The passenger pigeon. Vol. 53, No. 1 Spring 1991

Madison, Wis.: Wisconsin Society for Ornithology, Spring 1991

THE PASSENGER PIGEON
Vol. 53 No. 1
Spring 1991

JOURNAL OF THE WISCONSIN SOCIETY FOR ORNITHOLOGY

THE PASSENGER PIGEON Vol. 53 No. 1 Spring 1991

The Passenger Pigeon (ISSN 0031-2703) is published quarterly (Spring, Summer, Fall, and Winter) by The Wisconsin Society for Ornithology, W330 N8275 West Shore Drive, Hartland, WI 53029. Subscription rates are: Individual, $12 per year; Family, $15 per year; Sustaining, $25 per year; Library, $18 per year; Life, $200; and Patron, $750. Back issues may be obtained from the Supply Department for $5.00 each. Send change of address requests to Memberships, W330 N8275 West Shore Drive, Hartland, WI 53029.

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

HONEY CREEK MASTER PLAN

In my president's statement in *The Passenger Pigeon*, Vol. 51, No. 3, I presented a case for the responsible management of our lands. This statement was primarily an introduction to a management plan that had been developed. However, there was one important part to the statement that still needs to be addressed. We still do not have a vision or goals for our Honey Creek Property.

WSO has had a vested interest in Honey Creek for over thirty years. During that period of time, the property has expanded to its present size. Hundreds of people have used our nature center, and many more have birded the property. The property's intrinsic values, those of providing needed habitat for plants and animals, have not been fully assessed, but it is known that Honey Creek harbors many rare species.

Nearly thirty years have elapsed since the original purchase was made. At that time, I'm sure that there was ample justification to buy the property. In addition—and probably more important for this discussion—there was most likely a clear vision of what the property's purpose was. Unfortunately for us, thirty years later, there was never a written plan to guide WSO decision makers.

At the October, 1990, WSO board meeting, it was resolved to form a committee, consisting of WSO board members and general WSO members. The committee will include several members who have expressed strong interest in Honey Creek, and through *The Badger Birder*, we will solicit other members wishing to participate. It was also resolved that the president assemble this committee and give them a basic format from which to proceed. A December 31, 1991, deadline was given for a committee report to be given the president. Upon receipt of the master plan, the general membership would have a chance to request a copy and make comments. Thereafter, a final Honey Creek Master Plan, would be submitted for approval at the 1992 annual convention.

At this time the committee will be chaired by Noel Cutright. The other committee members are Sam Robbins, Carlo Balistrieri, Gordon Cox, Ed or Jeannette Peartree, Barb or Lee Kranich, Judy Haseleu, Harold Kruse, Dick Appleyard, and Steve Richter. The committee' composition is that of long-time members who have had strong Honey Creek ties, long-time members without strong Honey Creek ties, and some new members that just have a strong conservation ethic. The committee may include another person or two by the time it's finalized. If anyone in the general membership has any strong feelings or pertinent suggestions, please let someone on the committee know.

This committee will be charged with developing a vision or purpose for Honey Creek. This purpose must complement WSO's purpose which is stated in the Articles of Incorporation, Article II, Section I. The purpose of the society shall be to stimulate interest in and promote the study of birds in Wisconsin toward a better understanding of their biology and the basis of their preservation.

This purpose will be accomplished by goals for our Honey Creek property. The committee will look at the property's natural and cultural history, current flora and fauna, current land use (both on our land and adjacent lands), water resources, archeological resources, and current facilities. From these various inventories, they will develop goals including recommendations for future activities and actions.

From this committee, with membership review and adoption, we should finally have a document to guide WSO decisions.

Randy Hoffman

President

50 Years Ago in *The Passenger Pigeon*

Howard Young, Bruce Stollberg and Murl Deusing teamed to publish "The Spread of the Cardinal Through Wisconsin." They document the presence of Northern Cardinals in 57 Wisconsin counties and nesting records for 25 counties. "Prior to the year 1900 the Northern Cardinal was a rare straggler in Wisconsin. Since 1900 they moved into Wisconsin in a series of definitive invasions or spreads." Invasions occurred in 1900, 1910–12, 1919–20, 1927–28, and 1932–35. They noted a rather high correlation between the spread of the Northern Cardinal and the droughts of Wisconsin. Drought years generally preceded the invasions of these birds by a year or two.

The January issue also detailed the results of the Christmas Bird Counts for 1940. Sixteen counts were made, with a high count of 51 species reported from Madison.

The March issue noted that 18 Willow Ptarmigan trapped 300 miles north of Winnipeg were released on January 31, 1941, in Wood County as a stocking experiment by the Conservation Department. Advertised rates for rooms in Racine for the third annual WSO meeting were $1.50 at the Hotel Racine, $1.25 at the Hotel Nelson, and $1.00 for the YMCA (excerpted from Vol. 3, Nos. 1 and 3.

The 1990 Wisconsin Christmas Bird Counts

The 1990 Christmas Bird Counts in Wisconsin were rather average, with 132 species being recorded. Both observers and party-hours were down, and deep snows kept numbers down.

by William L. Hilsenhoff

The 1990 Christmas Bird Counts can be characterized as average, at best. Weather during the count period was generally poor, with cloudy, snowy, windy weather on December 15, when one-third of the counts were made, and cold or windy weather on many other days. Deep snow that fell in much of southern Wisconsin in early December hampered travel by foot and probably forced most individuals of half-hearty species to fly south. Also, unlike last year, the flight of winter finches into Wisconsin was exceptionally poor. The only bright spot was the mild weather prior to the count period that allowed many lakes and most streams to remain open during the first week of the count period, providing excellent counts of waterfowl and gulls. Severe cold at the beginning of the second weekend of the count period finally froze most lakes and rivers. There were 80 fewer observers and 128 less party hours than on last year's count, which may be a reflection of the adverse weather.

The 132 species recorded this year was near the average for the last ten years. Several rarities highlighted the counts. Trumpeter Swans were observed for the first time (6 at Grantsburg), but since these were captive-reared birds that were released into the wild, their inclusion in the count has been questioned. However, since these birds and other captive-reared birds (Peregrine Falcons, for example) are wild, it soon will be impossible to distinguish them from others of their species except by looking at their bands. Seen for only the third time on Wisconsin Christmas Counts were 2 Barrow's Goldeneyes at Newburg, a Sandhill Crane at Green Lake, and a Pine Warbler at LaCrosse. Found for the fourth time was a Hawk Owl at Brule. A Peregrine Falcon at Madison (not a recently released young bird) and a Thayer's Gull at Bayfield represent the fifth time these species have been sighted. Found for only the sixth time on Wisconsin Christmas Counts were a Northern Oriole at Peshtigo, a Black Scoter at Madison, and a Surf Scoter at Milwaukee. Making their sev-

enth appearance were Double-crested Cormorants and Harlequin Ducks, with a record 17 Double-crested Cormorants reported on 4 counts and 6 Harlequin Ducks seen on 3 counts. Several other Christmas Count rarities were not included because your Associate Editor and I concurred that the documentation was not convincing. These included reports of a Green Heron, 2 Broad-winged Hawks, a Swainson's Hawk, an American Woodcock, 2 Ruby-crowned Kinglets, and a flock of 12 Field Sparrows. A Merlin that was reported at Appleton was not included because documentation was not provided. A Chukar at Kenosha also was not counted because the wild status of this species in that area has not been established.

Fifteen counts found 50 or more species, one more than last year, but this year fewer counts had 30 or more species. Five counts reported more than 60 species, Poynette and Sauk City (61), Newburg and Milwaukee (62), and Madison (84). The success of the Madison and Sauk City counts can be at least partially attributed to a 1-day postponement of each count to a day with better weather. All counts should consider having a contingency plan to avoid bad weather.

Location and Details of the Counts

Information on weather and participation in each count is summarized in Table 1. Seventy-nine counts were compiled this year, one more than last year. Welcomed were new counts at Burlington and Clam Lake and returning counts at Clyde, New Richmond, and Pensaukee. Counts at Arcadia and Arpin were not repeated this year, and the count at Fort Atkinson was not compiled because it included only 5 hours of observation. Report forms for counts at Horicon Marsh (32 species) and Kettle Moraine (33 species) also were not compiled because they were received after the other counts had been compiled and tables had been typed. The Horicon Marsh count reported 55,000 Canada Geese, a Yellow-headed Blackbird, and 9 Brewer's Blackbirds. Locations of the counts are shown in Figure 1. The counts are numbered generally 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 (50); 1.25 miles S of Dellwood on Hwy. Z; Ted May, Rt. 1, Whitehall, WI, 54773; (715) 538–4370. **Amery** (16); Jct. Soo Line RR and Hwy. D; Bernie Klugow, Box 13, Brule, WI 54820; (715) 372–4858. **Amherst** (28); Jct. Hwys. A and B; David Borchardt, 10296 Yellowbrick Rd., Amherst, WI 54406; (715) 824–3971. **Appleton** (36); Jct. Hwys. 10 and 45; John Shillinglaw, 1952 Palisades Dr., Appleton, WI 54915; (414) 731–3237. **Ashland** (2); Jct. Hwys. 2 and 118; Dick Verch, Biology Department, Northland College, Ashland, WI 54806; (715) 682–1335. **Baraboo** (57); Jct. City View Rd. and Hwy. A; Raymond Dischler, 3830 Anchor Dr., Madison, WI 53714; (608) 249–4581. **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, Rt. 2, Box 294, Evansville, WI 53536; (608) 876–6242. **Black River Falls** (48); Jct.

Table 1. Details of the Counts.

Name of Count	Date	Sky	Snow (in)	Wind Dir.	Wind Vel.	High Temp. (°F)	Low Temp. (°F)	Observers at Feeders	Observers in the Field	Parties	Party Hours	Owl Hours
Adams	12/15	Cloudy	9	E	0–10	32	30	4	3	2	18	0
Amery	12/23	Cloudy	6	W		8	−21	7	6	4	24	4
Amherst	12/15	Snow		W	0–3	27	22	2	7	4	18	2
Appleton	12/15	Cloudy	10		calm	32	28	0	24	16	70	0
Ashland	12/15	Cloudy	1		calm	32	30	0	9	4	32	2.5
Baraboo	12/26	Fair-Cloudy	6	NW	8	2	−20	2	8	3	25	1
Bayfield	12/18	Cloudy	1	NW	0–5	25	20	1	9	5	35	2
Beloit	12/15	Cloudy	2	S	5	31	30	0	20	12	49	0
Black River Falls	12/29	Cloudy-PCl	10	NW	10–25	18	0	16	4	2	14	1
Blanchardville	12/27	Fair	4	SW	5–10	20	8	0	2	1	9.5	0.75
Bowler	12/23	Fair	13			22	−4	9	2	2	8.5	0
Bridgeport	12/19	Cloudy-Fog	10	S	2–15	34	28	0	13	7	45.75	6.25
Brule	1/2	Cloudy-MCl	8	SW	8–12	16	−21	7	8	6	30	6
Burlington	12/30	Snow	4	NNW	15–25	12	−2	0	4	2	17.5	2
Caroline	12/29	Cloudy-PCl	12	NW	5–15	30	20	11	4	2	12	1
Chippewa Falls	12/23	Fair	6	SE	0–3	−13	−19	0	3	2	9.5	0
Clam Lake	12/30	Fair	6	NW	5	3	−14	0	5	2	18	0.5
Clyde	12/31	Fair	8	NW-W	3–10	12	−5	0	6	3	18.3	1
Columbus	12/16	Cloudy	12	W	0–5	33	32	2	4	3	19	1
Cooksville	12/30	Cloudy-PCl	4	NW	15–25	6	0	2	4	2	18	2
Durand	12/15	Cloudy	7	NE	0–2	31	19	0	8	4	28.5	0
Ephraim	12/15	Fair-Snow	7	NE	10–20	32	20	19	28	14	66	0
Fifield	12/29	Cloudy	6	NW-E	5–20	20	−5	24	9	4	23	0
Fond du Lac	12/15	Snow-Cloudy	7	NE	5–15	32	28	1	12	4	25.5	0
Fremont	12/29	PCl-MCl	7	WNW	5–20	32	18	0	3	2	13	0.5
Gilman	12/29	Snow	8	NW	5–15	26	4	5	10	4	33.25	1.25
Grantsburg	12/15	Cloudy-Fair	9	NW	9–14	33	24	1	15	7	34	2
Green Bay	12/15	Snow	5	ENE	5–8	34	30	10	32	16	76	10
Green Lake	12/29	Snow-MCl	3	W-NW	5–15	32	15	1	10	4	20.5	0.5
Hales Corners	12/16	Fair-Cloudy	1	SW	5			0	14	7	24.25	3
Hartford	12/27	Fair	tr.	SE	0–20	25	8	8	19	6	33.75	5
Holcombe	12/19	Fair-Cloudy	5	W	0–2	29	12	0	9	4	30	0
Hudson	1/1	Partly Cloudy	5	S-NW	14–20	25	14	0	5	2	13	0.5
Kenosha	12/22	Cloudy-Fair	0	WNW	8–20	17	8	0	2	1	9	0
Kickapoo Valley	12/23	Fair	16	W	3–5	−4	−18	0	7	4	28.5	1
LaCrosse	12/15	Snow-Cloudy	18	NW	0–3	32	29	1	30	18	101.75	0.5
Lake Geneva	12/16	Fair-Cloudy	0	SW	0–2	30	26	0	4	2	21	0
Lakewood	12/31	Fair-Cloudy	12	W	5–15	8	−15	0	1	1	8.75	0
Luck	12/15	Partly Cloudy	3	NE	10–20	35	24	17	8	4	21	4
Madison	12/16	Fog-Cloudy	10	S	3–15	30	21	10	61	27	180.25	27.25
Medford	1/1	Fair	11	SW-NW	2–8	22	10	6	13	6	46.75	2.75
Merrill	12/21	Cloudy	8	NW	3–10	20	10	2	9	5	33.5	2
Milwaukee	12/15	Rain	tr.	W	6	41	37	9	22	10	67.5	2
Mount Horeb	12/16	Cloudy	6	SW	0–8	28	19	24	34	20	55.5	1.5
Nelson	12/31	Fair		SE	5–10	8	−12	0	8	4	34.75	0
Newburg	12/15	Cloudy	1	E-NW	0–10	37	32	21	69	30	210.5	21
New Richmond	12/15	Snow-Cloudy	7	NE	5–10	33	33	1	6	3	22.25	1
Oconomowoc	12/23	MCl-PCl	2	NW	15–25	2	−8	6	20	6	38	1
Oshkosh	12/15	Snow-Cloudy	9	E-N	10–12	33	32	1	18	9	65	0
Owen	12/15	Snow-Cloudy	5	SE-NE	8–16	28	26	12	13	7	53.5	7.25
Oxbo	12/15	Snow-Fair	3	ESE	0–2	32	28	8	10	6	27	1
Pensaukee	1/1	PCl-MCl	6	W-SW	5–12	23	8	1	2	1	8	0.5
Peshtigo	12/15	Cloudy	3	NE	5	34	27	0	4	2	16	0
Phelps	12/15	Snow-Cloudy	3	NE	5	30	26	3	7	4	25	1
Platteville	12/30	Snow-Fair	12	NW	5–20	5	−5	8	10	5	21	1
Plymouth	12/15	Fog-Cloudy	6	E	0–10	38	31	2	10	5	20.75	0
Poynette	12/30	Cloudy-PCl	10	NW	5–15	6	2	15	26	11	79	1.5
Racine	12/15	Rain	2	SE-SW	10–20	34	26	3	18	9	65	1
Randolph	12/21	Cloudy		S	0–5	31	10	0	2	1	9	0
Rhinelander		Fair	6					11	2	2	10	0
Richland Center	12/16	Cloudy	11	var.	0–5	35	23	1	37	17	90	2
Sauk City	12/23	Fair	6	NW	5	0	−20	1	26	11	70.1	5.25
Shawano	12/15	Cloudy	5	NE	5–20	33	28	13	5	5	22	2
Shiocton	12/21	Cloudy	9	W	0–10	35	32	4	9	4	24.25	0
Solon Springs	12/20	Snow-Cloudy	6	SE-NE	12–20	30	8	10	3	2	18	2
Spencer	12/16	Cloudy	10	S	0–5	30	20	7	19	6	51.5	3.5
Stevens Point	12/29		15	NE-NW	5–18	24	10	9	15	8	33.75	0
Stockbridge	12/15	Cloudy	6	E-NE	10–20	38	25	4	7	6	24.5	0
Sturgeon Bay	12/31	Fair-PCl	3	NW	10–15	10	−4	9	5	5	25	0
Three Lakes	12/29	Snow-Cloudy	6	NW	5	20	5	1	7	5	21	0
Trempealeau	12/29	Snow-PCl	18	NNW	5–15	20	5	1	17	7	49	0
Waukesha	12/15	Cloudy	2	SE	0–15	38	32	4	19	8	47	9
Wausau	12/29	Snow		N-NW	10–25	23	15	3	4	3	9	0
Wautoma	12/31	Fair	10	SW	15	7	−17	40	8	5	19	1
Willard	12/22	Fair-PCl	16	NW-W	5–15	−10	−16	2	10	5	38	2.25
Woodland Dunes NW	12/29	Cloudy-PCl	12	SE	2–6	22	18	1	3	2	16.5	0
Woodland Dunes NE	12/30	Snow-Cloudy	12	N	6–15	20	8	6	12	7	30.5	2
Woodland Dunes SW	12/15	Rain-Snow	4	NE	5–15	39	24	0	4	3	17.25	0.5
Woodland Dunes SE	12/22	Fair-Cloudy	8	NW	8–15	20	4	4	9	8	37.75	0
TOTALS								413	954	482	2834.15	162.5

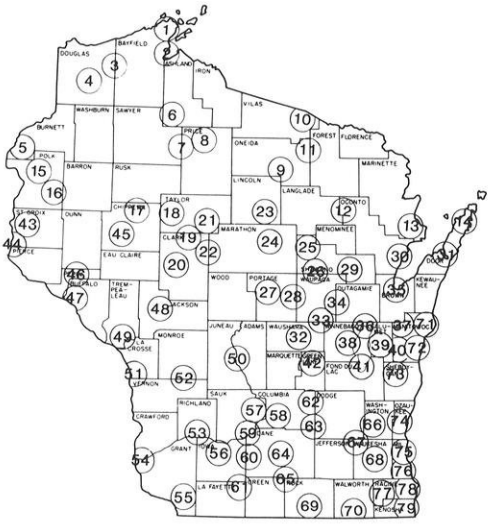


Figure 1. Locations of the 1990 Wisconsin Christmas Bird Counts.

