us that it is a region alike unfavourable to the productions of the animal and vegetable kingdom; and we shudder in casting our eyes over the frightful wreck of trees, and the confused groups of falling-in banks and shattered stones. Yet we have only to ascend these bluffs to behold hills more rugged and elevated; and dark hemlock forests, and yawning gulfs more dreary, and more forbidding to the eye. Such is the frightful region through which, for a distance of twenty miles, we followed our Indian guides to reach this unfrequented spot, in which there is nothing to compensate the toil of the journey but its geological character and mineral productions." (HRS:178-79)

The copper boulder was smaller than expected, and the 2 groups eventually rejoined and camped along the river:

"The camp-fires already threw their red glare among the trees as night spread her sable pall over us. The tents were pitched; the canoes turned up on the shore to serve as a canopy for the men to sleep under. Indians and Canadians were soon engaged at their favorite pipes, and mingled their tones and hilarious conversation; and we finally all

⁷Alexander Henry (1739-1824) was a successful fur trader during the 1760s and 1770s, and the first Englishman to leave a record of the upper Great Lakes.

slept the sounder for our eventful day's toils and misadventures. But deeply imprinted on our memory, and long to remain there, are the thrilling scenes of that day and that night." (Schoolcraft 1855:98)

They returned downstream the next morning:

"On descending eight or ten miles, our Indian guides stopped on the east bank of the river to examine a bear-fall that had been previously set, and were overjoyed to find a large bear entrapped. As it was no great distance from the river, we all landed to enjoy the sight. The animal set up on his fore paws facing us, the hinder paws being pressed to the ground by a heavy weight of logs which had been arranged in such a manner as to allow the bear to creep under, and then by seizing the bait had sprung the trap, and he could not extricate himself, although with his fore paws he had demolished a part of the works. After viewing him for some time, a ball was fired through his head, but it did not kill him, the bear kept his position, and seemed to growl in defiance. A second ball was aimed at the heart, and took effect, but he did not resign the contest immediately, and was at last despatched with an axe. As soon as the bear fell, one of the Indians walked up, and addressing him by the name of *Muck-wah*, shook him by the paw, with a smiling countenance, as if he had met with an old acquaintance, saying, in the Indian language, he was very sorry they had been under the necessity of killing him, and hoped the offence would be forgiven, particularly as *Che-mo-que-mon* [an American] had fired one of the balls . . . The Indians say that [the black bear] is very fond of all sorts of nuts, esculent roots, and wild honey, and frequently attacks their corn fields. It will travel a great way from its den into the pine ridges to feed upon whortle berries [blueberries], and is also very fond of mulberries [probably thimble-

berry], blackberries, and all sweet flavoured and spicy fruits . . . The Indians hold this animal in the highest estimation, not only on account of their great fondness for its flesh, but because there is no part of it which is useless. The carcass, the skin, the claws and head, and even the intestines, are all turned to account . . . The oil is, however, considered the most valuable part, whether kept for use or for the purpose of selling to the traders. They rub their bodies with it to protect themselves from the bite of the musquitoe. It has the singular property of destroying lice in the hair, and if occasionally used, of preventing their appearance altogether. They also rub their joints with it, believing with the Romans that it renders them supple." (HRS:183-85)

After returning to the Chippewa village, Douglass (1969:61) talked with some residents:

"I endeavored to obtain from them some of the topographical information about this river and the Point Keweenaw. One of them drew a map of the last which I regard as a curiosity. I gave him a plug of tobacco which, with much *sang froid*, he said was enough for he had not taught me much—that he knew every pace of the point where the beaver and duck ponds were and where the pigeon haunts, but he did not think it best we should know as much about it as he did. The other was tolerably communicative 'til we began to write, after which his suspicions were raised and we could get nothing further from him."

That evening he wrote:

"We hear them dancing in their village . . . and presume they are celebrating their bear feast. The pigeons are so numerous in the woods back of us that a great many have been killed with clubs. Forsyth killed several in the morning before we returned as they flew past the

tent and Riley, the interpreter, killed two with his fist."

Headwinds detained them here another day, when Schoolcraft observed:

"A sandy plain stretches along the shore of the lake as far as the eye can reach. The highlands of the Ontonagon are visible toward the south, and the Porcupine mountains at the distance of thirty miles west appear to rise out of the lake and imprint their lofty and rugged outlines upon the distant clouds. Towards the north there is an interminable expanse of water without a solitary island to variegated the view . . . While encamped here, the pigeons have been very plenty, and vast numbers have been killed, some with sticks and stones. The Indians have also supplied us with sturgeon from the fishery, both fresh and dried, and with a part of the bear . . ." (HRS:186-187)

Doty (1895:196-97) noted that "The Indians spoke of hunting the beaver and bear as though they were in plenty." Trowbridge (1942:241) reported that "the otter is seldom taken here," and that to white traders these Chippewa "were obliged to pay a Beaver Skin for a gill [$1\frac{1}{2}$ cup] of [gun]powder, the same for a shirt, 3 . . . for a blanket, one for 30 [rifle] balls."

On 1 July they passed the Porcupines, and camped 8 miles beyond the Black River. The soldiers had a hard time keeping up with the voyageurs and Indians: "Our soldiers' canoe fell back so far today that we were obliged to halt early at a bad camping spot, for it to come up. We made, however, about 50 miles" (Douglass 1969:64). Due to the effects of Lake Superior windstorms, most of the shoreline, as today, was "young white birch and poplar—the other white and yellow

pine. Still the timber a few miles from the shore is the same as on the 'Ntenagon" (Doty 1895:199).

The next morning they paused at the Montreal River, which today separates the states of Michigan and Wisconsin. Here, "the Indians have erected a wier for the purpose of taking white fish and sturgeon. Almost unlimited numbers of pigeons came flying over the banks into the gulf, from whence they ascended to the opposite. They flew so low that 30 or 40 were killed by our men with clubs and sticks thrown into the flocks as they passed" (Doty 1895:201).

For the remainder of the day they passed rapidly westward and made very few notes, e.g., observing the lack of large trees along the shore. At Chequamegon Point, "There is a sandy beach on the lake shore, and at the distance of from one to five miles in the lake lie a cluster of wooded islands, which Carver called the Twelve Apostles. There appears to be fifteen or twenty in number, and they present a very beautiful and picturesque group" (HRS:194).

They stopped briefly at the trading establishment at St. Michael's [Madeline] Island, where they encountered a "Jerboa" (Table 1), which Schoolcraft (1834:186) later described as, "an animal of the mouse type . . . whose hinder legs are so much longer than its forelegs, as to give it in this respect a character analogous to that singular Australasian quadruped, the Kangaroo. And from its power of leaping it has been locally called the *Jumping Mouse*. Very little is known of its habits."

They camped that night on the Bayfield Peninsula's east shore, and were slowed by bad weather for the next 2

days. At Sandy Point, on the peninsula's north shore, Douglass found an "abundance of blue pea [beach pea] of about 5 inches height and a little rose of 8 or 10 inches high." He collected both.

On 5 July they entered the mouth of the marshy Fond du Lac (St. Louis) River, much unlike the dredged Duluth harbor that has succeeded it:

"The mouth of this river is not more than a hundred and fifty yards wide, but immediately upon entering, it expands to a mile and continues this width for five or six miles, and this part of it resembles a lake more than a river, having little or no current—shallow in many places, and filled with aquatic plants. We here first saw in plenty the folle avoine, or wild rice, which is so common throughout the northwestern regions." (HRS:201)

By evening they had passed a Chipewewa village and ascended the river several miles along the present-day Wisconsin-Minnesota border, to the American Fur Company post at the foot of the first rapids. They stayed overnight here, and Doty (1895:202) noted,

"A spot of land of 3 or 4 acres from which the timber had been cut for fires, is tilled, and is now bearing very fine potatoes. The soil is a rich black mould. The Co. with great difficulty have transported to this place 3 horses, 3 cows, one yoke of oxen and 4 bulls . . . It was a great treat to obtain milk at this distance in the wilderness . . . A young crane about 3 ft. high had been *tamed* and was running around here."

LITERATURE CITED

Anonymous. 1823. Abstract of the Proceedings of the Lyceum of Natural History, New-York. *American Journal of Science* 6:361–365.

- Barnes, D. W. 1823. On the genera *Unio* and *Alasmodon*; with introductory remarks. *American Journal of Science* 6:107–127, 258–280.
- Bremer, R. G. 1982. Henry Rowe Schoolcraft: Explorer in the Mississippi Valley, 1818–1832. *Wisconsin Magazine of History* 46:440–59.
- Bremer, R. G. 1987. *Indian agent and wilderness scholar: the life of Henry Rowe Schoolcraft*. Central Michigan University, Mt. Pleasant. 445pp.
- Campbell, J. V. 1883. Biographical sketch of Charles C. Trowbridge. *Michigan Pioneer Collections* 6:478–491.
- Doty, J. D. 1876. Northern Wisconsin in 1820. *Wisconsin Historical Collections* 7:195–206.
- Doty, J. D. 1895. Papers of James Duane Doty: Official journal, 1820 expedition with Cass and Schoolcraft. *Wisconsin Historical Collections* 13:163–219.
- Douglass, D. B. (S.W. Jackman and J.F. Freeman, eds.) 1969. *American voyageur: The journal of David Bates Douglass*. Northern Michigan University Press. Marquette. 128pp.
- Douglass, D. B. and J. Torrey. 1822. Notice of the plants collected by Professor D.B. Douglass, of West Point, in the expedition under Governor Cass, during the summer of 1820, around the great Lakes and the upper waters of the Mississippi. *American Journal of Science* 4:56–69.
- Dunbar, W. F. 1970. *Lewis Cass*. Eerdmans Publ., Grand Rapids, MI. 96 pp.
- Ellis, A. G. 1869. Life and services of J.D. Doty. *Wisconsin Historical Collections* 5:369–377.
- Lea, I. 1830. Description of a new genus of the family Naiades, including eight species, four of which are new . . . with observations on some of the characters of the Naiades. *American Philosophical Society Transactions* 3:403.
- Lea, I. 1837. Observations on the Naiades; and descriptions of new species of that, and other families. *American Philosophical Society Transactions* 5:23–119.
- Mitchill, S. L. 1821. Description of two mammiferous animals of North America. *Medical Repository* 21:248–250.
- Mitchill, S. L. 1822a. The Proteus of the North-American Lakes. *American Journal of Science* 4:181–183.
- Mitchill, S. L. 1822b. Detection of a mistake into which naturalists have been led, in relation to the *Mus bursarius*, or pouched rat of Canada. *American Journal of Science* 4:183–185.
- Roberts, T. S. 1932. *The birds of Minnesota*. University of Minnesota Press, Minneapolis. 2 vols. 689 + 821 pp.
- Schoolcraft, H. R. 1821a. [=HRS]. *Narrative journal of travels through the northwestern*

- regions of the United States; extending from Detroit through the great chain of American lakes, to the sources of the Mississippi River. E. & E. Hosford. Albany. 421pp. (reprinted by Arno Press).
- Schoolcraft, H. R. 1821b. Account of the native copper on the southern shore of Lake Superior, with historical citations and miscellaneous remarks, in a report to the Department of War. *American Journal of Science* 3:201–216.
- Schoolcraft, H. R. 1834. *Natural history: The following extracts relative to the natural history of Michigan, are taken from a lecture delivered before the Detroit Lyceum*. Pp. 177–191. In L. Cass et al., *Historical and Scientific Sketches of Michigan*. Wells and Whitney. Detroit.
- Schoolcraft, H. R. 1840. Sketches of a trip to Lake Superior. *Knickerbocker Magazine* 16:213–218.
- Schoolcraft, H. R. 1851. Personal memoirs of a residence of thirty years with the Indian tribes on the American frontier; with brief notices of passing events, facts, and opinions. Philadelphia.
- Schoolcraft, H. R. 1855. Summary narrative of an exploratory expedition to the sources of the Mississippi River, in 1820, resumed and completed by the discovery of its origin in Itasca Lake, in 1832. Lippincott, Grambo, and Company. Philadelphia.
- Schorger, A. W. 1946. Henry Rowe Schoolcraft. *Passenger Pigeon* 6:35–37.
- Sears, L. M. 1929. Cass, Lewis. *Dictionary of American Biography* 3:562–564.
- Smith, A. E. 1954. *James Duane Doty: frontier promoter*. State Historical Society of Wisconsin, Madison. 472 pp.
- Sullivan, J. 1930. Doty, James Duane. *Dictionary of American Biography* 5:390–391.
- Terres, J. K. 1991. *The Audubon Society encyclopedia of North American birds*. Wings Books. New York. 1109pp.
- Trowbridge, C. C. (R. H. Brown, ed.). 1942. With Cass in the Northwest in 1820. *Minnesota History* 23:126–148, 233–252, 328–348.
- Voss, E. G. 1978. Botanical beachcombers and explorers: pioneers of the 19th century in the upper Great Lakes. *Contributions from the University of Michigan Herbarium*, vol. 13. Ann Arbor. 100pp.