Hwys. H and 54; Judy Allen, Rt. 2, Box 128, Black River Falls, WI 54615; (608) 488–4154. **Blanchardville** (61); 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. **Bowler** (25); Jct. Hwys N and D; Linda Slater, Rt. 1, Box 230, Birnamwood, WI; (715) 449–2664. **Bridgeport** (54); 2 miles SE of Bridgeport; Sam Robbins, 14 S. Roby Rd., Madison, WI 53705; (608) 233–3581. **Brule** (3); Jct. Hwys B and 27; Bernard Klugow, Box 13, Brule, WI 54820; (715) 372–4858. **Burlington** (77); Jct. Hwy A and Crossway Rd.; Gerald DeBoer, 2406 Kinzie Ave., Racine, WI 53405. **Caroline** (26); 2 miles W of Caroline; Mark Peterson, Box 53, Caroline, WI 54928; (715) 754–2661. **Chippewa Falls** (45); Jct. Hwys. 178 and S; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723 3815. **Clam Lake** (6); 7 miles SE of Clam Lake; Keith Merkel, 201 N. Ash Ave., Marshfield, WI 54449; (715) 384- 2383. **Clyde** (56); Jct. Hwy. ZZ and Weaver Rd.; Steven Greb, 3402 Rutland-Dunn Rd., Stoughton, WI 53589; (608) 295–3225. **Columbus** (63); Jct. Johnson and Jahnke Sts.; Phyllis Johnson, W12156 Johnson Rd., Columbus, WI 53925; (414) 623–2447. **Cooksville** (65); Cooksville; John Wilde, Rt. 1, Box 429, Evansville, WI 53536; (608) 882–5352. **Durand** (46); 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** (8); Fifield Post Office; Thomas Nicholls, 2160 Draper Ave., Roseville, MN 55113; (612) 636–2592. **Fond du Lac** (41); Jct. Tower and Cody Roads; Thomas Schultz, N 6104 Honeysuckle Lane, Green Lake, WI 54941; (414) 294–3021. **Fort Atkinson** (not compiled); Jct. Main St. and Sherman Ave.; Richard Wanie, W5920 Lee Dr., Fort Atkinson, WI 53538; (414) 563–6274. **Fremont** (33); Jct. Hwys. I and HH 4 miles SW of Fremont; Daryl Tessen, 2 Pioneer Park Place, Elgin, IL 60123; (708) 695–2464. **Gilman** (18); 1 mile W of Miller Dam; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659- 3910. **Grantsburg** (5); Jct. Hwys. 70 and 48; Dennis Allaman, 506 W. St. George, Grantsburg, WI 54840; (715) 463–2366. **Green Bay** (35); Jct. Allouez and S. Webster Avenues; John Jacobs, Neville Public Museum, 210 Museum Pl., Green Bay, WI 54303; (414) 448–4460. **Green Lake** (42); Jct. Hwy. J and Swamp Rd.; Thomas Schultz, N6104 Honeysuckle Lane,

Green Lake, WI 54941; (414) 294-3021. **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** (66); Jct. Hwys. 60 and 83; Judy Haseleu, 337 W. State St., Hartford, WI 53027; (414) 673–5865. **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** (not compiled); Jct. Main Ditch and Main Dike in Refuge; Bill Volkert, Wis. Dept. Natural Resources, 1210 N. Palmatory St., Horicon, WI 53032; (414) 485–3018. **Hudson** (44); Afton, MN; Boyd & Helen Lien, 5148 29th Ave. S., Minneapolis, MN 55417; (612) 729–5982. **Kenosha** (79); Jct. Hwys. 158 and HH (Kenosha Co. only); Ron Hoffmann, Box 886, Kenosha, WI 53141; (414) 654–5854. **Kettle Moraine** (not compiled); Hwy. DD, W of Auburn Lake; Bill Volkert, W996 Birchwood Dr., Campbellsport, WI 53010; (414) 533–8939. **Kickapoo Valley** (52); Jct. Hwys. T and 131; Eric Epstein, Rt. 2, Box 100, Norwalk, WI 54648; (608) 823–7837. **LaCrosse** (51); LaCrosse Courthouse; Fred Lesher, 509 Winona St., LaCrosse, WI 54603; (608) 783–1149. **Lake Geneva** (70); 42° 15′ Lat., 88° 30′ Long., near William Bay; Gaylord Culp, Rt. 3, Box 1, Lake Geneva, WI 53147; (414) 248–8177. **Lakewood** (12); Jct. Hwys. T and FR 2117; John Woodcock, 1718 Cedar Grove Dr., Apt. 3A, Manitowoc, WI 54220; (414) 684–0447. **Luck** (15); Jct. 180th St. and 180th Ave.; Howard Jorgenson, Rt. 2, Luck, WI; (715) 472–2769. **Madison** (64); State Capitol; Sam Robbins, 14 S. Roby Rd., Madison, WI 53705; (608) 233–3581. **Medford** (21); 2.5 miles NE of Whittlesey; Nick Risch, W5172 Allman Ave., Medford, WI 54451; (715) 748–6177. **Merrill** (23); 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** (60); Mount Horeb; Sharon & Warren Gaskill, 10405 Bell Rd., Black Earth, WI 53515; (608) 767–3642. **Nelson** (47); 1 mile S of Jct. Hwys. I and D; C.A. Kemper, 733 Maple St., Chippewa Falls, WI 54729; (715) 723–3815. **Newburg** (74); Jct. Hwy. 33 and Lakeland School Rd.; Julie Tubbs, Riveredge Nature Center, P.O. Box 26, Newburg, WI 53060; (414) 675–6888. **New Richmond** (43); 2 miles E of Boardman; Joseph Merchak, 210 Ilwaco Rd., River Falls, WI 54022; (715) 425–1169. **Oconomowoc** (67); Hwy 67, 2 miles N of Oconomowoc; Edward Peartree, 36516 Lisbon Rd., Oconomowoc, WI 53066; (414) 567–4086. **Oshkosh** (38); Jct. Hwys. 21 and 41; Thomas Ziebell, 1322 Ceape Ave., Oshkosh, WI 54901; (414) 235–0326. **Owen** (19); Hwy. D 2.5 miles N of Hwy. 29; Nick Risch, W5172 Allman Ave., Medford, WI 54451; (715) 748–6177. **Oxbo** (7); Jct. Hwys. EE and 70; Maybelle Hardy, Rt. 1, Box 263, Park Falls, WI 54552; (715) 762–3178. **Pensaukee** (30); Pensaukee; Thomas Erdman, 4093 Hwy. S, Route 2, Oconto, WI 54153; (414) 834–3416. **Peshtigo** (13); Leo Feller, 530 Rainbow Circle, Peshtigo, WI 54157; (715) 582–4117. **Phelps** (10); 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** (58); Jct. Hwys. 51 and CS; Mark & Sue Martin, Goose Pond Sanctuary, W7468 Prairie Lane, Arlington, WI 53911; (608) 635–4160. **Racine** (78); Hwy. H 0.5 miles S of Hwy. K (Racine Co. only); Gerald DeBoer, 2406 Kinzie Ave., Racine WI 53405; (414) 637–0393. **Randolph** (62); Hwy P midway between Cambria and Randolph; Charles Gilmore, 115 Meadowood Dr., Randolph, WI 53956; (414) 326–3221. **Rhinelander** (9); Rhinelander; Ced Vig, 919 Birch Bend, Rhinelander, WI 54501; (715) 363–3047. **Richland Center** (53); Jct. Hwys. O and OO SE of Richland Center; Robert Hirschy, University of Wisconsin Center-Richland, Richland Center, WI 53581; (608) 647–6186. **Sauk City** (59); 2.5 miles SE of Witwen; Kenneth Lange, Devils Lake State Park, S5975 Park Rd., Baraboo, WI 53913; (608) 356–8301. **Shawano** (29); 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. **Solon Springs** (4); Jct. Hwys. M and 53; Bernard Klugow and Berry Stanek, Box 13, Brule, WI 54820; (715) 372–4858. **Spencer** (22); Jct. Hwys. F and 153; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659–3910. **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** (39); Kloten Swamp, 3 miles SE of Stockbridge; Carroll Rudy, W3866 Hwy. H, Chilton, WI 53014; (414) 849–9021. **Sturgeon Bay** (31); Jct. Michigan and 3rd Ave. in Sturgeon Bay; Kurt Hagemeister, 1834 Florida St. B., Sturgeon Bay, WI; (414) 743–4397. **Three Lakes** (11); 6 miles E of Three Lakes; Bill Reardon, 2547 Hwy. 70 E, Eagle River, WI 54521; (715) 479–8055. **Trempealeau** (49); Jct. Hwy K and Fremont St., Trempealeau; Thomas Hunter, 575 Jay St., Trempealeau, WI 54661; (608) 534–6233. **Waukesha** (68); Jct. Hwy. D and Brookhill Rd. (old Hwy. ZZ); John Bielefeldt, N3066 Hardscrabble Rd., Dousman, WI 53118; (414) 495–8397. **Wausau** (24); Jct. Grand Ave. and Thomas St.; Duane Goetsch, 3005 Heron Ave., Wausau, WI 54401; (715) 845–2651. **Wautoma** (32); Mount Morris; Delbert Greenman, 1218 Hwy W, Redgranite, WI 54970; (414) 787–3036. **Willard** (20); 1 mile E and 1.5 miles S of Willard; Janice Luepke, B-894 Eau Pleine Rd., Spencer, WI 54479; (715) 659- 3910. **Woodland Dunes NW** (37), **NE** (71), **SW** (4), 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

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

Species	Bayfield (1)	Ashland (2)	Brule (3)	Solon Springs (4)	Grantsburg (5)	Clam Lake (6)	Oxbo (7)	Fifield (8)	Rhinelander (9)	Phelps (10)	Three Lakes (11)	Lakewood (12)	Peshtigo (13)	Ephraim (14)
Canada Goose	0	10	1	0	1677	0	0	0	0	0	0	0	0	118
Wood Duck	0	0	0	0	1	0	0	0	0	0	0	0	0	1
American Black Duck	0	105	2	0	0	0	0	0	0	0	0	0	0	4
Mallard	5	122	4	2	16	0	0	1	200	0	0	0	0	472
Common Goldeneye	62	86	2	9	0	0	0	1	0	0	0	0	22	170
Common Merganser	179	115	2	0	0	0	0	0	0	0	0	0	1	60
Bald Eagle	6	2	5	3	13	0	2	1	2	3	1	0	1	1
Northern Harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sharp-shinned Hawk	0	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	1	1	1
Northern Goshawk	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Red-tailed Hawk	0	0	0	1	0	0	1	0	0	0	0	0	1	2
Rough-legged Hawk	1	3	2	4	3	0	0	2	0	0	0	0	5	1
American Kestrel	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ring-necked Pheasant	0	0	0	0	0	0	0	0	0	0	0	0	1	12
Ruffed Grouse	3	6	10	21	4	9	10	10	2	4	5	1	0	6
Wild Turkey	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	42	4	0	0	0	0	0	0	0	0	0	0	0	2
Herring Gull	2518	117	0	0	0	0	0	0	0	0	0	0	1	798
Rock Dove	2	123	4	3	164	0	488	25	35	0	0	8	54	42
Mourning Dove	1	73	0	0	30	0	316	4	40	0	0	3	76	140
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	1	8	3	1	2	0	0	0	0	0	0	0	0	0
Barred Owl	1	0	1	1	0	0	1	0	0	*	0	0	0	0
Belted Kingfisher	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Red-headed Woodpecker	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-bellied Woodpecker	0	0	2	1	8	0	0	0	0	0	0	0	0	7
Downy Woodpecker	10	5	4	2	34	1	25	24	16	30	27	5	6	19
Hairy Woodpecker	9	9	3	5	15	5	26	26	19	15	6	1	7	26
Northern Flicker	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pileated Woodpecker	2	3	6	4	8	2	5	3	3	1	5	0	0	1
Horned Lark	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Blue Jay	152	73	44	32	77	11	28	27	24	27	6	14	71	35
American Crow	25	98	17	2	72	5	8	159	5	9	3	13	184	195
Common Raven	60	23	76	13	4	197	114	37	0	53	23	7	0	28
Black-capped Chickadee	134	162	220	103	304	217	254	510	209	310	136	58	158	220
Tufted Titmouse	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Red-breasted Nuthatch	2	4	6	10	3	7	11	20	12	40	9	0	3	21
White-breasted Nuthatch	6	11	4	13	55	4	5	39	15	20	9	3	7	45
Brown Creeper	0	0	2	0	0	2	2	2	1	2	0	1	0	1
Golden-crowned Kinglet	0	0	0	0	2	0	0	0	0	0	0	0	0	7
American Robin	0	0	0	1	0	0	*	0	0	0	0	0	0	20
Cedar Waxwing	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Northern Shrike	0	6	2	1	2	0	0	1	0	1	1	0	2	1
European Starling	457	645	4	0	127	0	0	89	0	13	40	0	129	317
Northern Cardinal	0	6	1	0	10	0	0	4	0	0	0	0	6	21
American Tree Sparrow	0	3	1	0	24	0	*	0	0	0	0	0	11	4
Song Sparrow	0	0	0	0	0	0	*	0	0	0	0	0	0	0
Dark-eyed Junco	0	*	2	2	20	0	0	1	3	0	1	0	47	31
Snow Bunting	0	0	31	1	75	0	0	0	9	0	0	0	0	2
Red-winged Blackbird	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Common Grackle	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pine Grosbeak	23	47	16	42	0	0	58	97	14	12	4	5	13	5
Purple Finch	0	0	0	0	0	0	5	0	0	0	0	0	6	4
House Finch	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Common Redpoll	43	1	0	1	66	0	1	0	0	0	0	0	0	16
Pine Siskin	3	*	0	0	20	0	3	6	0	0	0	0	2	68
American Goldfinch	4	33	4	5	269	0	69	137	23	11	0	2	100	225
Evening Grosbeak	69	24	16	56	29	18	66	240	86	69	31	15	14	3
House Sparrow	169	335	2	4	368	0	0	32	8	6	2	0	81	95
Total Species	40	43	41	32	36	15	23	31	20	20	19	15	32	51

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

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

Species	Luck (15)	Amery (16)	Holcombe (17)	Gilman (18)	Owen (19)	Willard (20)	Medford (21)	Spencer (22)	Merrill (23)	Wausau (24)	Bowler (25)	Caroline (26)	Stevens Point (27)	Amherst (28)
Canada Goose	1	0	0	0	0	0	1	46	0	0	0	0	3	0
Wood Duck	0	0	0	0	0	0	0	0	0	0	0	1	0	0
American Black Duck	0	2	0	0	0	0	0	0	1	*	0	5	21	0
Mallard	2	84	1	2	0	0	0	0	392	150	0	267	801	0
Common Goldeneye	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Common Merganser	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Bald Eagle	3	2	7	2	*	3	1	0	2	1	0	1	3	0
Northern Harrier	0	0	1	0	18	1	0	2	0	0	0	0	0	0
Sharp-shinned Hawk	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Cooper's Hawk	0	0	0	0	3	0	0	0	0	*	0	0	4	0
Northern Goshawk	0	0	0	2	3	0	2	1	0	*	1	0	0	0
Red-tailed Hawk	2	1	2	1	44	8	1	55	6	0	1	2	6	4
Rough-legged Hawk	1	4	5	9	72	15	12	61	7	*	1	3	7	1
American Kestrel	0	0	0	1	12	0	1	16	1	0	0	0	1	1
Ring-necked Pheasant	4	0	0	0	*	0	0	1	0	0	0	2	0	0
Ruffed Grouse	3	6	2	20	22	9	9	10	20	*	*	2	*	7
Wild Turkey	7	2	0	0	0	0	0	0	0	0	0	0	0	3
Ring-billed Gull	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Herring Gull	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Dove	29	44	259	145	488	177	164	982	286	164	21	62	152	16
Mourning Dove	3	3	13	13	316	87	121	365	73	86	20	146	198	42
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Horned Owl	4	3	0	2	5	0	4	24	2	0	1	1	*	2
Barred Owl	0	1	0	0	4	1	2	5	0	0	0	0	*	2
Belted Kingfisher	0	0	1	0	2	0	0	0	0	0	1	0	1	1
Red-headed Woodpecker	0	0	0	0	0	3	0	1	0	0	0	1	2	1
Red-bellied Woodpecker	18	1	5	1	16	19	3	12	0	2	9	6	9	1
Downy Woodpecker	33	4	21	32	65	58	25	53	14	3	39	24	29	19
Hairy Woodpecker	24	3	15	32	41	32	23	16	15	2	28	15	14	10
Northern Flicker	4	0	0	0	2	0	0	1	0	*	0	0	0	0
Pileated Woodpecker	13	7	2	0	4	1	2	0	3	1	2	1	3	1
Horned Lark	0	0	0	0	23	36	4	124	0	0	0	0	21	2
Blue Jay	58	36	128	62	224	242	159	156	89	34	108	111	293	97
American Crow	41	27	252	201	656	371	704	584	177	0	28	89	309	129
Common Raven	1	8	3	71	17	9	12	0	7	51	3	0	0	1
Black-capped Chickadee	185	220	460	409	855	461	956	363	521	46	219	194	498	89
Tufted Titmouse	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Nuthatch	1	4	2	0	2	4	4	1	2	*	6	5	11	5
White-breasted Nuthatch	71	6	34	22	90	38	40	31	22	6	32	49	60	37
Brown Creeper	0	2	1	0	0	0	0	0	0	*	0	1	0	0
Golden-crowned Kinglet	0	2	0	1	3	0	0	2	0	*	0	0	0	0
American Robin	2	0	0	0	*	1	0	0	0	0	0	0	0	0
Cedar Waxwing	1	0	0	0	1	0	0	0	0	0	0	9	0	2
Northern Shrike	1	1	5	16	21	2	13	23	17	0	1	3	2	0
European Starling	62	75	192	89	786	185	2149	1571	163	152	67	19	101	69
Northern Cardinal	47	9	12	1	51	73	28	52	23	3	12	47	86	23
American Tree Sparrow	32	2	98	25	558	57	65	98	4	0	5	22	70	9
Song Sparrow	18	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark-eyed Junco	39	16	5	0	41	47	1	41	0	4	51	106	195	193
Snow Bunting	*	42	15	140	487	419	359	178	303	*	5	0	16	36
Red-winged Blackbird	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Common Grackle	6	0	0	0	3	0	2	1	0	0	0	0	1	0
Pine Grosbeak	0	16	0	0	0	0	0	0	9	3	2	2	0	0
Purple Finch	1	2	0	0	15	0	0	0	0	0	24	8	13	1
House Finch	0	0	0	0	0	0	0	0	0	*	0	0	31	0
Common Redpoll	*	2	15	29	6	6	8	0	1	0	0	1	*	0
Pine Siskin	75	0	30	0	52	0	41	0	17	1	8	8	0	0
American Goldfinch	123	12	54	118	341	587	107	147	33	10	359	330	507	136
Evening Grosbeak	1	22	69	221	12	56	304	0	73	0	387	84	53	5
House Sparrow	218	42	515	281	2509	1391	955	2932	210	298	211	118	416	5
Total Species	36	40	31	28	41	34	34	36	31	19	29	35	38	33

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

Table 4. Number of species found in northeastern Wisconsin on 16 or more counts.

Species	Shawano (29)	Pensaukee (30)	Sturgeon Bay (31)	Wautoma (32)	Fremont (33)	Shiocton (34)	Green Bay (35)	Appleton (36)	Woodland Dunes NW (37)	Oshkosh (38)	Stockbridge (39)	Woodland Dunes SW (40)	Fond du Lac (41)	Green Lake (42)
Canada Goose	2	*	75	0	0	2	1170	172	0	480	0	1308	283	20000
Wood Duck	0	0	0	4	0	0	1	1	0	1	0	0	0	0
American Black Duck	5	3	3	0	10	0	447	113	0	55	0	1	16	7
Mallard	31	4	78	248	216	0	3320	1643	0	1418	0	43	193	118
Common Goldeneye	0	0	58	0	13	0	0	313	0	133	0	0	8	204
Common Merganser	0	0	0	0	1	0	148	80	0	102	117	0	200	738
Bald Eagle	1	1	0	*	2	0	*	4	0	0	0	0	0	6
Northern Harrier	1	1	1	0	1	0	0	0	0	7	0	0	0	0
Sharp-shinned Hawk	3	*	0	*	0	0	0	0	0	1	1	0	0	0
Cooper's Hawk	1	*	0	1	0	1	1	0	0	0	0	0	1	1
Northern Goshawk	0	*	1	0	0	0	*	0	0	1	0	0	1	0
Red-tailed Hawk	3	10	2	7	32	38	33	26	0	17	18	6	9	14
Rough-legged Hawk	6	9	6	7	57	10	11	2	0	7	0	2	3	11
American Kestrel	9	3	0	0	17	19	26	12	2	24	9	8	18	4
Ring-necked Pheasant	4	*	0	4	1	0	9	11	0	7	0	0	5	3
Ruffed Grouse	3	4	1	2	0	0	1	3	5	0	*	4	2	0
Wild Turkey	0	0	0	29	0	0	0	0	0	0	0	0	0	0
Ring-billed Gull	0	0	0	0	0	0	9	125	0	9	0	0	800	8
Herring Gull	2	0	11	0	0	0	286	80	57	282	90	0	2000	43
Rock Dove	79	13	69	50	255	657	855	54	2	507	416	115	254	256
Mourning Dove	163	273	74	126	465	263	470	510	23	475	70	73	162	256
Eastern Screech-Owl	0	*	0	0	0	1	1	1	0	1	1	0	0	0
Great Horned Owl	3	2	*	1	3	0	4	1	5	2	*	1	0	3
Barred Owl	2	1	0	1	1	0	1	0	0	0	0	0	0	0
Belted Kingfisher	0	0	0	1	1	0	0	0	0	1	0	0	0	0
Red-headed Woodpecker	6	0	0	2	0	0	1	1	0	0	4	0	0	2
Red-bellied Woodpecker	13	2	1	19	10	12	7	6	0	9	7	1	5	11
Downy Woodpecker	30	15	23	32	46	26	22	18	5	36	27	7	11	36
Hairy Woodpecker	29	6	12	19	20	9	10	10	5	8	13	4	7	12
Northern Flicker	2	1	0	0	5	0	1	1	0	0	0	0	0	0
Pileated Woodpecker	2	3	0	2	2	1	0	0	0	0	0	0	0	2
Horned Lark	2	2	0	0	0	45	142	0	0	73	25	1	24	*
Blue Jay	88	31	18	348	121	116	57	26	23	61	37	26	40	45
American Crow	214	3	22	318	215	108	90	243	21	93	27	17	42	123
Common Raven	4	*	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	146	82	81	288	125	183	134	89	41	163	84	43	66	157
Tufted Titmouse	2	0	0	1	0	0	0	0	0	0	0	0	0	0
Red-breasted Nuthatch	64	0	4	26	5	2	5	3	9	6	0	1	3	5
White-breasted Nuthatch	31	6	14	92	32	39	48	31	0	46	15	8	13	46
Brown Creeper	5	0	0	0	2	2	3	0	0	3	0	0	0	1
Golden-crowned Kinglet	0	0	3	0	0	4	0	0	6	7	0	0	3	8
American Robin	0	0	1	0	0	1	2	10	0	9	0	0	1	32
Cedar Waxwing	3	6	0	0	1	0	*	61	0	0	0	0	0	37
Northern Shrike	6	3	3	2	3	6	2	2	0	0	1	2	3	0
European Starling	707	145	138	61	301	497	768	139	36	720	297	211	324	50
Northern Cardinal	34	2	15	92	52	86	67	47	18	77	24	8	24	52
American Tree Sparrow	51	68	16	31	48	131	120	51	1	512	36	45	78	125
Song Sparrow	0	0	0	0	0	*	0	0	1	3	0	0	0	1
Dark-eyed Junco	109	23	38	516	165	264	193	184	17	202	51	21	72	211
Snow Bunting	10	*	*	0	0	100	8	0	0	75	500	0	0	56
Red-winged Blackbird	0	*	0	0	0	1	0	1	0	4	0	0	0	0
Common Grackle	0	*	0	3	2	0	0	3	0	4	*	0	0	0
Pine Grosbeak	11	7	0	0	0	0	0	0	0	0	0	0	0	0
Purple Finch	7	3	2	20	0	0	7	6	0	0	1	0	0	25
House Finch	23	0	0	0	0	0	0	58	0	12	0	0	0	0

(continued)

Table 4. (*Continued*)

Species	Shawano (29)	Pensaukee (30)	Sturgeon Bay (31)	Wautoma (32)	Fremont (33)	Shiocton (34)	Green Bay (35)	Appleton (36)	Woodland Dunes NW (37)	Oshkosh (38)	Stockbridge (39)	Woodland Dunes SW (40)	Fond du Lac (41)	Green Lake (42)
Common Redpoll	8	0	3	0	0	0	0	0	0	*	26	0	0	0
Pine Siskin	25	*	39	26	0	0	3	0	0	40	0	0	0	0
American Goldfinch	295	92	109	349	120	77	157	92	33	137	66	19	45	118
Evening Grosbeak	33	*	0	32	2	0	0	0	0	0	*	0	0	0
House Sparrow	341	53	40	79	477	982	1400	183	17	1726	349	418	612	148
Total Species	52	33	34	36	39	33	51	49	21	52	27	26	40	49

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

party hours). Rarer 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 the general abundance of various groups of species follows.