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Appendix 1. Nomenclature of plants and animals recorded on the 1820 Cass expedition.

Expedition's Nomenclature ¹	Current Nomenclature
MAMMALS	
Buffalo ^{abcefg} , <i>Bos Americanus</i> ^b	Bison (<i>Bison bison</i>)
Elk ^{abefgh} , <i>Cervus Canadensis</i> ^b	Elk (<i>Cervus elaphus</i>)
Deer, common deer ^{abefgh} , <i>C. Virginianus</i> ^b	White-tailed deer (<i>Odocoileus virginianus</i>)
Moose ^{abfg} , <i>C. alces</i> ^b	Moose (<i>Alces alces</i>)
Bear, black bear ^{abefgh} , brown bear ^e [?], <i>Ursus Americanus</i> ^b	Black bear (<i>Ursus americanus</i>)
Wolf, gray wolf ^{abg} , <i>Canis vulpes</i> ^b , <i>Canis lupus</i> ^a	Timber wolf (<i>Canis lupus</i>)
Coyote ^e , prairie wolf ^{ac}	Coyote (<i>Canis latrans</i>)
Wolverine ^{abeg} , glutton ^e , hyena ^e , <i>Ursus luscus</i> ^b	Wolverine (<i>Gulo gulo</i>)
Red fox ^{bfg} , silver fox ^a , <i>Canis vulpes</i> ^b	Red fox (<i>Vulpes vulpes</i>)
Gray fox ^g , black fox ^b , <i>Canis argenteus</i> ^b	Gray fox (<i>Urocyon cinereoargenteus</i>)
Badger ^b , <i>Meles labradoria</i> ^b	Badger (<i>Taxidea taxus</i>)
Marten, martin ^{abfg} , <i>Mustela martes</i> ^b	Pine marten (<i>Martes americana</i>)
Fisher ^{bfg} , <i>Martes Pennanti</i> ^b	Fisher (<i>Martes pennanti</i>)
Otter ^{abfg} , <i>Lutra vulgaris</i> ^b	River otter (<i>Lutra canadensis</i>)
Skunk ^g , polecat ^b , <i>Mephitis putorius</i> ^b	Striped skunk (<i>Mephitis mephitis</i>)
Weasel ^b , ermine ^g , <i>Mustela vulgaris</i> ^b	Long-tailed weasel (<i>Mustela frenata</i>) or short-tailed weasel (<i>M. erminea</i>)
Mink ^g , <i>Mustela lutreola</i> ^b	Mink (<i>Mustela vison</i>)
Muskrat ^{abfg} , <i>Fiber vulgaris</i> ^b	Muskrat (<i>Ondatra zibethicus</i>)
Beaver ^{abefgh} , <i>Castor fiber</i> ^b	Beaver (<i>Castor canadensis</i>)
Porcupine ^{abg} , hedgehog ^g , <i>Hystrix cristata</i> ^b	Porcupine (<i>Erethizon dorsatum</i>)
Red squirrel ^{ab} , red barking squirrel ^a , <i>Sciurus vulgaris</i> ^b	Red squirrel (<i>Tamiasciurus hudsonii</i>)
Ground or striped squirrel ^b , red striped squirrel ^e [?], <i>Sciurus striatus</i> ^b	Eastern chipmunk (<i>Tamias striatus</i>)
Squirrel (an apparently new species) ^b , Federation squirrel ^l , <i>Sciurus tridecemlineatus</i> ^l , <i>S. tridecem</i> ^e , striped squirrel	13-lined ground squirrel (<i>Spermophilus tridecemlineatus</i>)
Pouched rat ^{bc} , hamster ^b , gopher ^{acel} , <i>Mus bursarius</i> ^{bl} , gofer ^f	Plains pocket gopher (<i>Geomys bursarius</i>)
Jerboa, jumping mouse ^{bo} , <i>Dipus</i> ^b	Meadow or woodland jumping mouse (<i>Zapus hudsonius</i> , <i>Napeozapus insignis</i>)
Raccoon ^{bfg} , <i>Procyon lotor</i> ^b	Raccoon (<i>Procyon lotor</i>)
Hare ^{be} , brown rabbit ^a , <i>Lepus americanus</i> ^b , rabbit	Snowshoe hare (<i>Lepus americanus</i>)
Rein deer ^{fg}	Woodland caribou (<i>Rangifer tarandus</i>)
Lynx ^{fg} , case cat ^{eg} , loup-cervier ^e	Lynx (<i>Lynx canadensis</i>)
Wood-chuck ^g	Woodchuck (<i>Marmota monax</i>)
BIRDS	
Loon ^{abefg} , water loon ^a	Common Loon (<i>Gavia immer</i>)
Pelican ^{abefg} , white pelican ^a , <i>Pelicanus onocratolus</i> ^a , <i>P. onocratolus</i> ^b	American White Pelican (<i>Pelecanus erythrorhynchos</i>)
Cormorant ^{abfg} , <i>P. carbe</i> ^b	Double-crested Cormorant (<i>Phalacrocorax auritus</i>)
Heron ^{abf} , <i>Ardea</i> ^b	Great Blue Heron (<i>Ardea herodias</i>)
Swan ^{abfg} , good swan ^e , <i>A. cygnus</i> ^b	Trumpeter Swan (<i>Cygnus buccinator</i>), possibly also Tundra Swan (<i>C. columbianus</i>)
Goose ^{ab} , wild goose ^{afg} , <i>An. anser</i> ^b	Canada Goose (<i>Branta canadensis</i>)?
Bustard ^{fg}	Canada Goose
Brant ^{abe} , <i>An. bernicla</i> ^b	???
Wood duck ^g , summer duck ^c , <i>A. sponsa</i> ^c	Wood duck (<i>Aix sponsa</i>)
Black duck ^{ag}	American Black Duck (<i>Anas rubripes</i>)

continued

Appendix 1. (Continued).

Expedition's Nomenclature ¹	Current Nomenclature
French duck ^g	Mallard (<i>Anas platyrhynchos</i>)
Teal ^a	Blue-winged or Green-winged Teal (<i>Anas discors</i> , <i>A. crecca</i>)
Duck (Red-head or Fall) ^b , <i>A. rufus</i> ^b	Redhead (<i>Athya americana</i>)
Duck (saw-bill) ^b , <i>A. tadorna</i> ^b	Common, Red-breasted, or Hooded Merganser (<i>Mergus merganser</i> , <i>M. serrator</i> , <i>Lophodytes cucullatus</i>)
Duck (d. and m.) ^b , <i>Anas</i> ^b	Unidentified duck (Anatidae)
Duck (alewives) ^b	Unidentified duck
Wild duck ^a	Unidentified duck
Turkey-buzzard ^a , buzzard ^a	Turkey Vulture (<i>Cathartes aura</i>)
Fork-tailed hawk ^b , <i>Falco furcatus</i> ^b	American Swallow-tailed Kite (<i>Elanoides forficatus</i>)
Eagle ^a , bald eagle ^{ab} , <i>Falco leucocephalus</i> ^b	Bald Eagle (<i>Haliaeetus leucocephalus</i>)
Pigeon hawk ^b , <i>Falco columbarius</i> ^b	Merlin (<i>Falco columbarius</i>)
Chicken hawk ^b , <i>Falco communis</i> ^b	Peregrine Falcon (<i>Falco peregrinus</i>)?, or Red-tailed Hawk (<i>Buteo jamaicensis</i>)?
Falcon ^{ac}	Unidentified hawk (Falconiiformes), probably Red-tailed Hawk
Hawk ^{ac}	Unidentified hawk
Partridge ^{abfg} , <i>Tetrao</i> ^b , pheasant ^f	Ruffed Grouse (<i>Bonasa umbellus</i>), Spruce Grouse (<i>Dendragapus canadensis</i>), Sharp-tailed Grouse (<i>Tympanuchus phasianellus</i>), possibly Greater Prairie Chicken (<i>Tympanuchus cupido</i>)
Prairie hen ^c	Greater Prairie-Chicken or possibly Sharp-tailed Grouse
Turkey ^b , <i>Meleagris</i> ^b	Wild Turkey (<i>Meleagris gallopavo</i>)
Rail ^{bc}	Unidentified rail (Rallidae)
Crane ^{bh}	Sandhill or Whooping Crane (<i>Grus canadensis</i> , <i>G. americana</i>)
Plover ^{ab} , <i>Charadrius</i> ^b	Unidentified plover (Charadriidae)
Scolipax minor ^c	American Woodcock (<i>Scolopax minor</i>)
Snipe ^{ab} , <i>Scolipax</i> ^b	Unidentified sandpiper or snipe (Scolopacidae)
Gull ^{abce} , gull family ^b , gully ^f	Unidentified gull or tern (Laridae)
Gull [Chicago] ^g	Herring Gull (<i>Larus argentatus</i>)
Gull [Mississippi River] ^{ac} , small white gull [Lake Huron] ^a	Forster's or Common Tern (<i>Sterna forsteri</i> , <i>S. hirundo</i>)
White, robin-sized bird with webbed feet and long bill ^f	Black Tern (<i>Chlidonias niger</i>)
Turtle dove ^a	Mourning Dove (<i>Zenaida macroura</i>)
Pigeon ^{abcefh} , <i>Columba emigratoria</i> ^b	Passenger Pigeon (<i>Ectopistes migratorius</i>)
Great white owl ^{ac} , <i>Strix nyctea</i> ^{ac}	Barred Owl (<i>Strix varia</i>)
Owl ^b	Unidentified owl (Strigiformes)
Whippoorwill ^b , whipporwill ^a , <i>Caprimulgus virginiana</i> ^c , <i>Caprimulgus</i> ^b , <i>C. vociferus</i> ^c	Whip-poor-will (<i>Caprimulgus vociferus</i>)
Kingfisher ^{ab} , <i>Alceda alcyon</i> ^{ac} , <i>Alcedo</i> ^b	Belted Kingfisher (<i>Ceryle alcyon</i>)
Red-headed Woodpecker ^c	Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)
Woodpecker ^b , <i>Picus</i> ^b	Unidentified woodpecker (Picidae)
Jay ^a , blue jay ^{ab}	Blue Jay (<i>Cyanocitta cristata</i>)
Magpie ^b , <i>Corvus pica</i> ^b	Black-billed Magpie (<i>Pica pica</i>)
Crow ^b , <i>Corvus corone</i> ^b	American Crow (<i>Corvus brachyrhynchos</i>)
Raven ^{ab} , <i>Corvus corax</i> ^b	Common Raven (<i>Corvus corax</i>)
Wren ^a	Unidentified wren (Troglodytidae)

continued

Appendix 1. (Continued).