Waterfowl.—Because of the substantial amount of open water, waterfowl numbers were distinctly higher than normal for most species. Common Loons were reported for the first time in 3 years (5 and 2 counts) and a record number of Double-crested Cormorants was seen (17). The count of Tundra Swans was about normal; the 71 Mute Swans was a new record. Other species occurring in unusually high numbers were Snow Geese (most since 1982), Wood Ducks (most since 1972), Northern Pintails (most since 1981), Blue-winged Teal (most since 1974), Northern Shovelers (most since 1982), Common Goldeneyes (most since 1972), and Buffleheads (most since 1974). Only Oldsquaws (lowest number in at least 30 years) and Greater Scaup (lowest number since 1978, except for last year) were seen in well below normal numbers. Green-winged Teal were not found for the first time since 1982. This was the first year that Harlequin Ducks have been found on more than one count (3).

Hawks and Eagles.—Bald Eagles were found on a record number of counts (45) because of the large amount of open water that caused them to be scattered over much of the state, but the total was 15% lower than normal because they had not yet become concentrated below dams where they could be easily counted. Among Accipiters, the flight of Northern Goshawks was distinctly below normal, but there was a record number of Cooper's Hawks and above normal numbers of Sharp-shinned Hawks. It was an excellent year for the three common winter hawks, with a record number of American Kestrels and counts of Red-tailed and Rough-legged Hawks that were exceeded only by last year's record totals.

Grouse, Pheasants, Quail, etc.—The explosion of the Wild Turkey population continued, with a record 1693 being reported this year and an indication that their range is expand-

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

Species	New Richmond (43)	Hudson (44)	Chippewa Falls (45)	Durand (46)	Nelson (47)	Black River Falls (48)	Trempealeau (49)	Adams (50)	LaCrosse (51)	Kickapoo Valley (52)	Richland Center (53)	Bridgeport (54)	Platteville (55)	Clyde (56)
Canada Goose	1435	288	0	0	0	0	1	5	35	0	220	0	0	0
Wood Duck	0	1	0	0	0	0	0	0	2	1	0	0	0	0
American Black Duck	3	4	20	0	0	0	*	3	5	0	0	2	0	0
Mallard	46	442	517	0	29	0	19	27	679	4	126	391	0	0
Common Goldeneye	12	27	39	0	7	0	2	0	7	0	3	25	0	0
Common Merganser	0	17	1	0	7	0	1	0	1040	0	147	180	0	0
Bald Eagle	1	3	1	9	7	*	1	4	29	1	13	22	1	6
Northern Harrier	2	0	0	2	0	0	0	0	0	0	3	0	0	0
Sharp-shinned Hawk	0	1	0	0	1	*	0	0	1	0	0	1	0	0
Cooper's Hawk	1	0	*	0	0	0	*	0	2	1	1	2	0	0
Northern Goshawk	0	0	1	1	0	0	0	0	0	0	1	0	0	0
Red-tailed Hawk	7	4	1	24	25	5	8	1	34	62	95	59	17	19
Rough-legged Hawk	7	0	1	7	8	5	5	3	1	7	17	5	1	25
American Kestrel	4	1	0	9	5	1	3	0	13	3	30	6	1	4
Ring-necked Pheasant	4	5	*	0	0	4	0	0	0	0	6	3	0	0
Ruffed Grouse	1	0	0	1	9	8	1	2	17	6	14	0	1	6
Wild Turkey	0	0	0	24	56	24	9	15	28	112	558	202	23	162
Ring-billed Gull	0	0	0	0	0	0	0	0	0	0	0	29	0	0
Herring Gull	0	1	0	0	0	0	0	0	10	0	0	1	0	0
Rock Dove	181	42	51	428	355	17	96	57	413	170	1078	430	42	45
Mourning Dove	57	4	40	143	3	43	63	24	154	22	285	38	17	5
Eastern Screech-Owl	0	0	0	0	0	0	0	0	0	2	0	4	0	0
Great Horned Owl	1	0	0	5	0	*	0	0	2	4	12	13	0	3
Barred Owl	1	0	0	2	0	0	2	0	3	0	1	2	1	0
Belted Kingfisher	3	1	0	0	0	0	1	1	4	2	2	4	3	1
Red-headed Woodpecker	0	0	0	0	0	0	1	3	3	0	4	8	0	0
Red-bellied Woodpecker	6	12	0	8	26	10	42	6	54	51	65	77	9	8
Downy Woodpecker	27	10	8	18	34	29	51	15	72	37	96	116	23	7
Hairy Woodpecker	6	6	*	10	8	22	23	7	30	10	41	52	6	5
Northern Flicker	0	1	0	0	2	0	2	0	0	0	2	2	1	0
Pileated Woodpecker	0	2	0	0	3	3	4	3	7	1	15	20	0	0
Horned Lark	1	0	0	7	8	0	10	0	48	13	78	47	35	9
Blue Jay	81	48	59	86	194	123	127	157	172	211	298	89	34	13
American Crow	265	235	44	190	342	278	161	60	252	229	580	220	99	82
Common Raven	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Black-capped Chickadee	135	101	125	103	185	96	133	139	372	170	287	223	75	54
Tufted Titmouse	0	1	3	0	0	1	0	0	1	3	11	34	20	0
Red-breasted Nuthatch	0	0	0	2	2	5	1	4	15	0	2	3	9	0
White-breasted Nuthatch	15	37	13	14	54	45	58	19	115	41	110	154	20	17
Brown Creeper	0	0	0	0	0	1	*	0	6	3	1	0	0	1
Golden-crowned Kinglet	0	0	0	1	0	*	0	0	47	3	0	9	0	2
American Robin	0	0	0	0	0	0	3	0	26	1	0	0	0	0
Cedar Waxwing	67	90	0	0	0	0	28	0	18	8	0	112	0	0
Northern Shrike	3	1	0	3	1	2	0	0	1	0	3	0	0	0
European Starling	126	84	21	643	317	11	167	38	493	228	1058	513	50	26
Northern Cardinal	40	25	20	74	168	73	190	23	293	231	691	309	92	29
American Tree Sparrow	214	401	32	233	70	20	46	39	439	83	314	632	22	1
Song Sparrow	0	0	0	0	0	0	0	0	1	0	7	6	9	0
Dark-eyed Junco	133	102	73	357	228	254	475	95	491	251	1085	559	146	88
Snow Bunting	7	0	0	0	0	0	0	0	0	5	9	18	0	0
Red-winged Blackbird	0	0	0	0	0	0	1	0	62	*	1	41	1	0
Common Grackle	0	1	*	1	0	0	0	0	1	0	26	1	0	0
Pine Grosbeak	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purple Finch	15	33	2	0	5	64	59	9	8	8	23	10	37	1
House Finch	0	0	16	0	1	0	0	0	10	0	1	13	4	0

(*continued*)

Table 5. (*Continued*)

Species	New Richmond (43)	Hudson (44)	Chippewa Falls (45)	Durand (46)	Nelson (47)	Black River Falls (48)	Trempealeau (49)	Adams (50)	LaCrosse (51)	Kickapoo Valley (52)	Richland Center (53)	Bridgeport (54)	Platteville (55)	Clyde (56)
Common Redpoll	0	0	0	0	0	*	0	0	0	0	0	0	0	0
Pine Siskin	24	0	0	0	0	37	12	7	12	0	2	1	16	0
American Goldfinch	69	30	81	211	141	283	218	122	269	480	807	236	63	17
Evening Grosbeak	0	0	0	0	0	220	0	10	0	0	1	0	0	0
House Sparrow	662	137	179	2083	995	148	632	28	1217	812	2779	2016	455	131
Total Species	41	36	26	31	32	29	40	33	57	40	54	56	36	27

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

ing. As expected, snow cover slightly reduced the count of Ruffed Grouse and favored counts of open country species. The 238 Northern Bobwhites on 11 counts was the highest total ever recorded on a Wisconsin Christmas Count, and the 369 Gray Partridges was the highest number since 1983. However, the Ring-necked Pheasant population continued well below the average for the previous 10 years.

Gulls and Other Waterbirds.—Favored by an abundance of open water, Ring-billed Gulls were found in a record number, and Herring Gulls were much more abundant than usual. There were also 5 Glaucous Gulls, 129 Bonaparte's Gulls, and a Thayer's Gull. More American Coots were seen than in any year since 1979. Numbers of Great Blue Herons and Common Snipe were about normal, but no rails were found this year and Killdeers were missing from the counts for the first time in 26 years.

Doves.—Rock Doves were less abundant than in the previous ten years, while the count of Mourning Doves, which seem to be favored by bird feeders, remained very high.

Owls.—The 33 Short-eared Owls (22 at Mount Horeb) was the highest total in at least 25 years, and the number of Screech Owls (196, with 123 at Madison) was very high. The latter are especially prevalent in urban and rural areas with mature trees and bird feeders, where they are apparently attracted at night to rodents feeding under the feeders. Other owls occurred in normal numbers, except the Barred Owl, which was encountered less frequently than in most years.

Woodpeckers.—The Red-bellied Woodpecker population continues to expand, with the number reported in 1990 only slightly lower than last year's record. The number of Pileated Woodpeckers also remained high, but numbers of the migratory species (Northern Flicker, Yellow-bellied Sapsucker, and Red-headed Woodpecker) were low this year; Red-headed Woodpeckers were exceptionally scarce.

Jays, Crows, Chickadees, Nuthatches, etc..—Numbers of Blue Jays, Gray Jays (lowest since 1980), American Crows, and Red-breasted Nuthatches were below average, especially the latter, which last year was present in excep-

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

Species	Baraboo (57)	Poynette (58)	Sauk City (59)	Mount Horeb (60)	Blanchardville (61)	Randolph (62)	Columbus (63)	Madison (64)	Cooksville (65)	Hartford (66)	Oconomowoc (67)	Waukesha (68)	Beloit (69)	Lake Geneva (70)
Canada Goose	136	2	7	0	0	4004	950	488	330	238	885	304	39	4759
Wood Duck	0	1	2	0	2	0	0	2	0	0	1	2	0	2
American Black Duck	2	11	5	0	0	0	7	78	35	25	2	27	8	0
Mallard	21	468	281	4	2	0	98	4481	344	20	853	593	1273	218
Common Goldeneye	0	6	69	0	0	0	0	317	7	0	11	25	1169	692
Common Merganser	1	50	181	0	0	0	0	282	0	0	2	0	1	2
Bald Eagle	1	4	38	2	0	0	0	*	1	0	0	0	0	0
Northern Harrier	0	1	1	1	0	1	0	1	0	1	2	0	1	1
Sharp-shinned Hawk	2	3	3	3	0	0	1	4	1	2	0	0	0	0
Cooper's Hawk	2	4	4	4	0	0	1	5	3	*	4	1	2	0
Northern Goshawk	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Red-tailed Hawk	42	68	78	77	18	3	3	63	6	19	36	20	18	11
Rough-legged Hawk	12	12	27	8	0	0	0	3	0	1	*	2	3	0
American Kestrel	8	16	11	15	3	6	20	28	9	14	5	21	13	11
Ring-necked Pheasant	0	8	5	15	0	*	5	32	25	*	2	5	44	0
Ruffed Grouse	6	4	16	14	0	0	0	1	0	0	0	0	0	0
Wild Turkey	16	22	245	92	0	0	0	0	0	33	0	0	0	0
Ring-billed Gull	0	0	2	0	0	0	0	480	0	0	3	14	2	506
Herring Gull	0	0	14	0	0	0	0	457	0	5	0	10	1	39
Rock Dove	508	355	716	479	75	132	222	800	215	428	155	196	236	418
Mourning Dove	44	315	320	188	27	418	551	1160	16	143	157	382	486	37
Eastern Screech-Owl	0	6	10	0	0	0	0	123	10	2	0	7	0	0
Great Horned Owl	4	8	14	7	9	0	1	40	*	6	3	12	1	1
Barred Owl	0	0	3	3	0	0	0	1	1	1	0	1	0	0
Belted Kingfisher	0	0	0	1	2	0	0	5	0	0	1	3	2	0
Red-headed Woodpecker	0	3	1	1	0	0	1	2	0	0	0	0	3	4
Red-bellied Woodpecker	16	56	67	35	8	0	1	63	6	9	12	6	13	5
Downy Woodpecker	47	103	126	50	17	5	16	304	28	60	37	36	37	24
Hairy Woodpecker	9	27	60	27	4	2	2	86	4	9	12	12	7	4
Northern Flicker	1	3	5	*	1	0	1	6	0	2	2	2	3	11
Pileated Woodpecker	7	1	13	1	1	0	0	0	0	0	0	1	0	0
Horned Lark	0	209	51	116	44	241	73	25	198	14	3	6	1	13
Blue Jay	155	534	358	165	15	23	43	386	26	62	78	108	85	41
American Crow	342	522	756	559	45	41	93	1268	68	161	281	270	1160	126
Common Raven	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-capped Chickadee	135	437	430	215	34	3	15	991	44	222	198	204	182	92
Tufted Titmouse	2	15	9	12	0	0	0	1	0	0	1	0	4	0
Red-breasted Nuthatch	4	24	16	0	0	0	4	24	3	9	3	15	3	2
White-breasted Nuthatch	42	120	117	92	17	3	9	311	10	56	25	51	55	21
Brown Creeper	0	5	11	*	0	0	0	54	*	1	*	8	5	1
Golden-crowned Kinglet	0	10	13	10	2	0	0	54	0	0	1	11	0	0
American Robin	1	1	3	*	0	0	0	108	0	0	0	32	2	2
Cedar Waxwing	0	203	23	0	0	0	0	295	0	2	27	53	32	0
Northern Shrike	1	3	1	0	0	0	0	2	0	1	0	0	0	0
European Starling	73	241	382	438	200	165	544	4003	64	464	487	638	3393	538
Northern Cardinal	82	341	337	232	30	3	15	459	46	114	108	142	114	15
American Tree Sparrow	69	369	635	61	175	431	89	618	205	139	151	160	104	472
Song Sparrow	1	7	5	15	2	*	1	40	1	7	0	4	19	4
Dark-eyed Junco	230	1041	891	441	130	397	273	922	126	260	270	168	404	129
Snow Bunting	0	562	11	0	0	500	288	0	163	22	0	1	0	0
Red-winged Blackbird	0	0	4	0	2	1	0	246	3	0	26	0	0	0
Common Grackle	0	1	0	222	0	0	0	228	0	0	2	0	300	0
Pine Grosbeak	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purple Finch	13	137	95	2	1	0	14	49	14	10	30	14	1	12
House Finch	1	83	7	2	0	0	0	271	26	17	4	1	0	0
Common Redpoll	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Pine Siskin	1	33	17	0	0	0	0	59	2	4	0	0	0	4
American Goldfinch	112	681	396	268	20	51	80	405	105	138	104	76	65	209
Evening Grosbeak	*	0	0	0	0	0	0	0	0	0	0	0	0	0
House Sparrow	417	1820	1062	1132	775	256	501	3347	267	566	788	583	980	602
Total Species	41	61	61	43	31	22	33	84	35	42	47	52	52	40

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

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

Species	Woodland Dunes NE (71)	Woodland Dunes SE (72)	Plymouth (73)	Newburg (74)	Milwaukee (75)	Hales Corners (76)	Burlington (77)	Racine (78)	Kenosha (79)	Number of counts	Total birds	Percent change
Canada Goose	201	385	50	1992	1583	0	606	1448	2040	43	47780	− 24%
Wood Duck	0	0	0	0	0	0	0	7	*	18	33	+ 87%
American Black Duck	8	13	10	5	78	0	8	38	2	41	1199	− 15%
Mallard	81	208	486	517	965	155	253	793	530	59	24751	+ 6%
Common Goldeneye	40	40	5	76	371	36	75	145	15	39	4304	+ 35%
Common Merganser	3	38	0	30	4	0	0	0	2	32	3734	+ 50%
Bald Eagle	0	0	0	0	0	0	0	0	0	45	223	− 15%
Northern Harrier	0	0	0	1	0	0	1	1	1	25	54	+ 2%
Sharp-shinned Hawk	1	0	2	7	1	0	2	1	*	25	46	+ 27%
Cooper's Hawk	1	1	1	1	1	1	0	0	0	32	59	+ 131%
Northern Goshawk	0	0	0	0	0	0	0	0	0	16	20	− 25%
Red-tailed Hawk	1	3	8	41	10	11	10	15	5	67	1280	+ 38%
Rough-legged Hawk	0	0	0	3	0	0	0	1	0	56	514	+ 59%
American Kestrel	4	4	6	45	12	11	2	32	2	55	563	+ 27%
Ring-necked Pheasant	3	1	4	10	2	2	1	3	1	36	254	− 28%
Ruffed Grouse	4	0	8	4	0	0	0	0	0	52	349	− 14%
Wild Turkey	0	0	29	0	0	0	0	0	0	22	1693	+ 536%
Ring-billed Gull	12	55	*	990	1746	302	4	969	520	24	6634	+ 156%
Herring Gull	1203	158	*	645	1523	27	0	1039	12	29	11430	+ 42%
Rock Dove	16	112	78	991	359	88	21	227	51	76	17802	− 14%
Mourning Dove	153	48	97	996	666	167	16	775	20	74	13752	+ 61%
Eastern Screech-Owl	0	1	0	13	1	8	2	2	*	19	196	+ 55%
Great Horned Owl	3	1	0	30	1	6	2	2	*	51	279	+ 11%
Barred Owl	0	4	*	7	0	0	0	0	0	30	58	− 21%
Belted Kingfisher	1	2	3	7	3	0	1	*	*	32	65	+ 13%
Red-headed Woodpecker	0	2	0	0	0	0	0	0	*	24	60	− 72%
Red-bellied Woodpecker	2	5	8	30	3	4	0	8	*	63	954	+ 33%
Downy Woodpecker	17	18	17	168	43	16	5	48	3	79	2729	+ 6%
Hairy Woodpecker	6	10	5	49	13	4	3	5	1	78	1193	− 11%
Northern Flicker	0	0	*	8	1	0	0	2	*	28	76	− 33%
Pileated Woodpecker	0	0	0	0	0	0	0	0	0	45	177	+ 24%
Horned Lark	16	4	3	34	0	0	54	12	5	45	1903	+ 54%
Blue Jay	37	30	60	322	13	28	15	61	3	79	7795	− 14%
American Crow	89	61	87	685	635	171	64	278	22	78	16724	− 21%
Common Raven	0	0	0	0	0	0	0	0	0	25	823	+ 52%
Black-capped Chickadee	116	63	70	1076	294	26	45	194	12	79	17258	+ 7%
Tufted Titmouse	0	0	0	0	0	0	0	1	0	19	124	+ 54%
Red-breasted Nuthatch	5	1	0	8	7	2	2	23	1	65	527	− 30%
White-breasted Nuthatch	19	21	19	177	33	10	11	21	1	78	3148	− 8%
Brown Creeper	0	2	0	5	1	4	0	3	*	34	145	− 25%
Golden-crowned Kinglet	19	4	0	3	1	1	7	8	*	31	254	+ 30%
American Robin	0	0	0	5	58	8	0	1	*	25	331	− 12%
Cedar Waxwing	0	0	0	340	216	30	39	97	*	28	1803	+ 35%
Northern Shrike	0	0	0	3	2	4	0	0	0	47	186	+ 39%
European Starling	191	81	335	1932	893	713	63	996	80	74	32584	− 74%
Northern Cardinal	48	30	44	432	122	42	22	84	6	71	6239	+ 50%
American Tree Sparrow	59	8	49	316	80	193	760	75	30	69	10195	− 28%
Song Sparrow	0	0	0	14	7	2	5	6	1	26	189	+ 5%
Dark-eyed Junco	95	157	111	668	250	74	96	202	41	71	14625	− 20%
Snow Bunting	12	81	0	0	0	0	1	40	0	37	4587	− 19%
Red-winged Blackbird	4	0	0	1	0	0	11	*	*	19	412	− 85%
Common Grackle	1	0	0	16	0	0	0	1	*	22	826	+ 213%
Pine Grosbeak	0	0	0	0	0	0	0	0	0	19	386	− 46%
Purple Finch	10	2	9	12	2	0	0	8	2	51	861	− 32%
House Finch	6	184	2	10	66	8	0	66	*	27	925	+1119%
Common Redpoll	0	0	0	0	0	0	0	0	8	19	243	− 92%
Pine Siskin	20	3	0	2	13	8	0	6	*	40	750	− 83%
American Goldfinch	119	55	142	454	144	64	5	83	31	77	12289	+ 16%
Evening Grosbeak	4	0	26	0	0	0	0	0	0	34	2351	− 68%
House Sparrow	215	201	377	2115	1044	230	140	755	236	76	49711	− 17%
Total Species	44	46	36	62	62	42	37	58	35			

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

tional numbers. Common Ravens occurred in the greatest number since 1979, and the Tufted Titmouse population remained high for the second consecutive year.

Creepers, Kinglets, Wrens, and Warblers.—The counts of Brown Creepers was down, but Golden-crowned Kinglets were more numerous than in most years. The number of Winter Wrens

Table 8. Species found on 14 or fewer counts.

Species	Number of counts	Number of birds	Count and number
Common Loon	2	5	Bayfield 1, Madison 4
Pied-billed Grebe	2	2	Green Lake 1, Madison 1
Horned Grebe	1	1	Ephraim 1
Double-crested Cormorant	4	17	Green Bay 13, Appleton 2, Madison 1, Woodland Dunes SE 1
Great Blue Heron	5	8	Brule 1, Grantsburg 1, Chippewa Falls 1, Appleton 4, (Madison), Racine 1
Tundra Swan	5	63	Bayfield 22, Ashland 24, (Ephraim), (Oshkosh), Fond du Lac 10, LaCrosse 6, Plymouth 1
Trumpeter Swan	1	6	Grantsburg 6
Mute Swan	8	71	Brule 1, Solon Springs 11, Shawano 3, Stevens Point 3, Green Lake 2, Madison 3, Waukesha 47, Beloit 1
Snow Goose	4	51	Green Bay 1, Appleton 1, LaCrosse 48, (Cooksville), Lake Geneva 1
Northern Pintail	5	10	Ashland 2, Green Bay 2, Adams 3, Poynette 1, Burlington 2
Blue-winged Teal	2	5	Trempealeau 1, Beloit 4
Northern Shoveler	3	128	Green Bay 4, Madison 123, Oconomowoc 1
Gadwall	3	349	Madison 335, Oconomowoc 2, Waukesha 12, (Plymouth)
American Wigeon	4	21	Appleton 3, Green Lake 1, Madison 16, Beloit 1
Canvasback	5	27	Ashland 1, Oshkosh 6, Fond du Lac 3, Madison 6, Racine 11
Redhead	3	6	Ephraim 1, Waukesha 4, Milwaukee 1
Ring-necked Duck	6	13	Green Bay 1, Green Lake 3, Madison 2, Waukesha 3, Lake Geneva 1, Newburg 3
Greater Scaup	8	1039	Ephraim 5, Madison 3, Woodland Dunes SE 1, Milwaukee 957, Hales Corners 31, Newburg 4, Racine 34, Kenosha 4
Lesser Scaup	13	36	Bayfield 5, Brule 1, Shawano 2, Fond du Lac 1, Adams 1, LaCrosse 4, Green Lake 2, Madison 8, Oconomowoc 2, Woodland Dunes SE 1, Plymouth 1, Milwaukee 4, Racine 4
scaup species	1	5	Oshkosh 5
Harlequin Duck	3	6	Madison 1, Milwaukee 4, Racine 1
Oldsquaw	7	92	Ephraim 11, Madison 1, Woodland Dunes SE 4, Newburg 13, Milwaukee 36, Hales Corners 4, Kenosha 23
Black Scoter	1	1	Madison 1
Surf Scoter	1	1	Milwaukee 1
White-winged Scoter	1	1	Newburg 1
Barrow's Goldeneye	1	2	Newburg 2
Bufflehead	14	621	Bayfield 5, Ashland 3, Ephraim 47, Sturgeon Bay 33, Appleton 3, Oshkosh 1, LaCrosse 1, Madison 24, Oconomowoc 1, Lake Geneva 25, Woodland Dunes SE 4, Milwaukee 351, Racine 122, Kenosha 1
Hooded Merganser	11	23	Ashland 1, Stevens Point 1, Fremont 1, Appleton 3, Fond du Lac 1, LaCrosse 1, Green Lake 2, Madison 3, Beloit 3, Newburg 5, Hales Corners 2
Red-breasted Merganser	11	272	Bayfield 6, Ephraim 4, Madison 3, Oconomowoc 3, Woodland Dunes NE 4, Woodland Dunes SE 9, Newburg 17, Milwaukee 144, Hales Corners 15, Racine 53, Kenosha 14
merganser species	1	1	New Richmond 1
Ruddy Duck	3	14	Green Lake 3, Madison 10, Milwaukee 1
Red-shouldered Hawk	5	5	(Green Bay), Richland Center 1, Bridgeport 1, Poynette 1, Sauk City 1, Milwaukee 1
Golden Eagle	2	4	Kickapoo Valley 3, Bridgeport 1
Peregrine Falcon	1	1	Madison 1
Gray Partridge	10	369	Shawano 7, New Richmond 18, Green Bay 28, Appleton 6, Kickapoo Valley 6, Bridgeport 142, Platteville 25, Poynette 87, Mount Horeb 42, Madison 8
Greater Prairie-Chicken	1	84	Spencer 84
Sharp-tailed Grouse	3	11	Brule 2, Solon Springs 3, Grantsburg 6
Northern Bobwhite	11	238	Trempealeau 9, Wautoma 11, Kickapoo Valley 6, Richland Center 74, Platteville 12, (Baraboo), Poynette 18, Sauk City 72, Mount Horeb 6, Blanchardville 3, Green Lake 19, Beloit 8
American Coot	12	648	Shawano 1, Fremont 1, (Oshkosh), Green Lake 8, Madison 309, Oconomowoc 3, Waukesha 2, Beloit 2, Lake Geneva 310, Plymouth 1, Newburg 6, Milwaukee 4, Racine 1
Sandhill Crane	1	1	Green Lake 1
sandpiper species	1	1	Milwaukee 1
Common Snipe	11	26	Hudson 1, (Wautoma) Adams 5, LaCrosse 1, Kickapoo Valley 1, Richland Center 5, Bridgeport 5, Poynette 3, (Sauk City), Blanchardville 1, Madison 2, Plymouth 1, Newburg 1
Bonaparte's Gull	2	129	Milwaukee 111, Racine 18
Thayer's Gull	1	1	Bayfield 1

(*continued*)

Table 8. (*Continued*)

Species	Number of counts	Number of birds	Count and number
Glaucous Gull	5	5	Bayfield 1, Ashland 1, Fond du Lac 1, Woodland Dunes NE 1, Milwaukee 1
gull spp.	3	1663	Madison 962, Milwaukee 33, Kenosha 668
Snowy Owl	4	6	Ashland 1, Ephraim 1, Green Bay 3, Poynette 1
Northern Hawk Owl	1	1	Brule 1
Long-eared Owl	9	14	Brule 3, Spencer 1, Amery 3, Oshkosh 2, (Stockbridge), Bridgeport 1, Poynette 1, Beloit 1, Newburg 1, Hales Corners 1
Short-eared Owl	6	33	New Richmond 3, Sauk City 1, Mount Horeb 22, Newburg 1, Burlington 5, Racine 1
Northern Saw-whet Owl	1	1	Madison 1
Yellow-bellied Sapsucker	5	7	(Ashland), (Baraboo), Sauk City 1, Madison 1, Oconomowoc 1, Beloit 3, Milwaukee 1
Black-backed Woodpecker	1	1	Brule 1
Gray Jay	7	36	Brule 2, Solon Springs 1, Clam Lake 6, Oxbo 6, Fifield 6, Phelps 8, Three Lake 7
Boreal Chickadee	2	10	Clam Lake 7, Three Lakes 3
Carolina Wren	5	5	Sturgeon Bay 1, Stevens Point 1, Beloit 1, Milwaukee 1, Racine 1
Winter Wren	6	6	Green Bay 1, Bridgeport 1, Poynette 1, Madison 1, Beloit 1, Newburg 1
Eastern Bluebird	2	15	Green Bay 10, Baraboo 5
Hermit Thrush	1	1	Milwaukee 1
Varied Thrush	2	2	Bayfield 1, Milwaukee 1
Gray Catbird	1	1	Woodland Dunes SE 1
Brown Thrasher	2	2	Oxbo 1, (Stevens Point), Sauk City 1
Bohemian Waxwing	3	91	Bayfield 81, Ashland 7, Grantsburg 3
Yellow-rumped Warbler	1	1	Burlington 1
Pine Warbler	1	1	LaCrosse 1
Rufous-sided Towhee	3	4	Richland Center 2, Madison 1, Oconomowoc 1
Field Sparrow	3	5	Trempealeau 1, Platteville 2, Baraboo 2, (Milwaukee)
Fox Sparrow	7	7	Fifield 1, Ephraim 1, Poynette 1, Sauk City 1, (Mount Horeb), (Green Lake), Madison 1, Milwaukee 1, Racine 1
Swamp Sparrow	8	34	Poynette 3, Sauk City 1, Madison 16, Waukesha 2, Newburg 8, Hales Corners 2, Racine 1, Kenosha 1
White-throated Sparrow	13	29	(Ashland), (Pensaukee), Chippewa Falls 2, Green Bay 2, Appleton 1, Oshkosh 2, Platteville 1, Sauk City 1, Mount Horeb 2, Madison 5, Waukesha 3, Lake Geneva 2, Woodland Dunes NE 1, Milwaukee 6, (Hales Corners), Racine 1
White-crowned Sparrow	6	10	Ashland 1, Bridgeport 2, (Madison), Waukesha 3, Beloit 2, Milwaukee 1, Hales Corners 1
Lapland Longspur	10	130	Shawano 1, Amery 2, New Richmond 2, Willard 12, Shiocton 1, Woodland Dunes NW 1, Oshkosh 42, Poynette 11, Columbus 18, Madison 40
Eastern Meadowlark	2	3	Spencer 2, Pensaukee 1
meadowlark spp.	10	21	Spencer 1, New Richmond 1, Willard 1, Shiocton 1, Oshkosh 9, Richland Center 1, Blanchardville 3, Randolph 1, Columbus 2, Hartford 1
Rusty Blackbird	6	45	New Richmond 1, (Owen), Durand 1, Bridgeport 38, Baraboo 1, Madison 2, Newburg 2
Brewer's Blackbird	1	4	(Oshkosh), Waukesha 4
Brown-headed Cowbird	7	352	Willard 1, Fremont 2, Oshkosh 3, Richland Center 2, Madison 340, Hartford 2, (Milwaukee), Hales Corners 2
Northern Oriole	1	1	Peshtigo 1
Red Crossbill	9	83	Bayfield 4, Solon Springs 2, Fifield 25, Phelps 10, Stevens Point 16, Fond du Lac 5, Waukesha 1, Woodland Dunes NE 15, Plymouth 5

was about average. Carolina Wrens, which were extirpated from Wisconsin and Illinois by severe weather in January 1977, have continued to make a comeback; the five that were reported was the highest total since 1975. Only one Yellow-rumped Warbler was found (at Burlington); the Pine Warbler at LaCrosse was a highlight.

Thrushes, Shrikes, and Waxwings.— The 15 Eastern Bluebirds (10 at Green Bay, 5 at Baraboo) was an excellent total, but well below last year's incredible record (64). The number of American Robins was somewhat below normal. Varied Thrushes were found on 2 counts, and only one Hermit Thrush was seen. After an exceptional invasion

last year, Bohemian Waxwings were almost absent this year, being found only on 3 northern counts. Cedar Waxwings, however, were seen in well above normal numbers. It was also a good year for Northern Shrikes, which were especially common in the northern half of the state.

Sparrows.—Numbers of American Tree Sparrows and Dark-eyed Juncos were somewhat below normal, and most of the less common sparrows occurred in about average numbers. Exceptions were White-throated and White-crowned Sparrows. The count of White-throated Sparrows was the lowest since 1971. On the other hand, an above average number of White-crowned Sparrows was seen on a record number of counts (6).

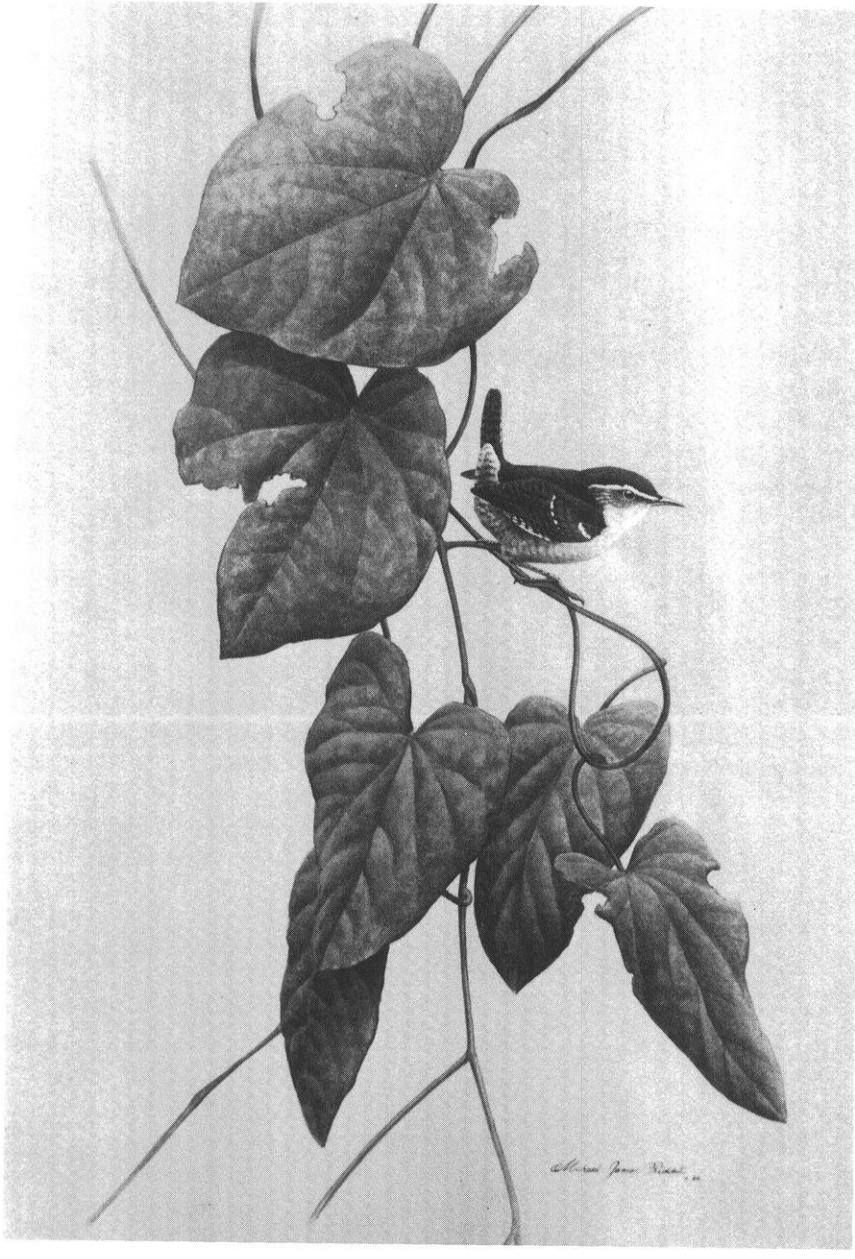
Open Country Birds.—With a good snow cover to force these species to roadsides, it should have been a good year to observe them, but only Horned Larks and meadowlarks were found in above normal numbers. Snow Buntings and Lapland Longspurs were somewhat less abundant than usual.

Blackbirds.—Common Grackles were seen in a record number, thanks to large totals at Mount Horeb, Madison, and Beloit. Totals of Brown-headed Cowbirds and Rusty Blackbirds were also well above normal, while the count of Red-winged Blackbirds was well below average.

Finches.—After a tremendous invasion in 1989, the southward flight of winter finches in 1990 was dismal. No White-winged Crossbills were seen for the first time since 1970. Numbers of Common Redpolls were 92% below the average for the last 10 years, Pine Siskins were 83% below, Evening Grosbeaks 68% below, Pine Grosbeaks 46% below, and Purple Finches 32% below the 10-year average. On the positive side, the number of American Goldfinches was slightly above normal and Red Crossbills occurred in about average numbers. Populations of House Finches continued to burgeon as this species spreads throughout the state.

The 1990 Wisconsin Christmas Bird Counts produced excellent counts of many water related birds and above normal numbers of several other species, but overall they were average at best. Hopefully the 1991 counts will be blessed with better weather and more birds. If you wish to participate in a count in 1991, please contact the compiler in your area. If you wish to initiate a new count in an area not presently covered, please write to me.

William Hilsenhoff
Department of Entomology
University of Wisconsin
Madison, WI 53706



Carolina Wren *by Michael James Riddet* (Reprinted with the permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

1990: A Memorable Year of Birding in Wisconsin

During 1990 Daryl Tessen tallied 308 species on his Wisconsin bird list, topping his previous record of 305 in 1987. Details of this accomplishment are provided.

by Daryl D. Tessen

For those who keep an annual list of species seen in Wisconsin, tallying over 300 species is a special accomplishment. In trying for such a list there are several factors affecting your success. First, considerable time and miles will be involved in chasing the rarities. Second, the year must consist of excellent spring and fall migrations, plus an abnormal number of rarities appearing throughout the year. If there are many lulls in the accumulation of new species, attaining a list of over 300 is virtually impossible. Third, you need the help of friends and the W.S.O. "hotline" to keep informed of the latest sightings. Last, you need a large measure of luck that it will be a good year and that the bird you have driven across the state to see will still be present. Be prepared for those long drives home after missing a species; there will always be several of them during the year.

Two approaches are possible when attempting to tally a big annual list. First, after you have decided in advance to attempt a big list during the upcoming year, careful planning is necessary to cover all the major areas of the state during the appropriate seasons; ask friends for assistance and then hope it is not an unusually quiet year.

The other strategy involves gauging your progress at certain key times of year to see if reaching your goal is practical. Several years ago Randy Hoffman and I developed a way to predict your chances of success. We found that if your list is over 280 by June 1 the chance of surpassing the 300 mark is about 75%. For the duration of the year you will need to continually pick up rarities, plus fill in any previously missed species. To my knowledge the 300 mark has only been reached four times in Wisconsin. Randy Hoffman had 301 in 1981, while I had 300 in 1982, 305 in 1987, and now 308 in 1990. In all four instances, our lists exceeded 280 by late May or early June. We both felt that a list of 310–315 species was possible in each of these years.

1990 commenced as a typical bird-

ing year for me. Several excellent finds were recorded, but the number tallied during the January–March period was not exceptional. Among the more enjoyable sightings during January were the twelve Short-eared Owls at Bong Recreational Area, the Harlequin Duck and Carolina Wren in Madison, the Townsend's Solitaire in Lodi, and the Mew Gull in Milwaukee. February and early March produced several sightings of Thayer's Gull, Iceland Gull, and Glaucous Gull along Lake Michigan and at Oshkosh, a wintering Harris' Sparrow at Don & Judy Haseleu's feeder, and a Varied Thrush at a feeder west of Shawano. Then, activity quickened in late March with a good waterfowl migration that included a Trumpeter Swan at Stoughton on the 17th, a Ross' Goose—a life bird—at Goose Pond, a Greater White-fronted Goose on the 24th, and a Eurasian Wigeon, located after considerable searching, on a W.S.O. field trip to the Arlington Ponds on the 31st.

The pace continued to quicken during April, especially during the last weekend. The month commenced with Red-throated Loons near Cleveland. A mid-month trip to Hiles-Three Lakes-Eagle River yielded a Golden Eagle, Spruce Grouse, Gray Jay, and Boreal Chickadee, the latter three at the "A" bog. However, the highlight of the month occurred on Easter Sunday while returning to Illinois. A stop at a bluff north of Cleveland revealed two loons, one a Red-throated Loon and the other a Pacific Loon in partially breeding plumage! For almost an hour I watched it swimming northward, occasionally diving and preening. The unusually warm weather in late April brought a flood of May migrants into the state. A birding trip on the 28th to southern locales produced 123 species, and a trip on the 29th to eastern areas yielded 110 species. The combined list was 146 and included a White-faced Ibis at Theresa Marsh, a Peregrine Falcon chasing yellowlegs at Storrs Lake Wildlife Area, 13 shorebird species (including 230 Lesser Golden Plovers in Rock County and seven American Avocets on Lake Michigan), three vireo species, and an impressive 17 warbler species (including a Worm-eating Warbler at Natureland Park, and a Hooded Warbler at Esterbrook Park).

Cold and snow in early May and heavy rains during mid-month slowed the migration considerably. The only break occurred on the 17th when, scouting for a planned Big Day Count with Jim Frank, 177 species were found. Highlights of the day were a Cattle Egret at Horicon Marsh, Black Scoters and White-winged Scoters near Cleveland, and a Summer Tanager in a fine passerine migration in Rock County. However, the really exciting part of the month occurred during the Memorial Day weekend. A three-day trip (26th-28th) covering the Sugar River—Avon area, Yellowstone Lake State Park, Baxter's Hollow, Solon Springs, Wisconsin Point, Ashland, Stone's Bridge, Crex Meadows and Fish Lake Wildlife Areas, Oakridge Lake, Wilson, and the Arlington Ponds totalled 208 species. Noteworthy were Yellow-breasted Chat, Lark Sparrow, Orchard Oriole and Dickcissels in southern Rock County; Yellow-crowned Night-Heron, Yellow-throated Warbler and Prothonotary Warbler at Sugar River; White-eyed Vireo at Yellowstone Lake State Park; Bell's Vireo near Mazomanie; Western Kingbird west of Sauk City; American

White Pelican at Wisconsin Point; American Avocet and Western Sandpiper near Ashland; Black-backed Woodpecker at Stone's Bridge; Eared Grebes, Sharp-tailed Grouse, Yellow Rail, LeConte's Sparrow and Sharp-tailed Sparrow at Crex Meadows; and Hudsonian Godwit and Red-necked Phalarope at Wilson's Pond (near Menominee). Additional wildlife sightings included a coyote in southern Rock County (watching me while I observed the Yellow-breasted Chat), a skunk and porcupine on the way to Crex Meadows, and four otters and a beaver at Crex Meadows.