Expedition's Nomenclature ¹	Current Nomenclature
Bluebird ^a	Eastern Bluebird (<i>Sialia sialis</i>)
Robin ^{ab} , <i>T. migratorius</i> ^{ab}	American Robin (<i>Turdus migratorius</i>)
Mockingbird ^{bc} , Mock-bird ^a , <i>Turdus polyglotis</i> ^{bc}	Northern Mockingbird (<i>Mimus polyglottos</i>)
Brown thrasher ^a , brown thrush ^a	Brown Thrasher (<i>Toxostoma rufum</i>)
Small yellow bird ^{ac}	Common Yellowthroat (<i>Geothlypis trichas</i>), Yellow Warbler (<i>Dendroica petechia</i>), or Prothonotary Warbler (<i>Protonotaria citrea</i>)
<i>F. melodia</i> ^c	Song Sparrow (<i>Melospiza melodia</i>)
Blackbird (red-wing species) ^b , blackbird ^a	Red-winged Blackbird (<i>Agelaius phoeniceus</i>)
HERPTILES	
Land tortoise ^{aa}	Wood turtle (<i>Clemmys insculpta</i>)?
Large green tortoise ^a , large green turtle ^b	Snapping turtle (<i>Chelydra serpentina</i>)?
Turtle (water) ^a , (lake) ^b , <i>Chelonia</i> ^b	Unidentified turtle (Testudines)
Turtle (small land) ^b , <i>Chelonia</i> ^b	Unidentified turtle
Anguis ^c , <i>Ophisaurus douglasii</i> ^b	Western slender glass lizard (<i>Ophisaurus a.</i> <i>attenuatus</i>)
Common green snake ^a , <i>Coluber aestivus</i> ^a , striped or garter snake ^{fg} , common garter snake ^a	Garter snake (<i>Thamnophis sirtalis</i> , and possibly <i>T. radix</i> in western areas)
Water snake ^a	Northern banded water snake (<i>Nerodea sipedon</i>)
Rattlesnake [upland] ^{acch} , large rattlesnake ^a , <i>Crotalus horridus</i> ^a	Timber rattlesnake (<i>Crotalus horridus</i>)
Rattlesnake [lowland] ^{ef} , small rattlesnake ^c , prairie rattlesnake ^a	Massasauga (<i>Sistrurus catenatus</i>)
Snake ^b , <i>Ophidia</i> ^b	Unidentified snake (Serpentes)
FISH	
Sturgeon ^{abcefh} , <i>Acipenser oxyrinchus</i> ^c , <i>Acipenser</i> ^b	Lake sturgeon (<i>Acipenser fulvescens</i>); on Mississippi River, maybe also paddlefish or shovelnose sturgeon, <i>Scaphirhynchus</i> <i>platyrhynchus</i>)
Sturgeon ^a (shovelnose ^{ah} , paddle-nose ^b , shovel mouthed ^d), <i>Acipenser spatularia</i> ^{bc} [Mississippi River]	Paddlefish (<i>Polydon spathula</i>)
Gar ^a [Mackinac]	Longnose gar (<i>Lepisosteus osseus</i>)
Eel ^b	American eel (<i>Anguilla rostrata</i>); possibly lampreys (<i>Ichthyomyzon</i> spp., <i>Lampetra</i> <i>appendix</i>)
Trout (speckled) ^b , <i>Salmo</i> ^b	Brook trout (<i>Salvelinus fontinalis</i>)
Salmon trout ^b , <i>Salmo</i> ^b	Lake trout (<i>Salvelinus n. namaycush</i>); possibly including siscowet (<i>S. n. siscowet</i>)
Trout ^{ae}	Brook or lake trout
Whitefish/White fish ^{abcefhg}	Lake whitefish (<i>Coregonus clupeaformis</i>)
Lake herring ^a , tulibee ^b , too-nee-bee/telibee ^{fg}	Cisco (<i>Coregonus</i> spp., probably <i>C. artedii</i>)
Pike ^{efg}	Northern pike (<i>Esox lucius</i>); possibly also walleye (<i>Stizostedion vitreum</i>) or sauger (<i>S.</i> <i>canadense</i>)
Mosquenonge ^a	Muskellunge (<i>Esox masquinongy</i>)
Sucker ^a , carp ^{bfg}	Unidentified sucker/carp (Catostomidae)
Catfish ^{abfg} , <i>Silurus</i> ^b	Channel catfish (<i>Ictalurus punctatus</i>), flathead catfish (<i>Pylodictis olivaris</i>), or bullhead (<i>Ictalurus</i> spp.)
Striped bass ^b	White or yellow bass (<i>Morone chrysops</i> , <i>M. mississippiensis</i>)

continued

Appendix 1. (Continued).

Expedition's Nomenclature ¹	Current Nomenclature
White bass ^a	White bass; in Mississippi, Wisconsin, and Fox rivers possibly also white crappie (<i>Pomoxis annularis</i>)
Black bass ^{a,f,g}	Largemouth and possibly smallmouth bass (<i>Micropterus salmoides</i> , <i>M. dolomieu</i>)
Perch ^a	Yellow perch (<i>Perca flavescens</i>), freshwater drum (<i>Aplodinotus grunniens</i>); possibly walleye or sauger
INSECTS	
Black fly ^{eh} , gnat ^f	Black fly (Simuliidae)
Horse fly ^{eh}	Horse fly, possibly deer fly (Tabanidae)
Sand fly ^{eh}	Stable fly (Muscidae; <i>Stomoxys calcitrans</i>)
Mosquito/musquitoe ^{aceth}	Mosquito (Culicidae)
Firefly ^a	Firefly (Lampyridae)
Ephemera ^a	Mayflies (Ephemeroptera)
MOLLUSCS	
<i>Alasmodonta complanata</i> ⁱ , <i>Symphynota complanata</i> ⁱ	White heel splitter (<i>Lasmigona c. complanata</i>)
<i>Alasmodonta rugosa</i> ⁱ	Squaw foot (<i>Strophitus u. undulatus</i>)?
<i>Alasmodonta undulata</i> ⁱ	<i>Alasmodonta undulata</i> ?
<i>Unio gracilis</i> ^{ci} , <i>U. planus</i> ^{ci} , <i>Symphynota fragilis</i> ⁱ	Fragile paper shell (<i>Leptodea fragilis</i>)
<i>Unio alatus</i> ⁱ	<i>Potamilis alatus</i>
<i>Unio carinatus</i> ⁱ , <i>U. ellipticus</i> ⁱ	Mucket (<i>Actinonaias ligamentina carinata</i>)
<i>Unio cornutus</i> ⁱ	Three horned wartyback (<i>Obliquaria reflexa</i>)
<i>Unio gibbosus</i> ⁱ , <i>U. mucronatus</i> ⁱ	Spike (<i>Elliptio dilatata</i>)
<i>Unio inflatus</i> ⁱ , <i>U. radiatus</i> ⁱ , <i>U. siliquoideus</i> ⁱ	Fat mucket (<i>Lampsilis radiata luteola</i>)
<i>Unio nodosus</i> ⁱ	Monkey face (<i>Quadrula metanevra</i>)
<i>Unio parvus</i> ⁱ	<i>Toxolasma parvus</i>
<i>Unio plicatus</i> ^{ci}	Three ridge (<i>Amblema p. plicata</i>)
<i>Unio praelongus</i> ⁱ	Black sand shell (<i>Ligumia recta</i>)
<i>Unio Schoolcraftensis</i> ^k	Pimple back (<i>Quadrula p. pustulosa</i>)
<i>Unio tuberculatus</i> ⁱ	Buckthorn (<i>Tritogonia verrucosa</i>)
<i>Unio undulatus</i> ⁱ	Wabash pig toe (<i>Fusconaia flava</i>)
<i>Unio ventricosus</i> ^{ci}	Pocketbook (<i>Lampsilis ventricosa</i>)
<i>Unio verrucosus</i> ^{ci}	Purple warty back (<i>Cyclonaias tuberculata</i>)
PLANTS (incomplete; see also Douglass and Torrey 1822)	
Tripe de Roche ^a	Rock tripe (<i>Umbicaria</i> spp.)
Moss ^f	Sphagnum moss (<i>Sphagnum</i> spp.)
<i>Taxus canadensis</i> ^d	Canada Yew (<i>Taxus canadensis</i>)
Tamarack, tamarak ^{ae} , <i>Pinus pendula</i> ^a	Tamarack (<i>Larix laricina</i>)
Yellow pine ^{ach}	Red pine (<i>Pinus resinosa</i>)
Pitch pine ^a , <i>Pinus banksiana</i> ^d	Jack pine (<i>Pinus banksiana</i>)
White pine ^{ach}	White pine (<i>Pinus strobus</i>)
<i>Pinus balsamea</i> ^d	Balsam fir (<i>Abies balsamea</i>)
Hemlock ^{ach} , <i>pinus canadensis</i> ^a	Hemlock (<i>Tsuga canadensis</i>)
Spruce ^a	Black or white spruce (<i>Picea mariana</i> , <i>P. glauca</i>), sometimes maybe also balsam fir
	Black spruce
<i>Pinus nigra</i> ^d	White cedar (<i>Thuja occidentalis</i>)
Cedar ^a [northern areas, swamps, canoe wood]	
<i>Thuja occidentalis</i> ^d	
Cedar ^a [Mississippi River bluffs]	Red cedar (<i>Juniperus virginiana</i>)
<i>Juniperus communis</i> ^d	Ground juniper (<i>Juniperus communis</i>)
Indian potato ^a	Arrowhead (<i>Sagittaria</i> spp.)
Cat-tail ^a	Cattail (<i>Typha</i> spp.)
Aromatic grass ^a , <i>Holcus fragrans</i> ^c	Sweet grass (<i>Hierochloa odorata</i>)

continued

Appendix 1. (Continued).

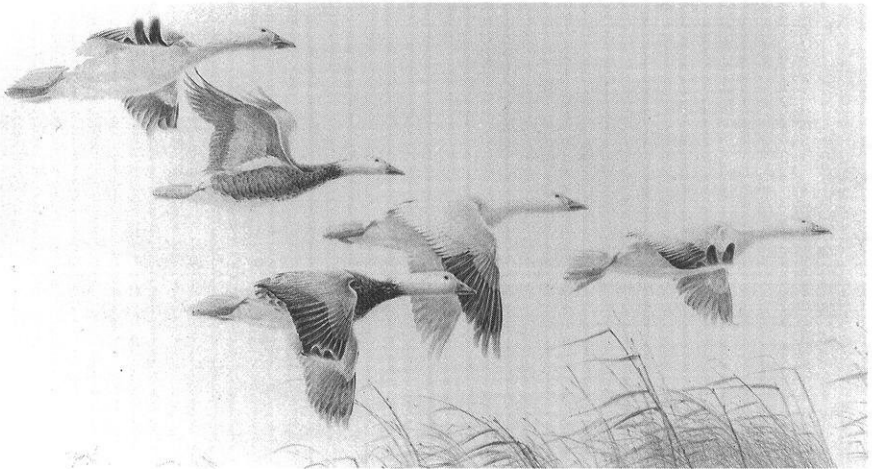
Expedition's Nomenclature ¹	Current Nomenclature
Rice, wild rice ^{acdefgh} , folle avoine ^a , <i>Zizania palustris</i> ^d	Wild rice (<i>Zizania aquatica</i> , <i>Z. palustris</i>)
Scirpus lacustris, bulrushes ^a [Fox River]	Roundstem bulrush (<i>Scirpus acutus</i> , <i>S. validus</i> , or <i>S. heterochaetus</i>)
<i>Tradescantia virginica</i> ^d	Spiderwort (<i>Tradescantia ohimensis</i>)
Asparagus ^a	Asparagus (<i>Asparagus officinalis</i>)
<i>Iris lacustris</i> ^d	Dwarf lake iris (<i>Iris lacustris</i>)
Willows ^a	Willows (<i>Salix</i> spp.)
Aspen ^a , poplar ^{ab} , heart-leaved aspen ^a [?]	Quaking aspen (<i>Populus tremuloides</i>), bigtooth aspen (<i>P. grandidentata</i>), or balsam poplar (<i>P. balsamifera</i>)
Cottonwood ^a , heart-leaved aspen ^a [?], <i>Populus angulata</i> ^a	Cottonwood (<i>Populus deltoides</i>)
Black walnut ^a , <i>Juglans nigra</i> ^c	Black walnut (<i>Juglans nigra</i>)
White walnut ^a	Butternut (<i>Juglans cinerea</i>)
Hickory, common hickory ^a , <i>Juglans vulgaris</i> ^a	Shagbark hickory (<i>Carya ovata</i>)
White birch ^{ab} , <i>Betula papyracea</i> ^a	Paper birch (<i>Betula papyrifera</i>)
Birch ^a	Paper birch or yellow birch (<i>Betula lutea</i>)
Hazel ^c , witch hazel ^a	American hazel (<i>Corylus americana</i>), beaked hazel (<i>C. cornuta</i>)
Black oak ^{ac}	Black oak (<i>Quercus velutina</i>); sometimes perhaps Hill's oak (<i>Q. ellipsoidalis</i>)
White oak ^e , <i>Quercus alba</i> ^d	White oak (<i>Quercus alba</i>)
Red oak ^e	Red oak (<i>Quercus borealis</i>)
Oak ^{acefh}	Oak (<i>Quercus</i> spp.)
Beech ^a , <i>Fagus ferruginea</i> ^d	Beech (<i>Fagus grandifolia</i>)
Elm ^{acof}	American or slippery elm (<i>Ulmus americana</i> , <i>U. rubra</i>)
Common nettle ^a	Stinging nettle (<i>Urtica dioica</i>), possibly wood nettle (<i>Laportea canadensis</i>)
<i>Comandra umbellata</i> ^d	Bastard-toadflax (<i>Comandra umbellata</i>)
Owl's mockasin, <i>Sarracenia purpurea</i> ^d	Pitcher plant (<i>Sarracenia purpurea</i>)
Mulberry ^a [Lake Superior]	Thimbleberry (<i>Rubus parviflorus</i>)?
Blackberry ^a	Blackberry (<i>Rubus allegheniensis</i> , etc.)
Red raspberry ^a , common red raspberry ^c	Red raspberry (<i>Rubus strigosus</i>)
Small red raspberry ^a	Dwarf raspberry (<i>Rubus pubescens</i>)
Little rose ^e , <i>Rosa parviflora</i> ^{cd} [shores]	Wild rose (<i>Rosa acicularis</i> , <i>R. blanda</i>)
Wild cherry ^{ac}	Cherry (<i>Prunus</i> spp.)
Blue pea ^e , <i>Pisum maritimum</i> ^d	Beach pea (<i>Lathyrus japonicus</i>)
Sumach ^a	Smooth or staghorn sumac (<i>Rhus glabra</i> , <i>R. typhina</i>)
Maple ^{ac} , sugar tree ^a	Maple (<i>Acer saccharum</i> , <i>A. rubrum</i> , <i>A. saccharinum</i>)
Maple bush ^a , <i>Acer spicatum</i> ^a , rough-leaved maple ^a [?]	Mountain maple (<i>A. spicatum</i>); in (a), apparently mistaken for red-osier dogwood (<i>Cornus stolonifera</i>)
Box elder ^a , ash-leaved maple ^a , <i>Acer negundo</i> ^a	Box elder (<i>Acer negundo</i>)
Lind ^a , whitewood ^a	Basswood (<i>Tilia americana</i>)
Sarsaparilla ^a , <i>Aralia nudicaulis</i> ^a	Sarsaparilla (<i>Aralia nudicaulis</i>)
Ginseng ^a	Ginseng (<i>Panax quinquefolius</i>)
<i>Cornus florida</i> ^a	Unidentified dogwood shrub (<i>Cornus</i> spp.), but not <i>C. florida</i>
Labrador tea ^{ad} , <i>Ledum latifolium</i> ^{ad} , <i>L. latifolia</i> ^a	Labrador tea (<i>Ledum groenlandicum</i>)
<i>Kalmia glauca</i> ^d	Bog laurel (<i>Kalmia polifolia</i>)
Wintergreen ^a	Wintergreen (<i>Gaultheria procumbens</i>)

continued

Appendix 1. (Continued).

Expedition's Nomenclature ¹	Current Nomenclature
Kinni-kinnic, kinnikinick, etc. ^{a,c,d} , <i>Arbutus uva ursi</i> ^d , <i>uva ursi</i> ^c	Bearberry (<i>Arctostaphylos uva-ursi</i>)
Whortle berry ^a	Blueberry (<i>Vaccinium</i> spp.)
Cranberry ^a , <i>Oxycoccus macrocarpus</i> ^a	Cranberry (<i>Vaccinium macrocarpon</i>)
Smallbush whortle berry (<i>Vaccinium dumosum</i>) ^a	Huckleberry (<i>Gaylussacia baccata</i>)
Ash ^a	Ash (<i>Fraxinus</i> spp.)
<i>Menyanthes trifoliata</i> ^d	Bog bean (<i>Menyanthes trifoliata</i>)
<i>Ipomea nil</i> ^c	Bindweed (<i>Convolvulus</i> spp.)?
<i>Liatris squarrosa</i> ^d	Blazing star (<i>Liatris cylindracea</i> ?)
<i>Liatris scariosa</i> ^d	Blazing star (<i>Liatris aspera</i> ?)

¹Sources are indicated by superscripts: ^aSchoolcraft (1821a), ^bSchoolcraft (1855), ^cSchoolcraft (1855), ^dDouglass and Torrey (1822), ^eDouglass (1969), ^fTrowbridge (1942), ^gDoty (1876), ^hDoty (1895), ⁱBarnes (1823), ^jLea (1830), ^kLea (1837), ^lMitchill (1821), ^mMitchill (1822a), ⁿMitchill (1822b), ^oSchoolcraft (1834), ^pAnonymous (1823)



"Snows and Blues" by Martin R. Murk (S66 W38205 Hwy. ZZ, Eagle, WI 53119).

The Summer Season: 1991

by Thomas K. Soulen

The summer's weather elicited relatively little comment from 1991 observers. Some thought that high water in their areas contributed to poor nesting success of water/marsh birds. Although there were both high (90's to 100 degrees) and low (30's to low 40's) temperatures somewhere in the state during a number of weeks, there were no prolonged periods of temperature extremes. Showers occurred with some regularity through much of the summer, with localized areas occasionally experiencing as much as 3–5 inches of rain. Very strong winds did considerable damage in southern Wisconsin July 7, including many downed trees in the Lake Mills area. Several observers commented on increased rainfall the latter half of July.

Although descriptions of the passage of weather systems during the latter half of July don't suggest conditions that should have highlighted obvious large-scale migratory movement, some contributors reported such activity. The Engbergs noted significant warbler migration in Oneida Co. July 17–20, mostly immatures, and Ellen Hansen observed a

variety of species—including martins and kingbirds—that appeared to be moving around or migrating in the Madison area by the third week of July. The seasonal summary below details the usual reports of particular late spring and early fall migrants. It seems that this year people reported a greater variety of early fall migrants, especially during the last week in July.

Wisconsin observers found a total of 255 species during the season. The report that follows gives information on 145 of them. An additional 79 were common and widespread enough to be reported from more than 25 counties and are not included in the listings below. The remaining 31 species, reported from 10–25 counties, are listed here along with the number of counties in which each was recorded: Pied-billed Grebe (22), Double-crested Cormorant (20), American Bittern (17), Least Bittern (10), Green-winged Teal (16), American Black Duck (11), Hooded Merganser (17), Bald Eagle (18), Cooper's Hawk (23), Broad-winged Hawk (17), Ruffed Grouse (24), Virginia Rail (15), Sora (22), American Coot (18), Upland Sandpi-

per (14), Common Snipe (21), American Woodcock (18), Herring Gull (13), Caspian Tern (12), Common Tern (10), Forster's Tern (10), Barred Owl (18), Whip-poor-will (18), Yellow-bellied Sapsucker (25), Hermit Thrush (14), Golden-winged Warbler (15), Northern Parula Warbler (10), Grasshopper Sparrow (25), Western Meadowlark (25), Brewer's Blackbird (20), and Evening Grosbeak (11).

Among the season's rarities were several that were particularly noteworthy. An Iceland Gull in Manitowoc provided Wisconsin's first summer record, and a Lark Bunting in Marathon Co. was only the fourth record for this season. A Common Black-headed Gull appeared in Manitowoc for the second year in a row and Wisconsin's third summer record overall. Great Gray Owls were located for the third summer in a row, again in Douglas Co. A Chuck-will's-widow that serenaded a number of birders in Oconto Co. and Yellow-throated Warblers in Grant and Sheboygan Counties represented new summer locations for these species. And once again a Kirtland's Warbler was present in Jackson Co. Additional unusual species included Eared Grebe, Western Grebe, American White Pelican, Snowy Egret, Yellow-crowned Night-Heron, Oldsquaw, Willet, Whimbrel, Laughing Gull, Little Gull, Black-backed Woodpecker, Carolina Wren, Northern Mockingbird, White-eyed Vireo, Philadelphia Vireo, and Sharp-tailed Sparrow.

Rarity of a different kind is represented by common migrants that appear far from normal range, such as the Black-throated Green Warbler and Golden-crowned Kinglet discovered July 2 in pine plantations in the Kettle Moraine State Forest in Waukesha Co.

These pines have yielded quite a variety of northern species in recent summers and warrant more extensive exploration. A singing male Wilson's Warbler present at least July 4-6 in Oneida Co. represents one of very few summer records. No previous Wisconsin report has come from a date so squarely in the middle of the season.

Only 3 species were reported by at least 3 observers to be more common this year than last: Eastern Bluebird, Dickcissel and House Finch. On the other hand, no less than 31 species were stated by at least 3 observers to be absent or less common than last year (italicized species were reported to be less common by at least 6 observers): Great Blue Heron, *Green-backed Heron*, *Blue-winged Teal*, Broad-winged Hawk, Ruffed Grouse, American Coot, Killdeer, Black Tern, Black-billed Cuckoo, Yellow-billed Cuckoo, *Common Nighthawk*, *Belted Kingfisher*, Red-headed Woodpecker, Red-bellied Woodpecker, Yellow-bellied Sapsucker, Hairy Woodpecker, Northern Flicker, Pileated Woodpecker, Purple Martin, Tree Swallow, Cliff Swallow, Wood Thrush, Brown Thrasher, Ovenbird, Scarlet Tanager, Rufous-sided Towhee, Field Sparrow, Savannah Sparrow, *Bobolink*, Eastern Meadowlark, and *Northern Oriole*. Among the years since 1983 (when appreciable numbers of observers first started reporting their impression of changes in abundance of at least some species), only last year produced a longer list (37) of "less common" species.

Several particularly active and wide-ranging new observers gave more coverage from some parts of the state than usual. Overall, however, the number of contributors (61) was lower than usual, and 11 counties were represented by

no reports: Door, Florence, Iron, Juneau, Kenosha, Kewaunee, Marquette, Racine, Rusk, Waushara and Wood. We've slipped a little in the last few years. Let's see if we can improve our summer coverage of the state.

REPORTS (JUNE 1–JULY 31, 1991)

Common Loon.—The June 22 observation in Jackson Co. (Robbins) was the southernmost. Noted in 14 counties overall.

Red-necked Grebe.—The highest number observed in the Rush Lake, Winnebago Co. population this year was 60, on June 16; of these, 18 were young (Ziebell). Bred also in Dunn Co., fledging at least one young (Polk). Several observers reported birds on Lake Maria, Green Lake Co., with Schultz counting 14 there on July 27. No evidence of nesting was noted with birds seen in St. Croix (Bernier) and Taylor (Armbrust) Counties in June.

Eared Grebe.—Two birds present at Rush Lake, Winnebago Co. remained through June 25 (Ziebell).

Western Grebe.—After last season's first successful Wisconsin nesting at Rush Lake, Winnebago Co., many wondered whether this year would provide a repeat. Ziebell found a nest with 2 eggs on June 16, but it had been destroyed by June 25, and the two birds were not seen after that date.

American White Pelican.—Two birds present in Brown Co. were noted by several observers, last on July 7 (Tessen). Observed also in Milwaukee Co. July 22 (Domagalski).

Great Egret.—The most northerly counties in which this species was noted in the central and eastern part of the state were these: Marathon June 8 (Belter), Oconto June 23 (Smiths) and Taylor June 2–4 (Armbrust). Noted in 17 counties overall.