With my year's list at 287 by the beginning of June, I decided to make an effort to surpass the 305 mark. However, plans had been made for a three-week vacation to Yellowstone and the Tetons, so birding would be limited until mid–July. When another teaching year ended on June 8, I hurried toward Appleton to run three Breeding Bird Survey routes before leaving for Wyoming. Enroute, a brief stop at Manitowoc produced Franklin's Gull (#288) and Little Gull (#289), while at the Barkhausen Preserve near Green Bay I found a Snowy Egret (#290). Expecting nothing more, I was surprised on the Oconto Falls count when a Swainson's Hawk (#291) soared over one of the stops. When returning from Wyoming, I saw a Loggerhead Shrike (#292) in western Winnebago County.

July produced an additional four species. On the 9th while returning to Elgin I paused to check the Coast Guard Impoundment for a Laughing Gull listed on the hotline. Initial scanning revealed two Franklin's Gulls but no Laughing Gull. However, a few minutes later it was found on the southeast corner of the impoundment, shortly joined by three Franklin's. During late July, a check of the hotline revealed nesting Western Grebes at Rush Lake, a first for the state. On July 26 I left home so as to arrive there shortly after dawn. During the ensuing two hours four grebe species were found including two Eared Grebes, 15 Red-necked Grebes, and the Western Grebe. An immature Little Blue Heron was a surprise discovered along the shore at the same time. July closed with a Long-billed Dowitcher (#296) at Kaukauna.

Realizing the best chance for additions to the list in August were previously missed shorebirds, an emphasis was made to check shorebird habitat. Complicating this plan was a sudden decision for a short return trip to Wyoming during early August. Before I left, the hotline indicated a good shorebird area northeast of Ripon. Checking it out proved disappointing, as it was almost dry. However, sod farms south of Rush Lake were nearby, and a quick detour there revealed several shorebird species, including a Buff-breasted Sandpiper (#297).

The Wyoming vacation was memorable for a grizzly sow and her three cubs feeding at dusk on a Yellowstone meadow while coyotes howled, buffalo roaming nearby, Canada Geese and Sandhill Cranes calling from the adjacent river, a pine marten chasing red squirrels by the cabin one morning, a pika harvesting grass for the winter, and a long-tailed weasel dashing across a hiking trail in pursuit of prey.

Back in Wisconsin, the quest resumed. As another teaching year was about to begin, I returned to Elgin on August 27 via Green Bay, Manitowoc, Sheboygan and Milwaukee in hopes of adding shorebirds. At Two Rivers/

Manitowoc, it was surprisingly foggy. While scanning the gulls on the beach south of Two Rivers a large shorebird with a decurved bill suddenly emerged from the fog—a Whimbrel; I was up to 298. At Sheboygan the standard fare of shorebirds and gulls was present. However, a recheck before leaving revealed a Red Knot (#299) that was feeding on the algae covered rocks.

What species would be the 300th on my list? It came September 22, on a W.S.O. field trip to Harrington Beach State Park. In addition to seeing an American Avocet, there was a fine passerine and hawk movement along the lake. Raptors included 2 Peregrine Falcons, 5 Ospreys, 1 Bald Eagle, 24 Sharp-shinned Hawks, 2 Cooper's Hawks, 1 Broad-winged Hawks, and 5 *Merlins*—#300. There was hardly time to savor this 300th species when Robbye Johnson called to inform me of an immature Parasitic Jaeger frequenting Wisconsin Point. Leaving Friday night, I had an all night drive to Superior. However, upon reaching Solon Spring I realized I would arrive too early so I made a detour to the Highway "A" bog, where a Great Gray Owl had been found during the summer. After a short rest at the Pioneer Road-Highway "A" junction, light was beginning to show in the eastern sky. As I exited my car, I was surprised to hear deep hoots coming from the adjacent woods. Hardly believing my good fortune, I listened to the Great Gray Owl call for a short period of time. Number 301 was truly unexpected. As I prepared to leave, a Black-backed Woodpecker was discovered working nearby trees, and further north along Highway "A" a Pileated Woodpecker and Gray Jay were found, with coyotes calling in the distance and possibly three wolves near the road. As I approached Wisconsin Point, moderate showers were encountered. Anyone who has birded here knows inclement weather can be the best time for rarities. As I arrived a squall line developed offshore to the northeast, and the showers temporarily subsiding. Waterfowl were moving along the lake, including all three scoter species; a few shorebirds were arriving in the bay, and two American Pipits landed on the beach in front of me. However, initial scans revealed no jaeger, but I kept reminding myself that patience is a prerequisite. On one of the succeeding searches, a dark jaeger was discovered harassing gulls over the lake. As it wheeled back and forth it proved to be species #302, the Parasitic Jaeger. Wishing to enjoy it fully, I returned to the car to obtain my scope. Upon returning, I was disappointed in not being able to relocate it, but instead a large gull came into view as it flew low over the water. This too was a jaeger, but not the Parasitic. During the next several minutes it alternated between a low flight over the water and rising to harass gulls, affording views that identified it as a Pomarine Jaeger—a life bird and species #303. Eventually, it was lost in the distance over the lake. About now I remembered the squall line and the increasing rainfall—amazing how one forgets bad weather while enjoying good birds. Descending from the clouds was a water spout, eventually reaching the water. After several minutes it retracted but reappeared later for a few minutes. From late morning until mid-afternoon Robbye and I watched migrating Canada Geese flocks crossing the lake, plus a Peregrine Falcon harassing gulls and ducks off the Point. The long ride back to

Elgin that night seemed shorter while recalling the pleasant memories of the day.

October was abnormally quiet. The only exception occurred on the 13th while I watched all three scoter species at Harrington Beach State Park. An immature Great Black-backed Gull (#304) flew in from the lake, chasing several Herring Gulls and Ring-billed Gulls before continuing north. I was now only one away from equalling my 1985 record. Unfortunately, the remainder of October and most of November continued exceptionally quiet—the dreaded lull that plagues birding.

The major break occurred Thanksgiving weekend and continued at a dizzying pace for the next two weeks. Returning from Appleton on November 25, I chanced to stop at Sheboygan. While watching various ducks and gulls near Sheboygan Point, I caught a glimpse of a shorebird as it moved behind the rocks. Purple Sandpiper crossed my mind, but the look was too brief for identification. The bird proved unusually wary of adjacent gulls as it stayed behind the rocks, only occasionally showing its head. Not wanting to chance scaring it, I waited for what seemed an eternity. Finally it emerged—a short, stocky, dark shorebird with yellow/orange legs and a decurved bill that had a yellow base. It was a Purple Sandpiper and the record tying 305th species! For the next half hour it fed amongst the algae covered rocks, while I savored the moment.

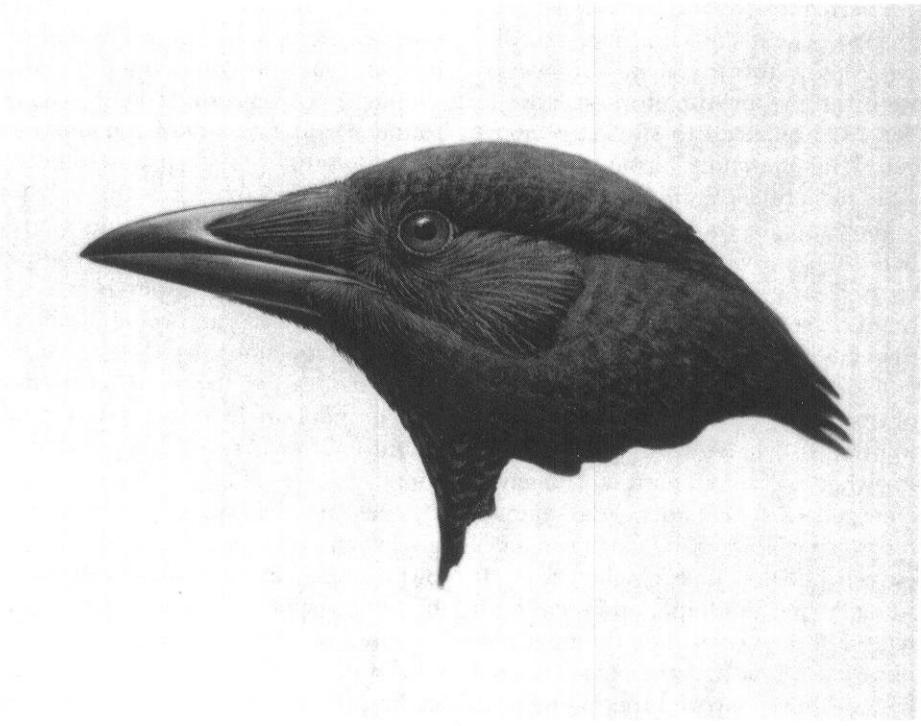
What species would be the record breaker? The only easy species left was the Snowy Owl that had been missed last winter. However, two real surprises awaited me. First Mary Donald called November 28 to inform me of an Anna's Hummingbird coming to a feeder in Wales. Almost December and here in Wisconsin was a bird characteristic of the west coast. December 1 found me at David & Susan Schmidt's residence. An anxious fifteen minutes later and suddenly, less than ten feet from the window, there was a brilliantly colored male Anna's Hummingbird at the feeder. Here was number 306, plus an addition to my state list. It appeared several more times before I thanked the Schmidts and left.

The second surprise occurred early the following week when Larry Semo called to inform me of a Northern Hawk-Owl he had seen that morning south of Superior. Apparently it had been present since mid–November, but word had not gotten out until now. Would I be interested? Friday night found me in Eau Claire (no 24-hour run this time). As sleep was difficult, dawn found me arriving at the C.T.H.s "A" and "B" junction where Larry and Robbye were waiting. Also waiting was the hawk owl as it perched along "B"—number 307 and yet another addition to my state list. For the next hour several of us, including Dick Verch and Dan Belter, enjoyed views of the owl as it sat waiting for prey. Finally hunger conquered most of us. Besides, at the Perkins Restaurant was a "promised" Snowy Owl. While no owl was present when we arrived, after breakfast species #308 was spotted perched on the ice. While the Snowy Owl was not as glamorous as the preceding three species, it was nevertheless enjoyed just as much. A return visit for another view of the hawk owl primed me for the seven-hour return trip. As in September, the drive seemed short due to the success of the day. The remainder of the month

yielded no new possibilities, as winter weather with ice, snow and cold predominated.

An obvious concluding question is: What species were missed that should not have been? Due either to unsuccessful attempts or not trying at all, my list did not include Cinnamon Teal, Marbled Godwit, Lesser Black-backed Gull, Chuck-will's-widow, Northern Mockingbird, Mountain Bluebird, Hoary Redpoll, and Eurasian Tree Sparrow. Had all eight been found my year's total would have been 316. However, each year there will be a combination of misses and luck, such as 1990's Pacific Loon, Pomarine Jaeger and Great Gray Owl. Can a list of 320–325 be attained? With the right combination of rarities and good migratory movements during a year, the answer is definitely yes! Why not try for it? Maybe you will be fortunate enough to have that fun-filled, memorable, albeit tiring year that sets the new standard.

Daryl D. Tessen
2 Pioneer Park Place
Elgin, IL 60123



American Crow *by Michael James Riddet* (Reprinted with the permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

Wisconsin's First Anna's Hummingbird

In November 1990 an Anna's Hummingbird was discovered in Wisconsin, a new addition to the state bird list. Details of its discovery and subsequent rescue are provided here.

by Barbara Kranich

My husband, Lee, and I had just fixed lunch for ourselves when a call came from Bob Adams. He was sitting by a big picture window at a home in Wales, Wisconsin, watching what he swore was an Anna's Hummingbird (*Calypte anna*). It was a mild day for late November--38°—but much too late in the year for hummingbirds. Besides we *knew* that only Ruby-throated Hummingbirds were found east of the Mississippi River! But Bob was a birder with over half a century of experience and not likely to make a mistake identifying a bird.

"Get over here right away, with your camera!" Bob said. "We need a good picture to document this bird!"

Within 15 minutes we loaded camera bags, binoculars, and field guides into our van and were speeding to the David Schmidt house, a 20-minute drive from our home. Upon arrival, Susan Schmidt led us to the dining room which overlooked the bird feeders hanging throughout their backyard. Bob and his friend, Wilbur Riemer, pointed out a tiny nondescript wisp of greenish feathers perched low in a tree about 25 yards away, barely visible through our 7×20's. Suddenly the bird darted toward the feeder some 12 feet in front of the window from where we watched. He made a few feints at the feeder, then hovered over it and began to feed. Several times he backed up a few inches, then reattacked the tiny hole in the plastic flower to sip the sweet water. Transfixed, we saw the incredible iridescent rose-red feathers that covered the throat and extended over the forehead and crown. His bib was white, his belly, back, wings, and tail were green. He looked like he had flown off of page 187 of our field guide, *Birds of North America*. We watched his brilliant red throat and head blacken as he flew to the shady side of the feeder, then light up like a neon sign as he backed away into the sunlight.

During the next three hours, as Lee set up the camera equipment and took pictures (Figure 1), Susan told us the story of how the Anna's Hummingbird appeared one day in late August and had stayed to enjoy the bounty of their backyard and flower garden, especially the sugar water that Susan kept to attract ruby-throats.

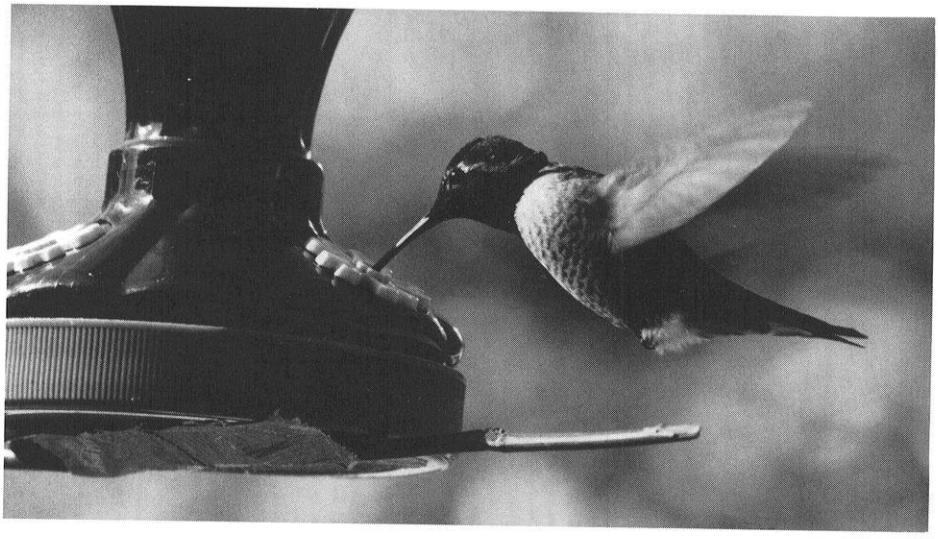


Figure 1. Wisconsin's first Anna's Hummingbird, photographed in Wales, Wisconsin, 28 November 1990 (*photo by Lee Kranich*).

"We thought he was just an odd looking ruby-throat," she explained. "We knew he looked like an Anna's, but couldn't be, since they were a western bird, and only ruby-throats were seen around here."

When the hummer didn't leave by October they became concerned, and finally, as the temperature dropped lower and lower, they called a nature center for advice. They were told to take the feeder down. So they did. Susan watched as the hummer searched in vain for the red feeder. As the day progressed the bird became so weak, that he lay listlessly in the nearby grass. Frantic, Sue hurriedly hung the feeder back up. Within a short time, as the hummer fed repeatedly, he regained his strength. But still he didn't migrate. Finally another call to the nature center resulted in a message relayed to Bob Adams who immediately drove over to the Schmidts', identified the bird, and called Lee. It was now November 29th.

The next day was Friday, and Dave Schmidt, a middle school teacher, and the five Schmidt children had all stayed home from school to become involved in what they now realized was an important event. Via Bob and Lee, word of the unique visitor had spread throughout the birders of Milwaukee and Waukesha counties, even as far west as the Madison area. By 8:30 A.M. the next morning eager birders were arriving at the Schmidts' house. By Friday night the news had hit the hotlines. Birders came from Illinois, Indiana, Minnesota, and all over Wisconsin.

Prompted by the Schmidts' deep concern for "their" hummer, we now all realized that the chances for this bird surviving a Wisconsin winter were close to nil. By Saturday Lee had begun calling other birders for their input. Letting "nature take its course," was unthinkable to the five Schmidt children, and a lot of adults agreed that something had to be done. Finally,

in a phone conversation with Noel Cutright, the solution came. Noel's wife, Kate Redmond, who was listening to Noel's side of the conversation suggested, "See if the Horticultural Domes in Milwaukee will take it. Better save the bird while you can than to leave it for someone's life list."

Lee hung up and placed another call, to Richard Risch, Administrator of the Milwaukee Domes. Mr. Risch was very enthusiastic and would be happy to accept the bird. He immediately began updating his information on the care and feeding of hummingbirds.

For three days Lee talked to banders and ornithologists throughout our area. Some were afraid the bird might die of shock or be injured if caught in a mist net. We didn't' know where his night roost was, so we couldn't catch him in a torpid state, as some suggested.

At last, on Sunday evening, Lee was able to reach a bander who agreed to try to catch the bird. But time was running out. Although for two days the sunny weather had reached nearly 50°, warm enough to bring out insects for him to eat, a heavy snow was expected Sunday night. Worried, we went to bed to spend a mostly sleepless night listening to the near blizzard that raged outside. At 5 A.M. we arose, dressed warmly and eased our van out into mostly unplowed roads, with wind driven snow making almost a white-out of the visibility. Twelve inches of snow was predicted, and much of it had fallen. By 6:30 A.M. we were at the Schmidts'. Pat Heiden, the bander, arrived shortly after. Schools and businesses were closed and meetings were canceled, but three silly birders had struggled through the dark, snow-covered roads to try to rescue a bird that never should have been here in the first place.

Anxiously we awaited first light. Had the Anna's survived the night? As we watched, the bird came out of nowhere and went immediately to the feeder, behaving as though the blizzard was no more a problem than a summer shower.

Before any attempts to capture the bird, we needed permission from the U.S. Fish and Wildlife Service to transport the hummer. We watched the bird and the clock until 8 A.M., opening time. Lee called Madison. No answer. One should not presume anything in a snow storm. Madison had even more snow than we did, and nothing was open.

Hopefully, Lee called the U.S. Fish and Wildlife Service in the Twin Cities and reached a sympathetic ear. After assessing the situation, the law enforcement official gave Lee verbal permission to take the bird to the Domes. "In fact," she added, "Give me a call and let me know how the operation went."

Now we were armed with everything we needed—except the bird. For the next hour and a half Pat, Dave, and Lee positioned and repositioned two mist nets in an attempt to capture this sturdy little hummer. With rather obvious scorn, the Anna's would fly back and forth just in front of the nets, until seeing a clear route, he would buzz briskly over, around, or wherever he needed to go to reach the feeder. He would even perch on top of the nets. The trio of bird catchers slipping in the snow, trying to arrange 30 foot nets in a high wind, were fast being bested by a 3½ inch bird. Eventually, after draping one of the nets in a canopy fashion,

the three stalwarts came inside and watched until the hummer returned. Yelling "CHARGE," or something close to it, they rushed out of the house, startling the hummer into the net canopy. Unfortunately, the hummer was too too high in the net canopy for Pat to reach, so Dave lifted her up and she gently grasped the little bird. She slipped him into a small cloth bag and secured the opening. *Voilà!*, we had the bird.

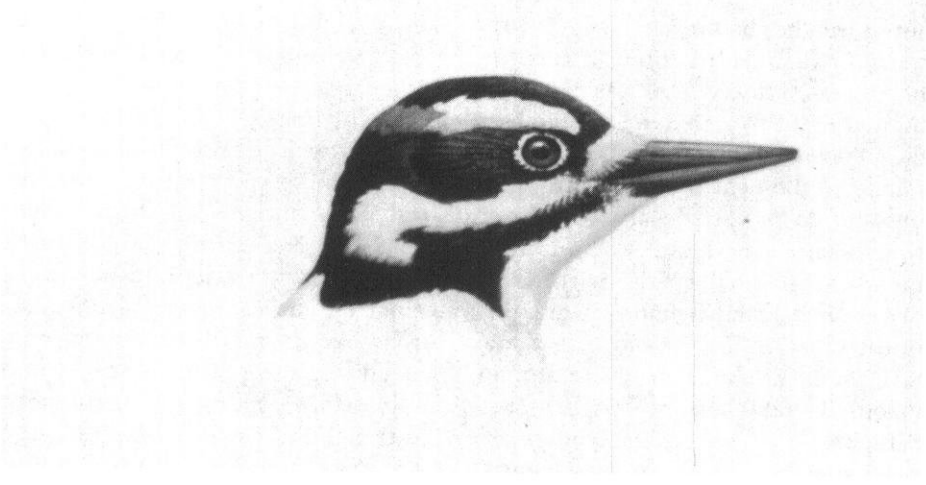
Sue Schmidt phoned the Domes as we prepared to leave. Minutes later Lee and I were carefully negotiating the 30 odd miles to the Domes on roads that were worse than ever. But at least now it was light out. Afraid the hummer would get too warm, we refrained from using the heater.