Snowy Egret.—Up to five birds were seen by a number of observers at the Barkhausen Preserve in Brown Co., last on July 13 (Burcar, Domagalski). Also noted in Manitowoc Co. July

2 (Sontag) and Oconto Co. June 4–23 (the Smiths).

Cattle Egret.—Reported from Brown Co. between June 8 and July 7 (Domagalski, Soulen, and Tessen, who reported 15 birds on June 8).

Black-crowned Night-Heron.—Korducki counted 53 birds in Milwaukee Co. July 22. Observed in 13 counties overall.

Yellow-crowned Night-Heron.—An adult was observed carefully in Brown Co. June 2 (Korducki). Woodmansee also reported this species there June 6. Leglers heard a bird at the Avon Bottoms in Rock Co. June 17.

Tundra Swan.—Present in the Ashland/Bayfield Co. area throughout the season (Verch).

Mute Swan.—Two of the nine counties in which this species was noted—Lafayette (Burcar, Frank) and Milwaukee (Boldt, Domagalski)—represent locations from which observers have not reported summer sightings for at least the past decade.

Northern Pintail.—This summer's observations were in Brown, Green Lake, Manitowoc, Marathon, Milwaukee and Winnebago Counties.

Northern Shoveler.—Noted in these 9 counties: Brown, Dane, Dodge, Green Lake, Marathon, Oconto, St. Croix, Taylor and Winnebago.

Gadwall.—Observers found these in Brown, Dodge, Green Lake, Manitowoc, Marathon, Milwaukee, Oconto and Winnebago Counties.

American Wigeon.—Recorded in Ashland/Bayfield, Brown, Burnett, Dane, Dodge, Green Lake, Oconto, Vilas and Winnebago Counties.

Canvasback.—The season's only report was of a lone bird in Ozaukee Co. June 30 (Green).

Redhead.—Noted in 7 counties: Brown, Dane, Dodge, Green Lake, Manitowoc, Milwaukee and Winnebago.

Ring-necked Duck.—Observers reported this species from Burnett, Columbia, Dane, Douglas, Green Lake, Manitowoc, Marathon, Monroe and Vilas Counties.

Greater Scaup.—One remained in Manitowoc Co. at least until July 11 (Sontag).

Lesser Scaup.—Birds were noted in Ashland/Bayfield, Dane, Green Lake, Manitowoc, Milwaukee, Sheboygan and Winnebago Counties.

Oldsquaw.—An individual in Manitowoc Co. June 4 was very unusual (Sontag).

Bufflehead.—There were two reports: Dodge Co. June 20 (Haseleu) and Taylor Co. through June 12 (Armbrust).

Common Merganser.—Noted in Ashland/Bayfield, Chippewa, Douglas, Forest, Marathon, Taylor and Vilas Counties.

Red-breasted Merganser.—Reported from Ashland/Bayfield, Manitowoc, Milwaukee, Oneida and Ozaukee Counties.

Ruddy Duck.—Observed in Columbia, Dane, Dodge, Dunn, Green Lake, Manitowoc, Milwaukee, Sheboygan and Winnebago (102 on June 16; Ziebell) Counties.

Osprey.—Could birds in Dane Co. July 24 and Sauk Co. July 25 (Burcar) have been migrants? The most southerly other reports came from Adams and La Crosse Counties June 18 (Tessen), Lafayette Co. June 11 (Frank), Manitowoc Co. throughout the period (Sontag), Monroe Co. June 22 (Robbins), Ozaukee Co. June 2 (Diehl), and Winnebago Co. July 6 (Domagalski). Noted in 15 additional counties.

Sharp-shinned Hawk.—Observed in Adams Co. July 28, Dane Co. July 9–23, and Iowa Co. July 9 (Burcar); Calumet Co. throughout the period (Rudy); and Walworth Co. June 24 through July 26 (Parsons). Also noted in 11 northern counties.

Northern Goshawk.—Reported from these counties: Douglas (Burcar, Johnson, Semo), Marathon (Belter, Hoeft), Menominee

(Hoffman, 4 on June 14), Oconto (the Smiths), Taylor (Risch), and Vilas (Burcar, Spahn).

Red-shouldered Hawk.—This year's most northern reporting counties were Forest (Reardon), Menominee (Hoffman), Oconto (Smiths) and Vilas (Schultz). Also noted in 14 more southern counties.

Merlin.—Present throughout the period in the Ashland/Bayfield Co. area (Verch) and Douglas Co. (Semo) and during the first part of the season in Oneida Co. (the Engbergs).

Peregrine Falcon.—Again, the summer reports came from Dane and Milwaukee Counties, the sites of release programs.

Gray Partridge.—Noted in Green Co. June 11 (the Leglers) and throughout the period in Marinette Co. (Lindberg). This represents the lowest number of reporting counties for this species in at least 10 years.

Spruce Grouse.—None were reported this year.

Greater Prairie-Chicken.—Observed in Marathon (Belter), Portage (Burcar) and Taylor (Armbrust) Counties.

Sharp-tailed Grouse.—Noted only in Taylor Co. (Armbrust, Bradley).

Wild Turkey.—This year's observations came from these counties: Calumet, Dane, Grant, Green Lake, Iowa, Lafayette, Marinette, Monroe, Polk, Richland, Sauk, Walworth and Waukesha Counties. Parsons reported that others counted 58 in one field in Walworth Co.

Northern Bobwhite.—Risch wondered whether a bird in western Taylor Co. might have been released there. Might that also have been the case with a bird in Oconto Co. June 9 (Tessen)? Also noted in 15 additional counties within normal range.

Yellow Rail.—There were no reports of this species this summer.

King Rail.—Reported only June 6 in Dane Co. (the Leglers).

Common Moorhen.—Observed in Brown, Columbia, Dodge, Jefferson, Marathon, Oconto, Waukesha and Winnebago Counties.

Sandhill Crane.—Belter found 57 in Marathon Co. June 1, and Ziebell observed 34 in Winnebago Co. June 5. Noted in 30 mostly eastern or northern counties overall.

Black-bellied Plover.—Birds remained in Ashland/Bayfield Counties through June 4 (Verch) and Manitowoc Co. until June 6 (Sontag). Returning birds were noted in Douglas Co. July 27 (Johnson) and Milwaukee Co. July 29 (Domagalski, Korducki).

Semipalmated Plover.—Present continuously in Manitowoc Co. (Sontag). Elsewhere, the latest straggler was in Milwaukee Co. June 13 (Domagalski), with returning birds appearing in Oconto Co. July 10 (the Smiths), Marathon Co. July 14 (Belter), and in 4 additional counties within the next week.

Piping Plover.—For the third consecutive summer, there were no reports of this species.

Greater Yellowlegs.—The earliest fall migrant was noted in Winnebago Co. June 25 (Ziebell). The next birds appeared in Brown Co. June 29 (Soulen), Dodge Co. July 5 (Domagalski) and Marathon Co. July 6 (Belter).

Lesser Yellowlegs.—Stragglers remained in Dodge Co. until June 1 (Domagalski) and in Dane Co. through June 3 (Burcar). The first report of returning birds came from Dane Co. June 23 (Hansen), with observations from 4 additional counties before the end of June.

Solitary Sandpiper.—Reported from Dane Co. through June 3 (Burcar) and Marathon Co. in early June (Belter). Fall migrants appeared in 3 counties June 29–30.

Willet.—Noted in Douglas Co. June 27 (Johnson) and Milwaukee Co. June 26 (Boldt, Domagalski) and July 20 (Korducki).

Whimbrel.—Single birds were reported from these counties: Ashland/Bayfield June 3–6 (Verch, Tom Syverud fide Verch), Manitowoc through June 6 (Sontag), and Sheboygan June 22 (the Brassers, Domagalski).

Ruddy Turnstone.—Remained until June 22 in Milwaukee Co. (Boldt) and in Manitowoc Co., where 175 were present June 1 (Sontag). Fall migrants were noted in Milwaukee Co. by July 6 (Korducki) and Sheboygan Co. by July 26 (the Brassers).

Red Knot.—A bird remained in Manitowoc Co. through June 2 (Sontag).

Sanderling.—Noted in 4 counties June 1–5. Birds were in Milwaukee Co. June 11 (Boldt, Domagalski) and 20 (Korducki), but no more were reported until July 22 in Manitowoc Co. (Robbins, Sontag) and July 26 in Sheboygan Co. (the Brassers).

Semipalmated Sandpiper.—Although the latest spring migrants were noted in Manitowoc Co. June 17 (Sontag), it was less than a week later (June 23) that fall migrants appeared in Dane Co. (Hansen), with birds appearing in 2 additional counties before the end of June.

Least Sandpiper.—Noted in 4 counties in early June, latest in Manitowoc Co. on the 5th (Sontag). Not clearly identifiable as a spring or fall migrant was a bird in Milwaukee Co. June 15 (Korducki). Fall migrants had appeared in Dane (Hansen) and Milwaukee (Boldt, Domagalski) Counties by June 23 and in 2 additional counties before the end of June.

White-rumped Sandpiper.—Late spring migrants in Dane Co. June 1 (Ashman) and Manitowoc Co. June 17 (Sontag) were not unusual, but a June 27 report from Milwaukee Co. was very late (Domagalski). Noted also in Dodge Co. July 9 (Robbins).

Baird's Sandpiper.—Reported from Dodge Co. July 13 (Burcar), St. Croix Co. July 17 (13 birds) and July 30–31 (Berner), Dane (Robbins) and Douglas (Johnson) Counties July 20, and Milwaukee Co. from July 26 on (several observers).

Pectoral Sandpiper.—Present until June 3 in Dane Co. (Burcar). Had returned to 3 locations by July 8–10, although most fall migrants were not noted until at least a week later.

Dunlin.—This species can be one of our most extreme spring stragglers. Birds in Sheboygan Co. June 22 (Domagalski) and Manito-

woc Co. June 25 (Sontag) were late, but not as late as one in Milwaukee Co. July 8 (Korducki)!

Stilt Sandpiper.—Present in Dane Co. through June 3 (Burcar). Fall migrants had appeared by July 7 in Milwaukee Co. (Boldt), July 9 in Dodge Co. (Robbins), July 17 in St. Croix Co. (Berner), and July 19 in Dane Co. (Burcar).

Dowitcher sp.—Again this year, few contributors provided documentation of their dowitcher observations; only 4 of 16 reports were documented. Until more individuals comment on call notes or plumage characteristics, we will remain uncertain about the migratory status of these two species.

Short-billed Dowitcher.—Returning birds were reported from Milwaukee Co. June 24 (Boldt) and Manitowoc Co. June 30 (Sontag)

Long-billed Dowitcher.—The only 2 reports came from Milwaukee Co. July 2 (Bradley) and Manitowoc Co. July 7 (Tessen).

Wilson's Phalarope.—Although there were June reports from several locations, most observations came from July, and most of those likely were of migrants. Noted in 7 counties overall.

Laughing Gull.—Noted by a number of observers through much of the season in both Manitowoc and Milwaukee Counties. Peak numbers were reported June 29 in Manitowoc Co. (4; Sontag, Soulen) and July 1 and 20 in Milwaukee Co. (6; Korducki).

Franklin's Gull.—Appeared in Manitowoc Co. June 12 (Sontag), Milwaukee Co. June 15 (Korducki), and the Ashland/Bayfield Co. area June 16 (Verch), with reports well into July coming from all three locations (several observers).

Little Gull.—After several summers of much lower numbers, Sontag recorded no less than 16 on June 24 in Manitowoc Co., where the species remained throughout the season.

Common Black-headed Gull.—For the second summer in a row, a bird appeared in Manitowoc Co., this year June 11–13 (Sontag). Wisconsin's only other summer report also came from this same harbor, in 1983. Accepted by the

Records Committee. See "By the Wayside." This summer's bird was also reported by the Leglers.

Bonaparte's Gull.—Had left Green Lake Co. by June 3 (Schultz) and the Ashland/Bayfield Co. area by June 6 (Verch). Later June and/or July records came from Douglas, Manitowoc, Milwaukee, Ozaukee and Sheboygan Counties.

Iceland Gull.—A bird in Manitowoc Co. at least through June 29 provided Wisconsin's first summer record of this species (Sontag). Accepted by the Records Committee. See "By the Wayside."