It took nearly an hour to make the trip. I cradled the sack in my lap and talked to him softly whenever a few minutes elapsed without feeling him flutter. We really did not know if he would survive considering all he had been through.

Arriving at the Domes, we were escorted to the tropical room where the warm temperature and abundance of flowers and insects would (we hoped) remind the Anna's of its natural habitat in California. First we released him into a small cage for monitoring, but we soon realized that not only had he survived the trip, he was energetically trying to escape the cage. We opened the cage door and watched this little hummer escape joyfully into this tropical environment that now was to be his home. That was over a month ago. So far he seems to have adapted well to his limited but bountiful surroundings, is feeding on flowers, insects, and is red feeder.

One question still remains. How and when did a non-migrating bird usually found west of the Rocky Mountains, find its way to Wisconsin?

Barbara Kranich
532 Lookout Drive
Pewaukee, WI 53072



Hairy Woodpecker *by Michael James Riddet* (Reprinted with permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

Wisconsin's First Nesting Record of Western Grebe

In 1990 the first recorded nesting of Western Grebes took place on Rush Lake. The details of this nesting are provided and the natural history of the species in Wisconsin is reviewed.

by Thomas J. Ziebell

The normal breeding range of the Western Grebe (*Aechmophorus occidentalis*) extends from Canada's Prairie Provinces south to southern California and New Mexico (Figure 1). The Western Grebe is also found locally in Mexico from Chihuahua and Durango south to northern Guerrero, Puebla and San Luis Potose (American Ornithologists' Union 1983). On June 25, 1990, Western Grebes were found nesting on Rush Lake, Winnebago County, Wisconsin, roughly 300 miles east of their normal breeding range (Figure 1). This is the first documented nesting of the Western Grebe in Wisconsin.

Rush Lake is a shallow, prairie-pothole wetland located in the southwestern corner of Winnebago County and the northwestern corner of Fond du Lac County, Wisconsin. It has an area of 1245 hectares and an average depth of only 60 cm. The lake is sparsely covered with hardstem bulrush (*Scirpus acutus*) and scattered islands of cattail (*Typha latifolia* and *T. angustifolia*). Emergent vegetation covers only about 25% of the lake's surface.

On May 25, 1990, two Western Grebes were observed on Rush Lake. The birds appeared to favor an area of hardstem bulrush and were very vocal. I suspected that the grebes might attempt to nest. On June 25, 1990, a single bird and a pair of grebes were observed just outside the suspected bulrush. A search of the bulrush revealed two Western Grebe nests. The two nests were about 40 meters apart. Both nests were within the stand of bulrush, not along its edge. Nest #1 was seven meters from open water, and nest #2 was about 11 meters from open water. Small openings or channels in the bulrush were adjacent to the nests. Both nests were within five meters of small Forster's Tern (*Sterna forsteri*) colonies (8–12 nests). Nests of Red-necked Grebes (*Podiceps grisegena*) were noticeably absent from this stand of bulrush, however, several Pied-billed Grebe (*Podilymbus podiceps*) nests were found.

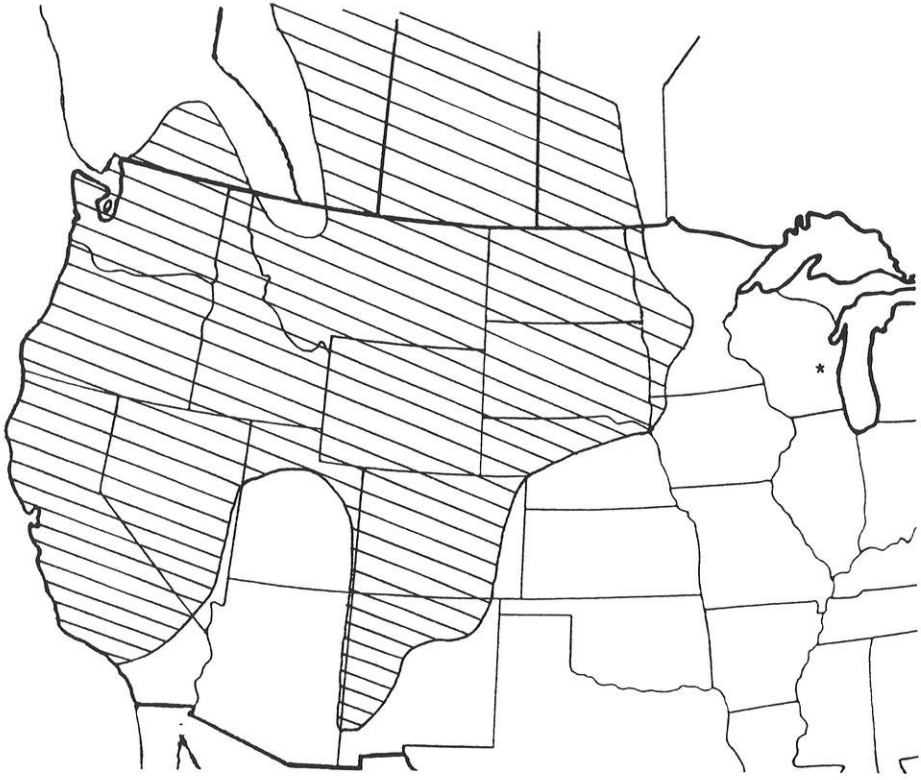


Figure 1. Breeding range of the Western Grebe and the location of Rush Lake (*).

Both Western Grebe nests were floating platforms of bulrush with surrounding bulrush stems pulled down and incorporated into the nest base. The nests were topped with submergent plants which formed a crude nest bowl (Figure 2). On June 25, nest #1 had a diameter of 52 cm and nest #2 had a diameter of 50 cm. The nest bowl in the center of the nests measured 22 by 18 cm in nest #1 and 20 by 16 cm in nest #2. By July, the bulrush base and nest bowl in both nests were no longer distinguishable (Figure 3). On July 10, nest #1 had a diameter of 21 cm and nest #2 had a diameter of 17 cm. On June 25, the water depth at nest #1 was 94 cm and at nest #2 it was 93 cm. On June 25 the water level of the lake was about 20 cm higher than normal due to 3.67 inches of rain that fell on June 22. By July 14 the water level had receded, and the water depth at nest #1 was 71 cm and at nest #2 it was 70 cm.

When found on June 25, nest #1 had four eggs, and nest #2 had two. No other eggs were added, and these clutches were considered complete. Egg length ranged from 54.0 mm to 60.0 mm with a mean of 57.75 mm (SD = 4.57). Egg breadth ranged from 36.0 mm to 38.2 mm with a mean of 37.33 mm (SD = 0.52). The adults were quite secretive around the nests. On several of the early visits not a sin-

Figure 2. Rush Lake Western Grebe nest, June 25, 1990.

gle adult was seen in or around the stand or bulrush. However, each time the nests were checked the eggs were found to be warm and uncovered. On one occasion nest #1 had some nest material covering two eggs. On most visits adults were not seen sitting on the nests. However, occasionally an adult was seen just before it slipped off the nest and disappeared into the water. I soon learned that when I was at the nest the adults would surface and remain hidden in the bulrush four to six meters away from me. Once their favorite surfacing spots were known, I could always see a white neck appear, move about, and disappear in the bulrush.

Since the nests were found with completed clutches, the incubation period could not be determined. Using 24 days as the average incubation period (Lindvall and Low 1982) and counting back from the days the eggs hatched, the onset of egg laying is estimated to be around June 13 in nest #1 and June 21 in nest #2. The eggs hatched from July 6 to 8 in nest #1 and on July 14 and 15 in nest #2. The eggs in both nests hatched asynchronously. Both eggs hatched in nest #2. Three eggs are known to have hatched in nest #1. The remains of the fourth egg, found next to nest #1, suggest that it was broken and did not hatch. The cause of the broken egg could not be determined.

Visual confirmation of young did not occur until July 19, when two young were seen on the back of an adult from nest #2. As the young grew older and spent less time on their parent's backs, they became much easier to census. The five young were regularly seen with their parents until August 24, when observations were terminated. None of the young were lost to predation. Reproductive success was very high for these two nests. In addition to the nesting pairs, three other pairs of Western Grebes summered on Rush Lake. These three pairs were never observed near the two known nests, but were found in open water feeding and loafing. These pairs were either non-breeders (not mature enough to breed) or had attempted to nest and were unsuccessful. The pairs kept considerable distance between themselves. After July 25 these three

Figure 3. Rush Lake Western Grebe nest, July 10, 1990.

pairs were no longer observed on the lake.

Discussion

In Wisconsin the Western Grebe is considered a rare, but regular visitor (Barger et al. 1988). The majority of sightings in Wisconsin occur during migration. However, since 1980 several sightings during the nesting season (June–July) have been listed in *The Passenger Pigeon*. Three reports come from extreme northwestern Wisconsin in counties bordering Minnesota. Five other reports come from east central Wisconsin: Horicon Marsh (1986), Lake Maria (1989), and Rush Lake (June 11–17, 1982; July 19, 1986; and June 14–28, 1987). These three Rush Lake sightings occurred in the same area where the nests were found in 1990.

Although Rush Lake is well out of the normal breeding range of the Western Grebe, the habitat on the lake appears to be suitable. Rush Lake fits the following criteria, listed by Short (1984), for a wetland to be suitable nesting habitat for the Western Grebe: the wetland is 20 ha (50 acres) or more in area, it has population of small fish, the herbaceous growth is sheltered from wakes of motor boats, the area of herbaceous growth is not greater than 30% of the total wetland area, the herbaceous growth borders open water, and the water is at least 30 cms (12 inches) deep around and through the herbaceous growth. Finley (1907) and Nuechterlein (1975) suggest similar requirements for nesting Western Grebes.

Nests in emergent vegetation (bulrush, cattail, and reeds) are typical of Western Grebes (Davis 1961, Palmer 1962, Herman et al. 1969, Lindvall and Low 1982, Short 1984, and Forbes 1988). The nests on Rush Lake were constructed of bulrush and lined with submergent plants. Forbes (1988) reports nests built of bulrush and lined with submergent vegetation. Lindvall and Low (1982) found that in colonies with ten or fewer nests, nests were spaced an average of 30 meters apart, while colonies larger than ten nests averaged 15 meters or less. Davis (1961) found nests in various colonies spaced 6–50 feet apart (1.8–15.24 meters). The two nests on Rush Lake were about 40 meters apart.

The two Rush Lake nests were 7 and 11 meters from open water. The literature reports nests in open water and up to 30.48 meters (100 feet) from open water (Davis 1961, Lindvall and Low 1982). Bent (1919), Wetmore (1924), Yocum et al. (1958), Davis (1961), and Stirling (1964) suggest that Western Grebes prefer to nest near or on open water. Nuechterlein (1975) and Short (1984) found that a wave break of some sort is frequently located between the nest and open water. The nests on Rush Lake may have been placed further into the bulrush, away from the open water, to provide some protection from wind and wave action. Both nests were within five meters of Forster's tern nests. Nuechterlein (1982) reports that large Western Grebes colonies included nesting Forster's Terns and that the terns would alert the grebes to approaching danger. The terns also provided this service for the grebes on Rush Lake. Palmer (1962) lists nest diameter as being "about 60 cms." Lindvall and Low (1982) report mean nest diameters of

70 cm and 24 cm for nests built of pondweed (*Potamogeton spp.*). Davis (1961) found nests constructed of cattail and bulrush that ranged from 30 to 180 cm (1–6 feet), but were usually 45.72 to 60.96 cm (1.5–2 feet). Forbes (1988) reports nests built of bulrush that were 60 to 120 cm in diameter. The nests on Rush Lake were 52 and 50 cm in diameter on June 25. These are slightly smaller than most of those listed in the literature, but are within the range reported by Davis (1961). Davis (1961) also found that nests in dense cover were smaller than more exposed nests. The Rush Lake nests were found in dense stands of bulrush and this may have contributed to their smaller size. By July 10 the diameters of these two nests were reduced to 21 and 17 cm. I found no reference in the literature of the reduction in the size of Western Grebe nests as incubation progressed.

Water depth at the nest can be up to 10 feet (304.8 cm) (Palmer 1962). Forbes (1988) found nests in 15 to 150 cm of water. Nuechterlein (1975) found an average depth of 41 cm. The maintenance of at least 30 cm (12 inches) of water is critical to nest success (Nuechterlein 1975, Feerer and Garnett 1977, and Short 1984). The water depth at the Rush Lake nests was well above the 30 cm suggested as a minimum. The depths of 94 and 93 cm on June 25 were the result of an extremely high water level. This higher than average level was due to 3.67 inches of rain that fell on June 22. By July 14 the water level was more typical for that time of year and the depths at the nests were 71 and 70 cm. The sudden increase in water level on June 22 apparently had no adverse effect on these floating nests since the nests and some of the eggs were present before the water level rose. Palmer (1962) lists the clutch size for the Western Grebe as 3 to 4. Lindvall and Low (1982) report clutch sizes of 1 to 4 with a mean of 2.6. Forbes (1988) found mean clutch sizes ranging from 2.9 to 3.7. Egg sets in the Richter Museum of Natural History, University of Wisconsin-Green Bay have clutch sizes of 5, 4, 4, and 3 (T. Erdman, unpublished data). The clutch sizes of 4 and 2 found on Rush Lake are typical for Western Grebes. Egg length and breadth measurements recorded for Rush Lake are very similar to those documented by others (Table 1). Western Grebe eggs hatch asynchronously (Palmer 1962, Nuechterlein 1981). The eggs in the nests observed on Rush Lake hatched asynchronously.

Lindvall and Low (1982) report predation of Western Grebe eggs by American Coot (*Fulica americana*) and California Gull (*Larus californicus*). Yocum et al. (1958) found evidence of egg predation by Ring-billed Gulls (*Larus delawarensis*). Although several Herring Gulls (*Larus argentatus*), up to 80 Ring-billed Gulls and several hundred American Coot were on the lake while the grebes were nesting, no egg predation was documented. The presence of nesting Forster's Terns may have helped prevent egg predation. On several occasions Herring and Ring-billed Gulls that were flying over the area were driven away by Forster's Terns.

The remains of the egg found on the side of nest #1, were from one of the last two eggs in the nest. It appears that this egg failed to hatch and the adults took the three hatched young and left the nest. After they had abandoned the nest, something, possibly a predator,

Table 1. Western Grebe egg dimensions.

Source	Number of eggs	Length (mm)			Breadth (mm)		
		Range	Mean	SD	Range	Mean	SD
Palmer (1962)	20	—	58.84	2.16	—	38.33	0.91
T. Erdman (unpublished data)	16	54.56–59.59	57.27	2.66	36.59–39.86	38.30	1.09
This Study	6	54.0–60.0	57.75	4.57	36.0–38.2	37.33	0.52

may have destroyed the egg. The adult grebes were tidy nest keepers, and no egg shells were found from the eggs that did hatch. Lindvall and Low (1982) observed an adult Western Grebe remove a predated egg from its nest and deposit it several meters from the nest. If the egg in nest #1 had been destroyed when the adults were still using the nest, most likely the remains would have been taken away by the parents. Since the remains were not removed, it appears that the grebes had abandoned the nest before the egg was broken or predated, suggesting that the egg did not hatch.

Knapton (1988) found considerable predation of Western Grebe young by Herring and California Gulls. On Rush Lake no young were lost to predation. All five young were almost adult size when last observed on August 25.

The Western Grebes on Rush Lake had exceptional reproductive success. Lindvall and Low (1982) classify Western Grebes as adults, class 1 young (on parents back), class 2 young (free-swimming downy young), or class 3 young (showing black on the head and neck, resemble adults). Using this classification, several indices to reproductive success were calculated. The Rush Lake grebes produced an average of 0.5 lass 2 young per adult. This is higher than 0.35 class 2 young per adult reported by Lindvall and Low (1982). Rudd and Herman (1972) found 1.7 class 2 young per mated pair in what they considered a normally reproducing population. Lindvall and Low (1982) also report an average class 2 brood size per mated pair of 1.7. On Rush Lake the average class 2 brood size per mated pair was 2.5, well above the 1.7 reported by others. Forbes (1988) found an average of 0.79 class 3 young produced per adult. On Rush Lake 1.25 class 3 young were produced per adult.

The presence of the three pairs of non-breeding Western Grebes on Rush Lake is not unusual. Ydenberg and Forbes (1988) reported that 50 non-breeding Western Grebes shared the same lake with 180 breeding grebes.

Conclusion

The nesting of Western Grebes on Rush Lake is the first documented record for Wisconsin. The breeding biology of Western Grebes on Rush Lake is very similar to that recorded for the species in its normal breeding range. However, the nesting success of the Rush Lake Western Grebes was higher than that documented for Western Grebes in their normal breeding range. I hope Western Grebes will return to Rush Lake to nest and continue to be a part of Wisconsin's nesting avifauna.

Acknowledgements

I would like to thank Tom Erdman for the use of unpublished data from the Western Grebe egg sets in the Richter Museum of Natural History, University of Wisconsin-Green Bay. I would also like to thank Anita Carpenter and Charleen Ziebell for reviewing the manuscript.

Literature Cited

American Ornithologists' Union. 1983. *Checklist of North American Birds*. 6th edition. 877pp.

Barger, N. R., S. D. Robbins, Jr., and S. A. Temple. 1988. *Wisconsin Birds— A Checklist With Migration Graphs*. Wisconsin Society for Ornithology, Hartland, WI.

Bent, A. C. 1919. *Life histories of North American diving birds*. U.S. National Museum Bulletin 107.

Davis, D. G. 1961. Western Grebe colonies in northern Colorado. *Condor* 63:265–266.

Feerer, J. L., and R. L. Garrett. 1977. Potential western grebe extinction on California lakes. *Cal.-Neva. Wildlife Transactions* 80–89.

Finley, W. L. 1907. The grebes of southern Oregon. *Condor* 9:97–101. Forbes, L. S. 1988. Western Grebe nesting in British Columbia. *Murrelet* 69:28–33.

Herman, S. G., R. L. Garrett, and R. L. Rudd. 1969. Pesticides and the western grebe. P. 24–53. *In* M. W. Miller and G. B. Berg (eds.). *Chemical Fallout*. C. C. Thomas Publ., Springfield, Il.

Knapton, R. W. 1988. Predation of Western Grebe chicks by Herring and California gulls. *Blue Jay* 46:36–37.

Lindvall, M. L., and J. B. Low. 1982. Nesting ecology and production of Western Grebes at Bear River Migratory Bird Refuge, Utah. *Condor* 84:66–70.

Nuechterlein, G. L. 1975. Nesting ecology of western grebes on the Delta Marsh, Manitoba. M.S. Thesis. Colorado State University, Fort Collins. 105pp.

Nuechterlein, G. L. 1981. Asynchronous hatching and sibling competition in Western Grebes. *Canadian Journal of Zoology* 59:994–998.

Nuechterlein, G. L. 1982. Western Grebes, the birds that walk on water. *National Geographic Magazine* 161:624–636.

Palmer, R. S. (ed.). 1962. *Handbook of North American Birds* Vol. 1. Yale Univ. Press, New Haven, CT.

Rudd, R. L., and S. G. Herman. 1972. Ecosystem transferal of pesticide residues in an aquatic environment. P. 471–485. *In* F. Matsumura, G. Bonsh, and T. Misato (eds.). *Toxic effect of pesticide residues on wildlife: Environmental toxicology of pesticides*. Academic Press, New York.

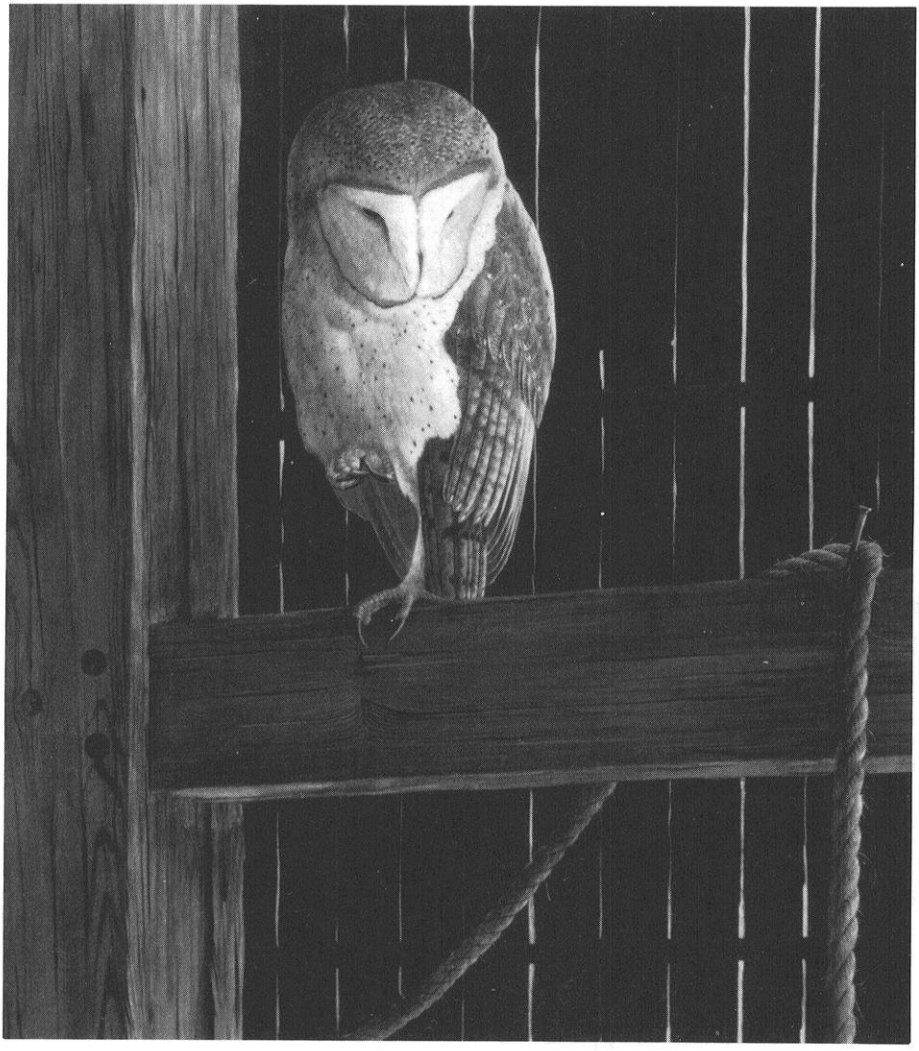
Short, H. L. 1984. Habitat suitability index models: Western grebe. U.S. Fish Wildl. Serv. FWS/OBS-82/10.69. 20pp.

Stirling, D. 1964. Western Grebe colony on Shuswap Lake revisited. *Murrelet* 45:8–9. Wetmore, A. 1924. Food and economic relations of North American grebes. *U.S. Department of Agriculture Bulletin* 1196.

Ydenberg, R. C., and L. S. Forbes. 1988. Diving and foraging in the Western Grebe. *Ornis Scandinavica* 19:129–133.

Yocum, C. F., S. W. Harris, and H. A. Hansen. 1958. Status of grebes of eastern Washington. *Auk* 75:36–47.

Thomas J. Ziebell
1322 Ceape Ave.
Oshkosh, WI 54901



Barn Owl *by Michael James Riddet* (Reprinted with permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

Breeding Birds of the St. Croix River, Wisconsin and Minnesota

The St. Croix River provides a natural, continuous, 300-km forest corridor that spans the tension zone between southern hardwood and northern mixed forest biomes. As many as 155 species may breed in the immediate river corridor. Breeding-bird surveys between River Miles 25 and 173 produced a list of 134 species, of which breeding was confirmed for 50, and is probable for another 78. These include 8 species of critical status, and many that reach limits or show marked north-south distributions along the river.

by Michael J. Mossman

The St. Croix River flows 300 km (185 miles) from its origin in far northwestern Wisconsin to its confluence with the Mississippi at Prescott. Once an important highway for the Chippewa, Sioux, early trappers and traders, and then a conduit for the southward transport of the vast pineries within its watershed, the St. Croix today remains an invaluable natural resource. The river and its forests have been maintained in a relatively wild and unpolluted condition by various state parks and forests, private landowners, and by designation as a National Scenic Riverway. It harbors several high-quality examples of native forest communities, and populations of endangered and threatened species, which include plants, insects, mussels, and breeding birds such as Bald Eagle, Osprey, Red-shouldered Hawk, and Trumpeter Swan. Along the river a nearly continuous corridor of floodplain forest extends completely across the tension zone (cf. Curtis 1959), so that southern hardwood forest birds such as Northern House Wren, Northern Cardinal, Prothonotary Warbler, and Cerulean Warbler are gradually replaced northward by their mixed hardwood-coniferous counterparts, including Winter Wren, White-throated Sparrow and a large variety of wood warblers. This sort of transitional zone between two biomes can help elucidate the factors that limit species' geographic ranges, and thus augment our understanding of habitat requirements.

The St. Croix possesses many recreational, economic, and biological values, which often suggest conflicting uses to the various agencies and landowners responsible for its management. These uses range from power production at the St. Croix Falls dam, home and campground development, logging, commercial barge traffic and speed-boating, to less intensive ones such as sport fishing, hunting, house boating, canoeing, horseback riding, hiking, and wilderness camping. Because the biological resources of the river are but one—albeit perhaps the most important—of many factors to be considered in management policies and decisions, the most essential attributes of these resources must be identified. This requires a thorough inventory, followed by a systematic assessment of their significance to help direct management and protection toward those natural communities, species, and sites of greatest value.

The present paper is a contribution to that inventory and assessment. It is based on breeding-bird surveys I conducted along the St. Croix, especially in Wisconsin, and on a few additional data sources. Thus, it is not a complete survey of the river's breeding birds, but may be a starting point that will encourage other observers to contribute data. It also identifies habitat characteristics and specific sites worthy of special management or protection on the St. Croix.

Study Area

The St. Croix River (Fig. 1) begins near Solon Springs in Douglas County, Wisconsin and flows along the Wisconsin-Minnesota state boundary before meeting the Mississippi River approximately 300 km downstream. It flows through or along 5 Wisconsin counties (Douglas, Burnett, St. Croix, Polk, Pierce) and 3 Minnesota counties (Pine, Chisago, Washington). Survey data for this paper cover a 238-km segment from Hwy 53 at Gordon (River Mile (RM) 173) to Stillwater (RM 25). The river's largest tributary is the Namekagon River, which enters at RM 148. The upper St. Croix (RM 56–167) and Namekagon were designated a National Scenic Riverway under the National Wild and Scenic Rivers Act in 1968, and the lower St. Croix (RM 0–56) was so designated in 1972. Within the Scenic Riverway, a corridor generally 1- to 3-km wide is variously protected by National Park Service (NPS) ownership and by scenic easements which may allow some logging, home construction, and private access. Dams occur at the Gordon Flowage (RM 168) and St. Croix Falls (RM 56). State properties within the Scenic Riverway include several state forests, parks, and wildlife management areas, most of them in Minnesota. My study area includes the Gordon Flowage, which extends from the dam to Hwy 53 (RM 168–173), even though it is outside the Scenic Riverway.

The upper St. Croix has occasional, small rapids and is uninhabited except for a few cabins and the Village of Danbury. The lower St. Croix is slower, wider, and its only rapids are just below the dam at St. Croix Falls. Along the section surveyed, the lower St. Croix has 5 municipalities: Taylor Falls (pop. 623), St. Croix Falls (pop. 1,497), Marine on St. Croix (pop. 543), and Stillwater (pop. 12,290). Motorboats are small and occasional above RM 68. They increase downstream, and are common and include

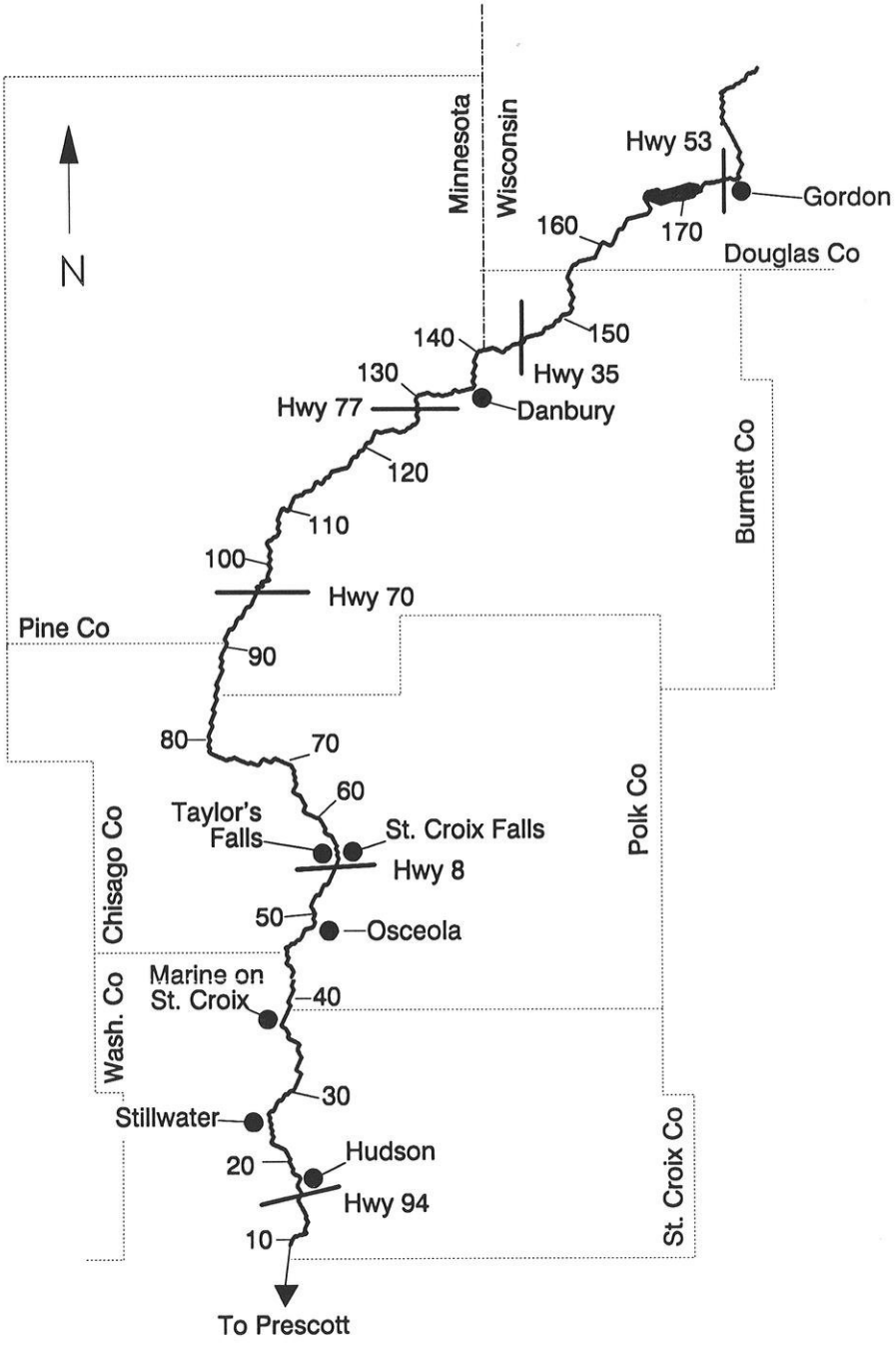


Figure 1. St. Croix River study area, with river miles. The study area extends from Stillwater (RM 25) to Hwy 53 (RM 173).

speed boats below RM 40. "Improved" campgrounds occur at several places, and primitive campsites are regular throughout. Information on the Riverway is available from the National Park Service Visitors Center in St. Croix Falls. Data for this paper come only from the immediate river corridor: the river, its floodplain (generally 0.5- to 4-km wide), and the slopes and tops of the escarpments, or river bluffs, that border the river or floodplain along much of their length.

On the upper stretches of the river, uplands are predominately second-growth northern dry-mesic and mesic forest (Curtis 1959) containing red and sugar maples, (*Acer rubrum*, *A. saccharum*), white and yellow birch (*Betula papyrifera*, *B. lutea*), basswood (*Tilia americana*), red and white oaks (*Quercus borealis*, *Q. alba*), white and red pines (*Pinus strobus*, *P. resinosa*), and bigtooth and quaking aspens (*Populus grandidentata*, *P. tremuloides*). These forests have a boreal flavor, as indicated by the presence of balsam fir (*Abies balsamea*) and a few white spruce (*Picea alba*). In damp, local sites, black spruce (*P. mariana*) and white cedar (*Thuja occidentalis*) occur. Southward the conifers become less important: spruce and fir become more restricted to shaded slopes, and disappear by about RM 155 (white spruce), RM 125 (black spruce) and RM 90 (fir, cedar). Red and white oaks increase in importance, and pines become more restricted to dry barrens (e.g. Sterling Barrens, RM 76) and blufftops (e.g., Sand Rock Cliffs, RM 99), where they may occur with red cedar (*Juniperus virginiana*), jack pine (*P. banksiana*) and sometimes Hills oak (*Q. ellipsoidalis*). Below RM 55, jack pines do not occur, red pines are rare, and whites persist mostly as scattered supercanopy trees on steep bluffsides.

According to Curtis (1959), the transitional "tension" zone between the northern mixed forest and southern hardwood forest biomes covers approximately RM 40–95. Shaded springs, spring runs, and small glens occur fairly commonly along bluffsides, especially below RM 145. Dry-mesic to mesic forest occurs in these, with dominance by mesic species such as basswood, sugar maple, red oak, yellow birch, and white pine. The understory includes species such as ironwood (*Ostrya virginiana*), musclewood (*Carpinus caroliniana*), mountain maple (*A. spicatum*), sugar maple saplings, ferns (*Osmunda*, *Athyrium*, *Thelypteris*), jewelweed (*Impatiens biflora*), skunk cabbage (*Symplocarpus foetidus*), and dwarf ginseng (*Panax trifolius*).

On the upper stretches, low-lying areas include mixed lowland forest dominated by black spruce and tamarack (*Larix laricina*) (Curtis' (1959) "northern wet forest") or by white cedar and yellow birch (Curtis' "northern wet-mesic forest"). Almost all wet sites include substantial amounts of red maple and black ash (*Fraxinus nigra*), and those dominated by these 2 species, often with alder (*Alnus rugosa*), I will term black ash swamps. Intergradations occur, and fir and white pine may occur in almost any lowland. Shrub swamps have few if any trees, and are predominantly alder, often with willows (*Salix* spp.), dogwoods (*Cornus* spp.), bog birch (*Betula glandulosa*) and various forbs, grasses, sedges, and emergents. As in the uplands, conifers disappear southward. Beginning at about RM 151, the conifer component declines while 2 hardwood species more typical of southern Wisconsin

floodplains increase: silver maple (*Acer saccharinum*) on the lowest, wettest sites, and swamp white oak (*Quercus bicolor*) on somewhat more "wet-mesic" sites. By about RM 95, the only conifers in the floodplain are occasional white pines, except for a few small isolated tamarack swamps. Cottonwood (*Populus deltoides*) and willow trees (*Salix* spp.) become fairly common along the river at about RM 80. Green ash (*Fraxinus pennsylvanica*) gradually supercedes black ash in importance. Typical lowland hardwoods or "southern floodplain forest" (Mossman 1988) begin at RM 55, and they are extensive, especially where the floodplain is broad, from here to RM 26. Narrow side channels or "sloughs" are especially characteristic of this section of the river. Most of these tracts of lowland hardwoods once had an important component of American elm (*Ulmus americana*), but most of these have succumbed to Dutch elm disease, often leaving canopy gaps that have resulted in rank growths of forbs, saplings and shrubs.

Unforested wetlands include a variety of types, examples of which are summarized in Table 1. Beaver meadows are scattered and fairly infrequent, usually dominated by grasses and sedges, often with ponds, emergents, shrubs or scattered trees. Marshes are of 2 general, intergrading types: "riverine" marshes (e.g., McLeod's Slough) experience wave action and the flushing effects of the river current, consequently accumulate little organic detritus, and are usually of a simple structure dominated by species such as river bulrush and arrowhead; "backwater" marshes are more isolated from currents (e.g., Gordon Marsh, Rice Lake Flats), or are cut off from the river (e.g., Cedar Bend North and South) and generally have a greater density and diversity of submergent and emergent vegetation.

Other, miscellaneous habitats along the river include a few oldfields and shrubby, upland sites (mostly in central sections), and low, narrow river terraces or sandbars with growths of grasses or shrubs, mainly willows and dogwoods (mostly in central and lower stretches). The St. Croix River region is described further by Faanes (1981).

Following are descriptions of several Wisconsin sites that represent the best natural communities along the river, and in which bird surveys were conducted. Information on access to State Natural Areas can be obtained from the Wisconsin Department of Natural Resources' (WDNR) Bureau of Endangered Resources.

Gordon Marsh (RM 171–173 ca 40 ha) borders the river below Hwy 53, and expands into the upper end of Gordon Flowage. It has dense and semi-open stands of emergents (Table 1) and is bordered by forested upland, homesites, and shrub swamp. Access is from a canoe landing along Hwy Y, just west of the WDNR ranger station.

The *St. Croix River Barrens and Cedar Swamp State Natural Area* (RM 118, 450 ha) includes a pine barrens that is quite distant from the river and so has been omitted from this paper. The swamp section is dominated by white cedar, black ash, and sphagnum moss, and grades into black spruce and tamarack. The dry escarpment grades from red and white oaks at its summit, to yellow birch, red maple, and black ash at its seepy base.

Kohler-Peet Swamp Hardwoods State Natural Area (RM 114, 134 ha) is

Table 1. Marshes surveyed along the St. Croix River.

Approx. River Mile	Site	County	Approx. size (ha)	Type	Dominant plants[1]
172	Gordon Marsh	Douglas	40	Flowage	Burreed, cattail, sedges, alder, pondweeds, cane
168	NW Gordon Flowage	Douglas	15	Flowage	Cattail, sedges, spikerush, bulrush
112	Ekdall Brook	Burnett	20	Beaver Meadow	Bluejoint, sedges, willow, Am. hazel
74	—	Polk	5	Beaver Meadow	Reed canary, sedges, cordgrass, willow, sensitive fern
62	—	Polk	2	River bay	Pondweeds, canary grass, roundstem, bulrush
54	Folsom Lake	Polk	10	River bay	River bulrush
51	Peaslee & Rice Lakes	Polk	15	Lake	River bulrush
50	Lower Lake	Polk	30	River bay	River bulrush, reed canary, roundstem bulrush
45	Cedar Bend North	Polk	20	Lake	River bulrush, cane
44	Cedar Bend South	Polk	15	Lake	Pondweeds, milfoil, pond lillies
43	McLeods Slough	Washington	15	River bay	River bulrush, arrowhead
34	Rice Lake Flats	St. Croix	100	River bays	River bulrush, cane

[1]alder (*Alnus rugosa*); arrowhead (*Sagittaria* spp.); bluejoint (*Calamagrostis canadensis*); bulrush, river (*Scirpus fluviatilis*); bulrush, roundstem (S. *validus*, S. *acutus*); burreed (*Sparganium* spp.); cane (*Phragmites australis*); cattail (*Typha* sp.); cordgrass (*Spartina pectinata*); fern, sensitive (*Onoclea sensibilis*); hazel, American (*Corylus americana*); lilies (*Nymphaea* spp, *Nuphar* spp.); milfoil (*Myriophyllum* spp.); pondweeds (*Potamogeton* spp.), reed canary, (*Phalaris arundinacea*); sedges (*Carex* spp.); willow (*Salix* sp.)

mostly lowland hardwoods (silver maple, elms, white ash, black ash). Nearer the uplands are black ash swamp with yellow birch, and many springs and seeps among stands of hardwoods and white cedar. There is a sedge-grass meadow, and a shrub swamp dominated by willow, alder, dogwoods, and *Spiraea*.

The *Ekdall Brook Swamp Conifer State Natural Area* (RM 111, 102 ha) extends across a wide, low terrace between river and upland. Numerous seeps near the base of the upland slope con-

Open-canopied black ash-alder swamp, prior to leaf-out of ashes (*photo by M. J. Mossman*).

tribute water to this open swamp of white cedar, tamarack, black spruce, black ash, and alder with scattered balsam fir and white birch. The understory includes sphagnum, labrador tea (*Ledum groenlandicum*), pitcher plant (*Sarracenia purpurea*), cattail, and sedges. Closer to the river are shrub-dominated thickets, marsh, meadow, and a strip of hardwoods.

Brant Brook Pines State Natural Area (RM 107, 77 ha) includes an old-growth northern dry-mesic forest dominated by red pine, with white and jack pines, red maple, red oak, bigtooth aspen, and white birch. On the seepy terrace below are mature swamp hardwoods, primarily red oak, black ash, and red maple.

St. Croix River Swamp Hardwoods State Natural Area (RM 94, 103 ha) includes an extensive swamp of basswood, black ash, elms, yellow birch, white oak, red maple, and scattered white cedar, fir, and white pine. More mesic forest grows on the springy, upland slope, and along the riverbank on the opposite side of the swamp.

Most of *Sterling Barrens State Natural Area* (RM 75, 68 ha) is rolling, sandy upland with a dry forest of jack pine and Hills oak interspersed with barrens openings that are dominated by prairie grasses. This slopes down to a river terrace forested with rather open, shrubby, lowland hardwoods dominated by silver maple, elm, black ash, cottonwood, alder, and willow.

The *Dalles of the St. Croix River State Natural Area* (RM 55, 19 ha) contains a segment of the 30 m-deep river gorge cut here in Precambrian basalt. It includes vertical cliffs, talus slopes, potholes, and various rock exposures.

Vegetation is generally sparse and xeric, including red cedar, basswood, white pine, white oak, black oak (*Q. velutina*), prairie grasses, and ericaceous shrubs.

Interstate Lowland Forest State Natural Area (RM 54, 36 ha) is a mature lowland hardwood forest dominated by silver maple, with green and black ashes, hackberry (*Celtis occidentalis*), ironwood, and cottonwood. American elms were once co-dominant, but most have died from Dutch elm disease, leaving openings rank with forbs, shrubs and saplings.