Yellow-billed Cuckoo.—The northernmost of the 25 counties in which this species was noted were Burnett, Douglas, Polk, Taylor, Vilas and Washburn.

Eastern Screech-Owl.—Reported only from Calumet, Dane, Milwaukee, Oneida, Portage, Richland, Taylor, Walworth and Winnebago Counties.

Great Gray Owl.—Reported from Douglas Co. for the third summer in a row, June 20 through July 16 (2 birds; Semo, Mike Cramey, David Epperly, Mark Radzak). Accepted by the Records Committee. See "By the Wayside."

Long-eared Owl.—Three were noted in Taylor Co. on June 13 (Risch); reported from there through the rest of the season (Armbrust).

Short-eared Owl.—Present through the season in Calumet Co. (Rudy).

Northern Saw-whet Owl.—Noted only in Douglas (Semo) and Taylor (Armbrust, Risch) Counties.

Chuck-will's-widow.—An obliging bird in Oconto Co.—a new summer location—was heard in June by Peterson, the Smiths and Tessen and on July 13 by Burcar and Domagalski. See "By the Wayside" for 3 reports accepted by the Records Committee.

Black-backed Woodpecker.—Observed in Douglas Co. June 27 (Burcar), Menominee Co. June 13 (Hoffman; 2 birds), and Oneida Co. July 25 (Tessen). Tacke and a group of UW-Superior Extension course students observed a

male feeding at least one young in a nest cavity in Forest Co. June 18.

Olive-sided Flycatcher.—A spring straggler was in Waupaca Co. June 7 (Tessen). More unusual was a bird in Portage Co. June 17–24 (Berner). Reports from Bayfield, Douglas, Forest, Menominee and Vilas Counties represented more usual summer range. A July 28 Adams Co. bird likely was a fall migrant (Burcar).

Yellow-bellied Flycatcher.—Lingering spring migrants were present in several southern counties in early June. But what was a bird doing in Milwaukee Co. June 22 (Zehner)? Noted also in these northern counties: Douglas, Oconto, Vilas, and Washburn.

Acadian Flycatcher.—Hoffman found a bird June 13 in Menominee Co., decidedly north of this species' usual summer range; he also tallied 23 individuals in Sheboygan Co. June 12. Noted also in 12 additional southern counties.

Gray Jay.—Observers reported these only from Douglas, Forest, Price and Vilas Counties.

Common Raven.—Out of the 20 counties in which this species was noted, the most southern were Brown, Jackson, Monroe, Polk, Portage, Sheboygan and Waupaca.

Boreal Chickadee.—Noted in Forest (Hoffman, Soulen, Tessen), Oneida (Burcar) and Vilas (Spahn) Counties.

Tufted Titmouse.—Observations this season came from Dane, Grant, Iowa, Richland, Rock and Sauk Counties.

Red-breasted Nuthatch.—Noted through June 12 in Green Lake Co. (Schultz); on several June and July dates in Milwaukee Co. (several observers), with a maximum of 3 birds on July 5 (Bontly); and throughout the season in Dane Co. (Ashman). A July 25 bird in Walworth Co. likely was a migrant (Parsons). Recorded also in 19 additional, considerably more northern counties.

Brown Creeper.—Two were observed through June 6 in Portage Co. (Berner); also present through June 16 in Outagamie Co. (Anderson, Petznick) and noted in Manitowoc Co.

June 16 (Burcar). Recorded also in 10 northern counties.

Carolina Wren.—The season's only report was of a bird in Walworth Co. July 31 (Parsons).

Winter Wren.—Most unusual was a July 12 report from Dane Co. (Robbins). Two were present through the season in Calumet Co. (Rudy), and up to three spent the summer in Portage Co. (Berner). Also noted on June 3 in Fond du Lac Co. (Rudy). Other central and southern reports came from Manitowoc and Sauk (Burcar) and Grant (Burcar, Domagalski) Counties. Noted also in 15 more northern counties.

Sedge Wren.—High counts were 50 in Winnebago Co. June 11 (Ziebell) and over 200 in Vilas Co. July 10 (Spahn).

Marsh Wren.—Ziebell counted 334 in Winnebago Co. June 16.

Golden-crowned Kinglet.—The first summer report from a southern location in a number of years was of a bird heard and seen well in the Kettle Moraine State Forest in Waukesha Co. July 2 (Burcar). Also noted in Burnett, Douglas, Forest, Oconto, Oneida, Taylor, Vilas and Washburn Counties.

Ruby-crowned Kinglet.—A bird heard but not seen well in Grant Co. June 11 was unusual (the Leglers). Reported also from Douglas, Forest, Oconto and Vilas Counties.

Blue-gray Gnatcatcher.—Up to 3 were observed during the season in Marathon Co. (Belter, Hoeft) and 9 in Oconto Co. (the Smiths), the farthest north this species was noted in eastern Wisconsin. Reported from an additional 29 counties, mostly southern.

Eastern Bluebird.—Hudick reported an unusually large number in Polk Co., and Parsons banded over 200 (her highest total ever) in Walworth Co.

Swainson's Thrush.—Still present in Milwaukee Co. June 1 (Woodmansee, Zehner). Fall migrants had appeared in Dane Co. by July 27 (Robbins). Breeding range observations came from Forest, Menominee and Vilas Counties.

Northern Mockingbird.—An obliging Ozaukee Co. bird was seen and/or heard by a number of observers between June 16 (Domagalski) and July 7 (Tessen). Also reported from Sheboygan Co. June 29 (the Brassers).

Loggerhead Shrike.—Oconto Co. produced two nests, and up to 14 birds were seen there through most of the period by a number of observers. A pair was at a nest in Green Co. June 10, but the nest was gone June 17 (Hoffman). Another bird was seen in Waupaca Co. June 7 (Tessen). A bird in Forest Co. June 9 was most unusual (Woodmansee).

White-eyed Vireo.—The Leglers found this species in the Albany Wildlife Area in Green Co. June 1–9; it was noted there also by Burcar, who located a second bird in Grant Co. July 21.

Bell's Vireo.—Found in Lafayette and Iowa Counties July 17–18 (Burcar) and also in Grant and Green Counties, mostly in July (several observers).

Solitary Vireo.—Present in Jackson Co. (Robbins, June 22) for the third time in the past 6 years. Also noted in Ashland, Bayfield, Douglas, Forest, Menominee and Oconto Counties.

Yellow-throated Vireo.—Reports came from Bayfield, Douglas, Vilas and 32 more southern counties.

Philadelphia Vireo.—It is known that some individuals of this species can migrate very late. One was well documented on June 7 in the Atkinson Marsh, Brown Co. (Schultz).

Brewster's Warbler.—This hybrid was noted June 24–25 in Grant Co. (Cederstrom).

Blue-winged Warbler.—Berner noted up to 5 in Portage Co., and Peterson reported one in Shawano Co. June 2. The other 12 reporting counties were more southern or western. A nest was found in Milwaukee Co. (Coward).

Tennessee Warbler.—A bird in Oconto Co. June 16 was unusual (the Smiths). Other reports represent likely migrants (very early June or late July), with birds noted in 4 scattered counties July 24–27.

Nashville Warbler.—Might a July 17 bird in Lafayette Co. (Burcar) have been an extremely

early migrant? The other 16 reporting counties were within normal breeding range.

Chesnut-sided Warbler.—Southern counties providing records were Columbia June 1 (Ashman), Dane June 17 (Robbins), Milwaukee June 2 (Zehner), and Waukesha June 21 (Boldt). Other reports came from 18 more northern counties.

Magnolia Warbler.—Birds were present in Jefferson Co. June 1 (Hale) and Milwaukee Co. June 15 (Woodmansee). Also noted in 7 northern counties.

Cape May Warbler.—Birds remained in Taylor Co. through June 4 (Armbrust) and in Fond du Lac Co. through June 5 (Rudy). Are summering birds sometimes present farther south than we think, or were birds in Menominee Co. June 13 (Hoffman) and Oconto Co. June 23 (the Smiths, 2 birds) just very late? And what do we make of a July 7 report from Marathon Co. (Hoeft)? Perhaps more extensive searching would expand the known summer range of this species. Noted also in Douglas and Vilas Counties.

Black-throated Blue Warbler.—Five birds each were noted in Menominee Co. June 14 (Hoffman) and Vilas Co. June 23 (Schultz). A July 3 bird in Marathon Co. (Hoeft) was a bit outside of the usually reported summer range. Records came also from Forest, Oconto and Oneida Counties.

Yellow-rumped Warbler.—At least 6 singing males were in Portage Co. (Berner). Birds in Manitowoc Co. June 16 and Lafayette Co. July 17 might have been very late and early migrants, respectively (Burcar). All other reports came from well within normal breeding range.

Black-throated Green Warbler.—The most southerly report was of a singing male seen well in the Kettle Moraine State Forest in Waukesha Co. (July 2, Burcar). Also noted in Manitowoc (June 16, Burcar) and Sheboygan (June 22, Domagalski) and 12 more northern counties.

Blackburnian Warbler.—Noted in only 9 counties overall, Sauk being the southernmost (Burcar).

Yellow-throated Warbler.—This species appeared in two new summer locations this season: July 1 (Soulen; 2 singing males) through 18

(Burcar) at Wyalusing State Park, Grant Co. (also observed there by Domagalski) and June 20 (Korducki) through July 4 (the Brassers) at Kohler-Andrae State Park, Sheboygan Co. (also reported from there by Burcar, Domagalski and Soulen). Also heard June 17 in its usual haunts along the Sugar River in the Avon Bottoms, Rock Co. (the Leglers).

Pine Warbler.—Found in Jackson (Robbins), Manitowoc (Burcar), Sheboygan (many observers), and Waukesha (Boldt) Counties, as well as 13 more northern counties.

Kirtland's Warbler.—Polk reported that according to Wes Jones, one individual was present through much of June in Jackson Co.

Palm Warbler.—Noted through July 13 in Douglas Co. (Johnson) and on June 25 (Burcar) and July 18 (the Engbergs) in Oneida Co. and July 7 in Vilas Co. (Spahn, 5 birds).

Bay-breasted Warbler.—A bird was present June 1 in Milwaukee Co. (Korducki) and at both beginning and end of the period in Taylor Co. (Armbrust). A June 27 observation in Oneida Co. was very unusual (the Engbergs).

Cerulean Warbler.—Hoffman counted 12 in Sheboygan Co. on June 12, and Cederstrom recorded a like number in Grant Co. on June 17. Noted also in Calumet, Dane, Grant, Green Lake, Iowa, La Crosse, Monroe, Polk, Rock and Sauk Counties.

Black-and-White Warbler.—Most southern of the 20 reporting counties were Green Lake (Schultz), Jackson (Robbins), Monroe (Epstein) and Sauk (Burcar).

Prothonotary Warbler.—Observations came from Buffalo, Grant, La Crosse, Monroe, Polk and Vernon Counties.

Worm-eating Warbler.—The summer's only report was from Sauk Co. June 10 (Burcar).

Northern Waterthrush.—Noted June 5 in Fond du Lac Co. (Rudy, 6 birds), June 16 in Manitowoc Co. (Burcar), and June 18 in Winnebago Co. (Tessen), as well as in 11 more northern counties.

Louisiana Waterthrush.—Reported from Dane Co. June 11 through July 9 (Burcar),

Grant Co. June 17–24 (Cederstrom) and Sauk Co. (Burcar, Hansen, the Leglers).

Kentucky Warbler.—Present through June 13 in Dane Co. and on June 15 in Manitowoc Co. (Burcar). One was in Fond du Lac Co. June 5 (Rudy). Reported by several observers from Grant Co., where Burcar counted 16 on July 18.

Connecticut Warbler.—Five were in Jackson Co. June 11 and seven on June 27 (Berner). Johnson counted 59 in Douglas Co. June 22. Also noted in Ashland/Bayfield, Oneida, Price and Vilas Counties.

Mourning Warbler.—The southernmost reports came from Green Co. June 15 (Burcar) and Walworth Co. June 23 (Frank). There were the usual scattered other southern observations, but most of the remaining 30 reporting counties were considerably more northern.

Hooded Warbler.—Noted in these counties: Green June 12 (Robbins), Manitowoc June 13 (the Leglers), Sheboygan June 12 (Hoffman, 6 birds), and Waukesha July 2 (Burcar).

Wilson's Warbler.—Still in Douglas Co. June 1 (Johnson). Quite remarkable was a male seen at close range and heard singing in Oneida Co. July 4 and 6 (Spahn).

Canada Warbler.—This summer's reports came from Bayfield, Burnett, Dane (Burcar, July 1), Douglas, Fond du Lac, Vilas and Washburn Counties.

Yellow-breasted Chat.—A number of people observed up to 2 birds in Green Co. between June 10 (Hoffman) and July 17 (Burcar). Also noted in Grant Co. July 8 (Bradley) and Green Lake Co. June 11 (2 birds) through July 4 (Schultz).

Northern Cardinal.—Among the 48 counties in which this species was observed, Ashland/Bayfield, Forest and Vilas were the most northern.

Dickcissel.—Observers found these in 31 counties, compared to 24 the past 2 years and 43 in 1988, which was the first "big" year in a long time. Hudick reported "pretty good" numbers in Polk Co., and birds reached as far north as Marathon, Oconto and Washburn Counties.

Field Sparrow.—The northernmost reports came from Douglas (Johnson) and Vilas (Reardon) Counties. Observed in 38 counties overall.

Lark Sparrow.—Noted in Walworth (Parsons, 6 birds) and Sauk (Domagalski, the Leglers, Tessen) Counties.

Lark Bunting.—An adult male observed June 26 in the Mead Wildlife Area, Marathon Co., provided Wisconsin's fourth summer record (Breihan). Accepted by the Records Committee. See "By the Wayside."

Henslow's Sparrow.—Noted in Calumet, Green Lake, Lafayette, Marathon, Portage, Richland, Taylor and Waukesha Counties.

LeConte's Sparrow.—Reported from more counties than usual, at least in recent years: Ashland, Bayfield, Burnett, Douglas, Jackson, Marathon, Oneida, Taylor, Washburn and Vilas.

Sharp-tailed Sparrow.—Two birds were heard in different locations at Crex Meadows, Burnett Co. on July 7 (Soulen).

Lincoln's Sparrow.—Reported from these counties: Douglas, Forest, Oneida, Washburn and Vilas (where Spahn counted over 40 birds July 7).

White-throated Sparrow.—Rudy found 6 in Fond du Lac Co. June 5. Also reported from 13 considerably more northern counties.

Dark-eyed Junco.—Noted in these counties: Ashland/Bayfield, Douglas, Menominee, Oneida and Vilas (where Spahn counted 18 on July 4).

Yellow-headed Blackbird.—Ziebell counted 480 in Winnebago Co. June 16. Reported from 21 counties overall.

Orchard Oriole.—Observers reported this species from no less than 15 counties this year: Calumet, Dane, Eau Claire, Grant, Green, Iowa, Monroe, Ozaukee, Polk, Richland, Sauk, Shawano, Trempealeau, Vernon and Walworth.

Purple Finch.—Birds in Eau Claire Co. July 6 (Bradley) and Jackson Co. June 22 (Robbins) were further south than others reported this year (except for a few Lake Michigan locations, where some summer each year). Noted in 21 counties overall.

House Finch.—The northward spread continues, with new summer observations this year from Ashland/Bayfield, Langlade and Forest Counties. The season's total of 29 counties compares to 21 last year. Five years has seen quite a change; 1986 provided the state's first summer records, from 4 counties.

Red Crossbill.—Except for 66 birds in Jackson Co. June 10 (Berner), numbers reported were small. Recorded also in Douglas, Eau Claire, Langlade, Menominee, Sawyer, Sheboygan and Taylor Counties.

White-winged Crossbill.—Noted only in Forest Co. July 27 (Soulen).

Pine Siskin.—Relatively few were observed this season. Except for 2 birds in Winnebago Co. until June 25 (Ziebell), reports came only from these northern counties: Ashland, Bayfield, Burnett, Douglas, Forest, Oneida, Price and Vilas.

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"By the Wayside"

Observations of Mallard, American Kestrel, Common Black-headed Gull, Iceland Gull, Great Gray Owl, Chuck-will's-Widow, Yellow-throated Warbler, Wilson's Warbler, Lark Bunting, and American Goldfinch are featured.

ADULT MALLARD KILLED BY SNAPPING TURTLE

May 12, 1991, Sawyer Co., Teal River Flowage—Although snapping turtles are commonly regarded as important predators on juvenile ducks and other water birds, it is surely rare for an adult duck to be killed by a turtle. While birding by canoe on the Teal River Flowage we saw in the distance what seemed to be a duck furiously beating its wings against the water. As we approached closer it turned out to be an adult drake mallard (*Anas platyrhynchos*) whose head was being held under water. By the time we were within reach of the bird it was dead—apparently drowned, and was found to have what appeared to be bite-marks on the neck. The water was only 8–12 inches deep at this point in the flowage and we believe the duck had dabbled near a snapping turtle which had seized its neck and held on until we approached in the canoe.—*Richard & Anita Wilson, 1319 Oakwood Avenue, Menomonie, WI 54751.*

OBSERVATIONS OF AMERICAN KESTRELS EATING PEA PODS

July 1991, Fond du Lac and Calumet Counties—Just after noon on July 3, 1991, I was driving north from Fond du Lac on Town Hall Road. As I neared the Calumet County Line, I passed a field where a green pea combine was at work harvesting the crop of peas. On a utility wire between the road and the pea field, I spotted an American Kestrel eating something. Because of my special interest in Kestrels, I often check to see what kind of prey they have captured, so I slowed down to get a better look—not stopping because the Kestrel usually flies away if I stop. I was very surprised to see a pea vine dangling from its talons and that the bird appeared to be eating a pea pod. There was of course the possibility the bird had snatched up the vine along with an insect that I could not see.

When I got home, I checked the stomach content analysis in *Life Histories of North American Birds of Prey* by A. C. Bent for mention of Kestrels having consumed any vegetable matter at all—there was none. Luckily I had ac-

cess to a Kestrel I could test for any inclination to eat peas. Our local Nature Center's captive Kestrel, which was brought in as an injured young adult five years ago, has always been fed a fairly normal Kestrel diet of mice, grasshoppers, crickets, roadkill birds and assorted rodents, supplemented occasionally with chicken. She has always disdained anything other than fresh meat even when very hungry.

I picked some fresh, well-filled pea pods from my garden and offered one to her. She snatched it with one talon and began to devour it much as she would a grasshopper. To my surprise, she ate the pod and discarded some of the peas. I offered her another pod and she ate that one too. Later on when I offered her both a pea pod and a fresh rodent together, she chose the pea pod. The next day I offered her an edible-podded pea which she liked even better since it had a greater amount of fleshy pod which is the part she prefers. She continued to eat one or two pea pods daily until the fresh pea season ended, sometimes consuming the peas too, sometimes not.—*Carroll Rudy, W3866 Highway H, Chilton, WI 53014.*

COMMON BLACK-HEADED GULL (*Larus ridibundus*)

11 and 13 June 1991, Manitowoc County—I met John Nielsen as he was leaving the Manitowoc containment area and he reported that he had just found a Black-headed Gull in the Containment. The bird was found standing with a large number of Bonaparte's Gulls. Because of its larger size, about two inches larger compared with the Bonaparte's Gull, and the brown facial "mask", it was quickly distinguished

from the other "black-headed" gulls. The bird gave the general appearance of a large Bonaparte's Gull, except for the brown "facial" mask. The ocular crescents were present and broken making it quite similar to the Bonaparte's Gull. The bill was larger than the Bonaparte's Gull and very obviously red in colour. The feet were also red (reddish orange). While standing on the containment shore-line, the mantle appeared to be about the same colour as the Bonaparte's Gull. The bird was not flushed in hopes of keeping the bird in the area. Two days later, the bird was discovered flying along the Lake Michigan shore-line about two miles south of the containment vessel. The bird dove several times, capturing what appeared to be small alewives. It was at this time that the characteristic wing pattern became evident where both the dorsal and ventral side of the wing were seen. The dorsal side appeared to be quite similar to the Bonaparte's Gull as the light gray was only interrupted with the white on the leading edge of the wing creating the white triangle. The underside of the primaries, however, were dark. The tail was white and unmarked. During the two observational periods, both standing and flying, the bird did not vocalize. As with previous observations on Black-headed Gulls found in the area, it would aggressively posture the Bonaparte's Gulls, keeping them from its larger "personal space."—*Charles Sontag, 804 N. 4th Street, Manitowoc, WI 54220.*

ICELAND GULL (*Larus glaucooides*)

June 1991, Manitowoc County—A subadult bird in transition plumage was observed on several occasions during

the month of June. It was first found on the Lake Michigan shore at Silver Creek Park while eating a dead salmon. The general appearance was a mottled tawny bird with some gray appearing on the mantle. The size was smaller than the nearby Herring Gulls by about one to two inches. The bill was smaller in proportion and black through most of its length, becoming lighter at the base. The iris was dark and the feet were pink. In flight, the primaries were light both above and below blending into the secondaries. The tail was also mottled, but giving the appearance of being barred. The head appeared smaller and rounder without the "chisel-shape" appearance of the Herring Gull. During the periods of observation, it was usually seen with the Herring Gulls. As a result, the comparisons in shape and plumage were easily made.—*Charles Sontag, 804 N. 4th Street, Manitowoc, WI 54220.*

GREAT GRAY OWL (*Strix nebulosa*)

June and July 1991, Douglas County—As years progress, increased knowledge of Great Gray Owl preferred habitat has furnished rewarding benefits to the understanding of the status of these birds in Wisconsin. The summer of 1991 proved to be another valuable season as two great grays were observed by myself and other natural resource agency personnel over a period of basically a month.

On 19 June, Mike Cramey (D.N.R.-Pattison Park) informed me he had just observed a great gray owl in a lowland area of western Douglas County. The following day, I was fortunate enough to also observe this individual. It was one-third larger in overall proportions than a Barred Owl but the head was

much larger in respect to the remainder of the body. Other obvious identification points seen were yellow eyes, white 'bow-tie', concentric rings radiating laterally from the eyes, and the dark-gray coloration. The habitat in this area is a mosaic of muskeg bogs, sedge/carr basins, and divisions of upland spruce/fir. Breeding is suspected but no young could be found.

The second individual was relayed to me by David Epperly and Mark Radzak (Douglas County Forest administrators). On 12 July, while conducting field work in a very remote section of Douglas County, I met up with Dave and Mark, and they excitedly told me they had just seen a Great Gray not 5 minutes before, just down the road. When I got there, however, I failed to find it. Later, however, on 16 July, I did see what may have been the same bird about 1/2 mile further west than that which they had reported. Again breeding is likely but no clues were discovered. Both birds were observed at dusk, the primary great gray feeding time period.—*Larry Semo, Rt. 2, Box 435, Superior, WI 54880.*

CHUCK-WILL'S-WIDOW (*Caprimulgus carolinensis*)

13 July 1991, Oconto County—On July 13, 1991 near the town of Hintz in Oconto Co. Bob Domagalski and I arrived about 8:20 P.M. at the spot where this bird had previously been heard singing. We listened to the bird calls as the sun set noting the Wood Thrush, Veery, Song Sparrow, and Whip-poor-will. About 8:45 P.M. we began hearing the Will's Widow call faintly at first, then somewhat closer. As we listened for several minutes it grew louder and appeared to be com-

ing from a mixed deciduous/pine woods about 100 yards away. After several minutes of the Will's Widow call, the Whip-poor-will called from a woods about 200 yards away. It appeared as if the two individuals were calling in competition. As we carefully continued to listen, we now could distinguish the first syllable 'click' or Chuck of the Chuck-Will's-Widow call. We continued to listen to both calls comparing the difference between the Whip-poor-will and Chuck-Will's-Widow for approximately forty-five minutes. Although we never saw either individual, we heard the three note Whip-poor-will call and the four note Chuck-Will's-Widow call from a distance of 100 to 200 yards. The weather was clear with the local traffic noise very minimal.—*Kay Burcar, 5136 Enchanted Valley Road, Cross Plains, WI 53528.*

13 July 1991, Oconto County—Go to the location where Chuck-will's-widow has been heard since early June. Arrive about 8:30 p.m. and stand outside car listening for calling of the bird. At 8:50 p.m. hear several quick "Will's Widow" calls from wood to the north. For the next seven minutes hear only the "Will's Widow" call before the Whip-poor-wills begin calling at 8:57 p.m. Several times the Chuck-will's-widow calls from close to the car and at such times I am clearly able to hear a short sharp "Chuck" sound before the more audible "Will's Widow." Listen until 9:20 p.m. before leaving. The Chuck-will's-widow calling nearly all the time since 8:50.—*Robert C. Domagalski, W140 N8508 Lilly Road, Menomonee Falls, WI 53051.*

9 June 1991, Oconto County—Arrived at the spot shortly before 4:00 a.m.

Only Whip-poor-wills were singing. Noel Cutright and Bettie Harriman arrived about 5 minutes later. For 5 minutes only "Whips" were heard. Then around 4:00 a.m. the Chuck-will's-widow commenced calling to the northeast of us. At first its call was faint, but increased in loudness for a period of time. The call consisted of two notes, the first note could not be heard, only the last two. Will's-widow—will's-widow.—*Daryl D. Tessen, 2 Pioneer Park Place, Elgin, IL 60123.*

YELLOW-THROATED WARBLER (*Dendroica dominica*)

21 June 1991, Sheboygan County, Kohler-Andrae State Park—This small, warbler-sized bird had a *bright* yellow throat and upper breast. The remainder of the breast, the belly, and the undertail coverts were white. The crown, back, wings, and tail were gray. There were two white wingbars. There was a white line above the eye, which went back to a white patch on the side of the head. There was a triangular black patch below the eye and on the cheek, which ran down into black streaking on the sides of the breast and belly. I also noticed that it had a rather long bill for a warbler. The bird continued to sing throughout the sighting—sweet descending notes, with the final note rising, which I recognized as the song I had been listening to on tape.—*David Brasser, 813 Logan Avenue, Sheboygan, WI 53083.*

22 June 1991, Sheboygan County, Kohler-Andrae State Park—While watching and listening to a Pine Warbler in the evergreens, I noticed another warbler-like bird moving slowly in an ash tree just to the west. Looking

at this second bird, I immediately saw a bright yellow throat with a black patch by the eye and into the ear area. Above the eye was a white line extending from the bill to the back of the head where it touched a large white patch on the side of the head. The belly was white with heavy dark streaking along the edges below the wings. Wings had two white bars. Top of head and the back were a solid slate color. The bird did not sing but was feeding actively in a tall ash tree and in a patch of short pines.—*Robert C. Domagalski, W140 N8508 Lilly Road, Menomonee Falls, WI 53051.*

2 July 1991, Sheboygan County, Kohler-Andrae State Park—On 7-2-91 in Terry Andrae-Kohler State Park near the Sanderling Nature Center I listened for the voice of the Yellow-throated Warbler. About 100 yards from the intersection of the nature center turnoff at approximately 12:30 P.M. I heard the distinct call of what I believed to be the Yellow-throated Warbler. I then observed a warbler-sized bird in a pine tree approximately thirty feet tall feeding along the branches. With the sun at my back I first noted the bright black and white striping immediately below the wing along the side of the bird. At this time I also noted two white wing bars. As the bird continued to feed and sing I observed the individual for about three minutes as it fed near the top of the tree. It then crossed the road into another pine tree where I observed the slate-gray back and black cheek patch of its head. I remained in the area for about thirty minutes listening to its continual song. Since many other birds were no longer singing as it was during the middle of the day, this song rang

out loud and clear. I noted that this was the only bird feeding in this portion of the wooded road.—*Kay Burcar, 5136 Enchanted Valley Road, Cross Plains, WI 53528.*

5 July 1991, Grant County, Wyalusing State Park—Did not see the Yellow-throated Warbler [and perhaps should thus not make this report?]. I had last seen and heard the Yellow-throated Warbler at Kohler-Andrae State Park, Sheboygan Co., on Sunday June 30th and was familiar with its song. From the pines at Wyalusing came the same series of clear and down slurred whistles that always ended with a rising note. Spent about 10 minutes trying to see the bird but without success.—*Robert C. Domagalski, W140 N8508 Lilly Road, Menomonee Falls, WI 53051.*

18 July 1991, Grant County, Wyalusing State Park—On July 18, 1991 about 1:00 P.M. I drove to a section of pine woods at Wyalusing State Park located at the intersection where the road either continues up to the ridge or follows down to the boat landing. On two previous trips this year to this area I had heard what I believed to be the song of the Yellow-throated Warbler. The singing seemed to be only a short way from the road on 7-18, so I walked into the woods about seventy yards when I noticed movement in a deciduous tree between several pine trees. Since the leaves on this tree were compound, many open spaces allowed me to view the bird quite well. First I observed the warbler size and flighty movement of the bird. The bright yellow throat patch gleamed in the brilliant sunshine. It contrasted with the white of the belly. Two bold white wing bars were noted. The black and white

striping along the side breast was very visible. I continued to observe the bird as it fed and sang for several minutes. I saw the dark head with white eyebrow which continued to the nape. The black cheek patch bordered the bright yellow throat patch. Again and again I observed the yellow throat patch bordered by the black and white striping along the side. The back and tail appeared as a solid dark coloring. I observed that the bill was long and thin. The bird gave its call approximately twenty times as I was observing. Since it was mid-day there were very few other birds present with the exception of several Chipping Sparrows and a Black-capped Chickadee. The Yellow-throated Warbler fed without interruption from other birds around.—*Kay Burcar, 5136 Enchanted Valley Road, Cross Plains, WI 53528.*

WILSON'S WARBLER (*Wilsonia pusilla*)

4 and 6 July, 1991, Oneida County, Thunder Lake Marsh—A surprise in our first visit to Thunder Lake Marsh in the alder thicket along the road to the main lake. We were spishing for Yellow Warbler etc., when I noted a yellow warbler with a black skull cap well off the road, 40–50 ft back. It eventually spished in to within 10 ft in a bush near the car. None of the warblers were singing that evening (7/4). There may have also been a female there, as the first "yellow" warbler which popped out briefly really looked "odd," but I didn't really focus on it and wrote it off as a strangely marked immature, not even thinking about Wilson's until after seeing the male. The female? did not show again. I returned briefly on the 6th and heard the

male singing a bit farther back in the brush at the same spot, but could not bring it in with spishing in the time I had (on the way to daughter's horse-back riding appointment) and saw no other interesting individuals.—*Robert Spahn, 716 High Tower Way, Webster, NY 14580.*

LARK BUNTING (*Calamospiza melanocorys*)

26 June 1991, Marathon County, Mead Wildlife Refuge—I did a three-day birding trip in late June to several of the north central Wisconsin wildlife refuges. I started birding the North Honey Island Flowage in the Mead Wildlife Area before 6:00 A.M. on 26 June. At 7:35 A.M. I was hiking along a dike through knee-to-waist-high prairie grass when a black bird with white-blotched wings flew up in front of me.

This was on the north side of the flowage about 1.25 miles north and west of the pump house. (See map on p. 181 of the 1989 edition of *Wisconsin's Favorite Bird Haunts*.) Alongside the dike to the north is a heavily wooded drainage canal, mostly mature willow, elm, green ash and silver maple. These trees partially shaded the dike. With no sun glare visibility was excellent.

The bird landed about thirty feet away on an exposed branch of a scrub willow three feet off the ground. My first thought as it flew by was Red-headed Woodpecker. But the flight pattern was all wrong and the bird just looked too small. As it landed on the branch I could see it was clearly not a Red-headed Woodpecker: no red head. Nor was it a female Downy or Hairy Woodpecker. Its head was all black. In fact, except for the large

white wing spots its entire body was black. I could not see the underside of its tail as it perched. I did not think to look for white in that area later when it flew off.

As I was ruling out woodpecker, red-headed or otherwise, Bobolink popped into my mind. But it couldn't be a Bobolink. There was no white patch on the back of the head. Its beak (and head shape) was finch-like, not like that of a Blackbird. It had the wrong silhouette or body shape. And, furthermore, it just didn't act or move like a Bobolink. (I'd seen a number the previous day so the comparison was fresh in my mind.)

The mysterious black bird sat on the branch for less than a minute. This was long enough for me to study it carefully through binoculars (8×40). When it flew into the tall grass, I ran over to see where it had gone. After a few minutes of searching I flushed it out. It flew up in front of me and off into the woods. I had gotten another good look at it.

I thought to myself, no such bird exists, at least none found in Wisconsin. But when I took out my Peterson field guide and turned to the sparrows and finches section, there it was, a male Lark Bunting.

As soon as I realized I was dealing with a Wisconsin rare bird, I started to search the area. Maybe there were others, maybe females, maybe signs of nesting. Nothing. I listened awhile for a call or song like that described in the field guides. (I had only that to go on since I'd never heard a Lark Bunting.) I listened the rest of the morning as I

completed my five hour hike. I heard nothing that sounded like a Lark Bunting. I'm told the bird I saw was probably an isolated visitor far from its summer breeding range.—*Bill Breihan, 3062 N. Cambridge Ave., Milwaukee, WI 53211.*

ABNORMAL COLORATION IN AN AMERICAN GOLDFINCH

*16 May 1991, Manitowoc County—*On the morning of May 16, 1991, Bernie Brouchoud and I were doing a Big Day Count at Woodland Dunes. As we parked beside the railroad tracks to bird the portion of the Nature Preserve that borders the tracks, we saw a very unusual-looking bird feeding on the ground about 20 feet in front of us. It was all yellow and white, at first glance appearing much like a pale domestic canary; but after we observed it feeding for a few minutes we could see that it was a male American Goldfinch. The yellow portions of the body were perfectly normal, but the parts that would normally be black—the wings, tail and cap—were white. It was feeding on dandelion seeds with other goldfinches and after we watched it for a few minutes it flew up in the trees with them. The bird's behavior, call notes, flight, bill, eye and leg color were all the same as its normally colored companions. This appeared to be a case of partial albinism in which only the dark melanin pigment was missing as described in Joel Carl Welty's *The Life of Birds*, third edition, page 56.—*Carroll Rudy, W3866 Highway H, Chilton, WI 53014.*



Snowy Plover (Two Rivers, WI, 23 April 1991) *photo by Janine Polk.*

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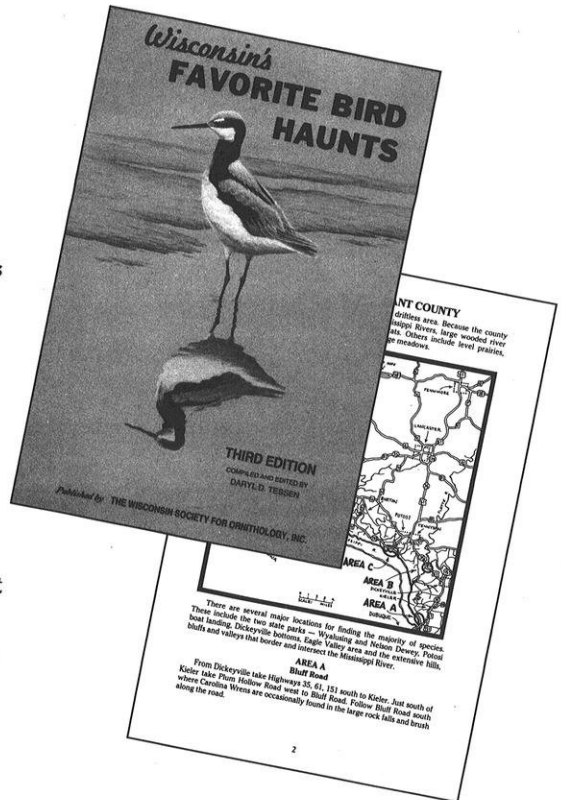
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