Peaslee Bottoms (RM 51, ca 280 ha) is a large terrace within a bend of the river, containing a narrow, navigable slough, rocky knolls, and several ponds and lakes (including Rice, Peaslee, and Long Lakes) that contain some marsh (Table 1). The lower end of the tract consists of mature, open-grown silver maples growing on narrow spits between sloughs. The upper section is mostly young lowland hardwoods dominated by silver maple and green ash, with some oaks on the knolls and ridges. Springs and a rocky stream enter from the adjacent uplands. Access to this and the following sites is by boat, from the river.

Farmington Bottoms (RM 40, ca 260 ha) is probably the highest quality tract of lowland hardwoods on the St. Croix. This is a terrace approximately 4 km long and 0.5–1 km wide, dissected by narrow slough channels, most of which are isolated, truncated, or dry. It includes mature lowland hardwoods, including southern wet forest dominated by silver maple, and wet-mesic forest dominated by swamp white oak, ashes, and silver maple.

Rice Lake Flats (RM 33–35, ca 340 ha) is a complex of open, silver maple sloughs, backwaters, and marshes at the inflow of the Apple River (Table 1).

Methods

During the 1989 spring migration season, I canoed from Gordon (RM 173) to Hudson (RM 20), beginning at 1825h on 27 April, making overnight camps at RM 170, 156, 125, 108, 79, 55, and 35, and ending at 1730h on 4 May.

Along each section of the river, I recorded the general abundance of each species, and precise numbers of Louisiana Waterthrushes, Red-shouldered Hawks, Red-bellied Woodpeckers, and other unusual species. Daily maximum temperatures ranged from about 35° to 60°F. Rain or snow occurred on 4 of the 8 days.

Most of the data in this report came from my canoe trip during the 1990 breeding season, beginning at RM 173 at 2100h, 1 June, and ending at Stillwater (RM 25) at 2000h, 10 June. During 8–10 June I was joined by Lisa Hartman, in a collaborative effort with the Minnesota Department of Natural Resources County Biological Survey (MCBS) (Stucker and Nordquist, in prep.). I camped at RM 171, 166, 145, 131, 108, 79, 55, 46, and 35. Maximum temperatures ranged from about 55° to 80°F, and rain occurred on 3 of the 10 days. I began canoeing each morning at 0500–0620h and ended at 1900–2230h. Each full day that I was on the river, I spent 5–10 hours attempting to record all birds seen or heard. During the remaining time, I counted only species of special interest, such as Louisiana Waterthrush. Throughout the day I made notes on bird habitats and habitat use, inspected potential nest sites, investigated sloughs and backwaters, and walked

into various upland and lowland sites. Progress was most rapid on the upper stretches of the river, where currents were relatively swift and there were few sloughs and backwaters to investigate. Among the fairly extensive river bottoms within RM 26–55, I targeted the wildest tracts accessible by canoe, spending most of my time on the Wisconsin side.

Data from several other sources are also presented here. On 23 and 26 June 1982, NPS Ranger Joseph Hudick and Naturalist Thomas Van Zoeren ran a survey by motorboat, stopping every half mile (0.8 km) for a 3-minute count period, between RM 56 and RM 26—a total of 50 stops.

Breeding-bird surveys were conducted at several Wisconsin sites during 1976–1990, most of them as part of the WDNR's Natural Areas Breeding Bird Survey (Mossman and Matthiae 1988). Some surveys were part of the 1990 canoe trip. The sites were described above. Following are the dates and observers for these surveys: *Gordon Flowage*: 2 July 1980, 20 May 1988, 28 April 1989, 18 May, 1 and 2 June 1990 (Mossman); 30 June, 1 July 1990 (Hartman). *St. Croix River Cedar Swamp*: 30 June 1980 (Mossman), 3 July 1985 (Hoefler, Kooiker). *Kohler-Peet Swamp Hardwoods*: 29 June 1980 (Mossman); 21 June 1990 (Hoefler). *Ekdall Brook Conifer Swamp*: 15 June 1989 (Hoefler, Kooiker); 5 June 1990 (Mossman). *Brant Brook Pines*: 15 June 1985 (Hoefler, Kooiker); 6 June 1990 (Mossman). *St. Croix River Swamp Hardwoods*: 28 June 1980 (Mossman); 30 June 1987, 14 June 1990 (Hoefler, Kooiker). *Sterling Barrens*: 7 June 1975, 22 June 1976, 10 June 1977

Backwater marsh at Rice Lake Flats (*photo by M. J. Mossman*).

(Faanes); 7 June 1984 (Epstein). *Dalles of the St. Croix River*: 25 June 1989 (Hoffman); 8 June 1990 (Hartman, Mossman). *Interstate Floodplain Forest*: 6 June 1984 (Epstein); 25 June 1989 (Hoffman); 8 June 1990 (Hartman, Mossman). *Peaslee Bottoms*: 8 June 1990 (Hartman, Mossman). *Farmington Bottoms*: 30 June 1986 (Kearns, Mossman); 9 June 1990 (Hartman, Mossman). *Rice Lake Flats*: 10 June 1990 (Hartman, Mossman).

Extra data on Osprey, Bald Eagle, and Great Blue Heron nests were obtained from Minnesota Natural Heritage Database (MNHD), WDNR and NPS. The MNHD and MCBS also provided records of Red-shouldered Hawk and Louisiana Waterthrush (Eliason 1988, Stucker and Nordquist in prep.).

Results

Table 2 lists data for the 134 species recorded on breeding-season surveys, plus individuals of 2 domestic species, which had obviously escaped captivity. As described in the following species accounts, 50 species are considered confirmed breeders, on the evidence of an active nest or local, dependent young, and another 78 species probably breed. The breeding status of 4 species is questionable. Two species recorded on these surveys (Double-crested Cormorant and Caspian Tern) almost certainly do not breed on the St. Croix. The list of 134 species includes several of critical status in Wisconsin or Minnesota (Table 3). A few additional species not encountered on these surveys may breed here as well, bringing the total number of potential breeders to about 155. These include Northern Goshawk, and Solitary Vireo, which have been known to nest here (MNHD unpubl., Faanes 1981), Acadian Flycatcher, which has been found along Lawrence Creek near RM 53 in 1976 (Bratlie 1976), and 1977 (MNHD, unpubl.), others such as American Black Duck and Sandhill Crane, which I encountered only in late April or early May, and still others (e.g., Saw-whet Owl, Connecticut Warbler) known to breed nearby.

In the following accounts, each species' name is followed by codes for abundance (A = Abundant, C = Common, FC = Fairly Common, U = Uncommon, R = Rare), and breeding status (cb = confirmed, pb = probable, qb = questionable, u = unlikely); then by the river miles in which it was recorded (using all data from Table 2), and a brief description of breeding-season habitats on the St. Croix. When year is not given for specific occurrences, 1990 is to be assumed; and the exact date may be determined from the given river mile and the canoe survey itinerary given in Methods.

Species Accounts

Common Loon.—R, cb. RM 170. Lake. Breed at Gordon Flowage, where there were 2–3 pairs on 27 April 1989, and one pair on 2 June 1990. Fred Strand (pers. comm.) found a total of 9 adults and 2 single-chick broods here on 14 July 1990.

Pied-billed Grebe.—U, cb. RM 171–172. Marsh. Fairly widespread on river during migration, but found breeding only at Gordon Flowage, where I recorded 11 birds in June 1990, and found 2 nests on 20 May 1988. Hartman found 2 broods in 1990. Possibly breeding at Wild River State Park (MN), where one called on 2 May 1989, and at Rice Lake Flats.

Table 2. Results of breeding-bird counts along the St. Croix River.

Species	Number of individuals counted at indicated site or route[1,2]													
	Canoe	MB	GM	CS	KP	EB	B	SH	SB	DS	IF	PB	FB	RL
Common Loon	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Pied-billed Grebe	11	—	11	—	—	—	—	—	—	—	—	—	—	—
Double-crested Cormorant	2	—	—	—	—	—	—	—	—	—	—	—	—	—
American Bittern	4	—	3	—	—	—	—	—	—	—	—	—	—	—
Least Bittern	1	—	+	—	—	—	—	—	—	—	—	—	—	1
Great Blue Heron	97	11	7	—	1	2	—	+	—	—	+	1	4	1
Great Egret	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Green-backed Heron	6	10	2	—	—	—	—	—	—	—	+	—	—	1
Trumpeter Swan	1(3)	—	—	—	—	—	—	—	—	—	—	—	—	—
Mute Swan	11(11)	—	7	—	—	—	—	—	—	—	—	—	—	—
Canada Goose	31(47)	25	+	—	—	—	—	—	—	—	—	—	—	—
Wood Duck	87(99)	3	13	—	+	—	—	—	—	—	2	5	1	5
Mallard	100(105)	—	7	—	—	—	—	—	—	—	—	8	+	8
Blue-winged Teal	13(13)	—	9	—	—	—	—	—	—	—	—	—	—	—
Ring-necked Duck	0(3)	—	—	—	—	—	—	—	—	—	—	—	—	+
Common Goldeneye	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Hooded Merganser	24(28)	—	—	—	—	—	—	—	—	—	1	1	+	1
Common Merganser	18(25)	—	—	—	—	—	—	—	—	—	—	—	—	—
Turkey Vulture	13	—	—	—	—	—	—	—	—	—	—	1	2	—
Osprey	2(3)	1	1	—	—	—	—	—	—	—	—	—	—	—
Bald Eagle	20(21)	5	—	—	—	—	—	—	—	—	—	—	—	+
Sharp-Shinned Hawk	2	—	—	1	—	—	—	—	—	—	—	—	—	—
Cooper's Hawk	2(3)	—	—	—	—	—	—	—	—	—	—	—	—	—
Red-Shouldered Hawk	21(23)	4	—	—	—	—	+	1	—	—	+	1	2	2
Broad-winged Hawk	4(5)	—	—	—	—	—	—	—	+	—	—	—	—	—
Red-tailed Hawk	2	—	—	—	—	—	—	—	+	—	—	—	—	—
American Kestrel	—	—	—	—	—	—	—	—	+	—	—	—	—	—
Ring-necked Pheasant	—	4	—	—	—	—	—	—	—	—	—	—	—	—
Ruffed Grouse	8	—	—	—	+	1	—	2	1	—	—	—	—	—
Virginia Rail	1(2)	—	—	—	—	—	—	—	—	—	—	—	—	+
Sora	4	—	4	—	—	—	—	—	—	—	—	—	—	—
American Coot	5	—	4	—	—	5	—	—	—	—	—	—	—	—
Killdeer	1	1	+	—	—	—	—	—	—	—	—	—	—	—
Spotted Sandpiper	46	2	—	—	+	—	—	—	—	—	—	—	—	4
Common Snipe	3	—	+	—	+	—	—	—	1	—	—	—	—	—
American Woodcock	0(2)	—	—	—	3	—	—	—	1	—	—	—	—	—
Caspian Tern	—	20	—	—	—	—	—	—	—	—	—	—	—	—
Black Tern	60	—	40	—	—	—	—	—	—	—	—	—	—	—
Rock Dove	5	4	—	—	—	—	—	—	—	—	—	—	—	—
Mourning Dove	24	9	—	—	+	—	—	—	1	1	—	2	+	7
Black-billed Cuckoo	12	—	1	—	1	—	—	+	+	—	—	—	1	—
Yellow-billed Cuckoo	4	—	—	—	—	—	—	1	1	—	—	—	+	1
Great Horned Owl	1	—	—	—	—	—	—	—	—	—	—	—	1	—
Barred Owl	9	—	—	—	—	—	—	+	—	—	—	—	—	—
Common Nighthawk	19	—	—	—	—	+	—	—	—	—	—	—	—	+
Whip-poor-will	4	—	—	—	—	—	—	—	—	—	—	—	—	+
Chimney Swift	6	4	—	—	—	—	—	—	—	—	—	—	2	—
Ruby-throated Hummingbird	2	—	—	—	+	—	—	—	—	—	+	—	—	—
Belted Kingfisher	22	12	—	—	—	1	—	—	—	—	+	1	1	1
Red-headed Woodpecker	1	1	—	—	—	—	—	—	+	—	+	—	—	—
Red-bellied Woodpecker	46(52)	7	—	—	+	—	2	+	—	—	+	4	5	7
Yellow-bellied Sapsucker	17	2	—	—	1	—	—	1	+	—	+	2	—	—
Downy Woodpecker	44	1	—	—	4	+	—	+	1	1	1	1	6	2
Hairy Woodpecker	30	4	—	—	—	—	—	2	+	+	1	—	1	1
Northern Flicker	13	7	—	—	—	1	—	—	1	—	+	—	2	—
Pileated Woodpecker	33	6	—	1	4	—	—	1	+	1	1	1	1	—
Olive-sided Flycatcher	1	—	—	—	—	—	—	—	1	—	—	—	—	—
Eastern Wood-Pewee	117	9	—	1	7	2	4	3	4	1	8	5	7	6
Yellow-bellied Flycatcher	1	—	—	—	—	—	—	—	—	—	—	—	—	—

(*continued*)

Table 2. (*Continued*)

Species	Number of individuals counted at indicated site or route[1,2]													
	Canoe	MB	GM	CS	KP	EB	B	SH	SB	DS	IF	PB	FB	RL
Alder Flycatcher	19	—	5	—	1	2	—	—	—	—	—	—	—	—
Least Flycatcher	70	—	—	—	+	2	9	+	+	—	—	9	2	6
Eastern Phoebe	13	5	—	—	—	—	—	—	—	1	—	—	—	—
Great Crested Flycatcher	246	38	—	2	5	3	3	7	3	2	7	14	13	7
Eastern Kingbird	39	1	2	—	—	—	—	+	1	—	1	4	—	1
Purple Martin	4	—	—	—	—	—	—	—	—	—	—	—	—	—
Tree Swallow	384	24	9	—	+	3	—	—	+	—	4	20	9	37
N. Rough-winged Swallow	145	45	—	—	—	—	—	—	—	10	5	9	2	1
Bank Swallow	73	150	—	—	—	—	—	—	—	—	—	5	—	—
Cliff Swallow	73	150	—	—	—	—	—	—	—	—	—	—	—	—
Barn Swallow	55	—	+	—	—	—	—	—	—	—	—	—	—	—
Blue Jay	74	47	—	4	5	—	2	2	5	1	2	4	2	—
American Crow	65	82	—	—	+	—	3	1	1	3	2	—	3	4
Common Raven	14	—	—	—	+	—	—	—	—	—	—	—	—	—
Black-capped Chickadee	37	12	—	8	2	—	2	3	5	9	+	3	6	1
Red-breasted Nuthatch	7	—	—	4	—	—	—	—	—	—	—	—	—	—
White-breasted Nuthatch	47	20	—	+	4	—	2	4	1	1	4	5	3	3
Brown Creeper	41(43)	—	—	—	3	—	—	2	—	—	3	3	6	3
Northern House Wren	58	33	—	—	—	—	—	—	1	3	8	7	10	3
Winter Wren	10	—	—	8	—	—	2	4	—	3	—	—	—	—
Marsh Wren	29	—	10	—	—	—	—	—	—	—	—	—	—	15
Sedge Wren	9	—	6	—	+	—	—	—	—	—	—	—	—	—
Blue-gray Gnatcatcher	68(73)	7	—	—	—	+	—	—	—	3	5	—	8	7
Eastern Bluebird	16(19)	—	—	—	+	—	—	—	2	—	+	2	1	2
Veery	41	—	—	—	6	2	2	8	+	—	—	—	—	—
Hermit Thrush	1	—	—	—	—	—	—	+	—	—	—	—	—	—
Wood Thrush	7(11)	3	—	—	1	—	—	—	—	—	—	—	—	+
American Robin	100	14	1	—	+	1	1	1	+	5	4	11	6	1
Gray Catbird	23	1	2	—	1	2	—	—	1	—	1	—	—	—
Brown Thrasher	2	—	—	—	—	—	—	—	+	1	—	—	—	—
Cedar Waxwing	295	2	—	2	1	3	—	1	1	2	+	10	4	8
European Starling	+	2	—	—	—	—	—	—	—	—	+	—	—	—
Yellow-throated Vireo	48(57)	—	—	1	—	1	1	—	2	2	3	2	+	3
Warbling Vireo	36	4	—	—	—	—	—	—	—	—	—	5	2	3
Red-eyed Vireo	518	7	—	3	24	—	10	14	4	3	7	2	12	3
Blue-winged Warbler	1	—	—	—	—	—	—	—	1	—	—	—	—	—
Golden-winged Warbler	39	—	3	—	+	2	2	—	1	—	1	—	—	—
Nashville Warbler	29	—	—	7	1	+	—	4	3	—	—	—	—	—
Northern Parula Warbler	23	—	—	1	—	—	3	—	—	—	—	—	—	—
Yellow Warbler	56	—	5	—	+	2	2	—	+	—	—	—	—	3
Chestnut-sided Warbler	54	—	—	—	+	1	3	+	+	—	—	—	—	—
Cape May Warbler	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Yellow-rumped Warbler	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Black-throated Green Warbler	—	—	—	5	—	—	—	—	—	—	—	—	—	—
Blackburnian Warbler	7	—	—	1	—	—	—	—	—	—	—	—	—	—
Pine Warbler	13	—	—	—	—	—	2	—	—	+	—	—	—	—
Cerulean Warbler	7(7)	—	—	—	—	—	—	3	—	—	3	—	1	—
Black-and-White Warbler	27	—	—	—	1	2	8	+	1	—	—	—	—	—
American Redstart	95	—	—	—	1	—	3	—	1	—	+	—	—	3
Prothonotary Warbler	65(66)	23	—	—	—	—	—	—	—	—	—	5	19	12
Ovenbird	121	—	—	6	14	1	8	7	10	—	—	1	+	—
Northern Waterthrush	17	—	—	—	—	1	—	—	—	—	—	—	—	—
Louisiana Waterthrush	14(25)	—	—	—	—	—	—	—	—	—	1	2	—	—
Mourning Warbler	37	—	—	—	13	—	—	—	2	—	+	—	—	—
Common Yellowthroat	227	21	7	3	31	3	4	3	3	—	10	7	8	9
Canada Warbler	32	—	—	6	—	—	3	2	—	—	—	—	—	—
Scarlet Tanager	47	2	—	—	—	—	2	6	1	—	1	—	+	—
Northern Cardinal	3	1	—	—	—	—	—	—	—	1	+	—	—	1
Rose-breasted Grosbeak	43	8	—	2	4	—	—	+	2	—	2	5	1	1
Indigo Bunting	35	3	—	—	1	—	—	3	5	+	4	1	—	—

(*continued*)

Table 2. (*Continued*)

Species	Number of individuals counted at indicated site or route[1,2]													
	Canoe	MB	GM	CS	KP	EB	B	SH	SB	DS	IF	PB	FB	RL
Rufous-sided Towhee	1	—	—	—	—	—	—	—	+	—	—	—	—	—
Chipping Sparrow	17	7	—	—	—	1	2	—	4	4	2	1	—	—
Field Sparrow	1	—	—	—	—	—	—	—	2	—	—	—	—	—
Song Sparrow	513	67	—	—	20	—	—	+	2	+	11	13	34	27
Swamp Sparrow	21	—	11	—	9	1	—	—	—	—	—	—	—	—
White-throated Sparrow	8	—	—	1	2	—	—	+	—	—	—	—	—	—
Red-winged Blackbird	216	2	69	—	+	2	—	—	—	—	—	16	—	60
Yellow-headed Blackbird	149	—	121	—	—	—	—	—	—	—	—	—	—	15
Common Grackle	52	13	—	—	+	—	—	—	+	—	2	2	3	1
Brown-headed Cowbird	60	2	—	1	5	—	—	—	2	+	1	6	7	3
Northern Oriole	116	9	—	—	+	—	—	—	+	—	7	6	10	10
Purple Finch	1(3)	—	—	—	—	—	—	—	—	—	—	—	—	—
American Goldfinch	99	27	2	—	1	—	—	1	2	5	5	4	8	3
Evening Grosbeak	0(2)	—	—	—	—	—	—	—	—	—	—	—	—	—
House Sparrow	+	—	—	—	—	—	—	—	—	—	—	—	—	—
Domestic Goose	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Domestic Peafowl	—	—	—	—	—	2	—	—	—	—	—	—	—	—

[1]Canoe: Canoe survey from Gordon to Stillwater, 1–10 June 1990, including data in this table from GM, IF, PB, FB, RL. Numbers in parentheses are for species of special interest, and include birds observed both within and outside the formal count periods described in Methods. MB: Motorboat survey, St. Croix Falls to Stillwater, 23 and 26 June 1982. **GM**: Gordon Marsh, 2 June 1990. **CS**: St. Croix River Cedar Swamp, 30 June 1980. **KP**: Kohler-Peet Swamp Hardwoods, 29 June 1980. **EB**: Ekdall Brook Conifer Swamp, 15 June 1989. **BB**: Brant Brook Pines, 15 June 1985. **SH**: St. Croix River Swamp Hardwoods, 28 June 1980. **SB**: Sterling Barrens, 7 June 1984. **DS**: Dalles of the St. Croix River, 25 June 1989. **IF**: Interstate Floodplain Forest, 8 June 1990. **PB**: Peaslee Bottoms, 8 June 1990. **FB**: Farmington Bottoms, 9 June 1990. **RL**: Rice Lake Flats, 10 June 1990.

[2] + = recorded on a survey other than that noted in footnote 1 (see Methods). For canoe survey, + = recorded only outside formal count periods.

Double-crested Cormorant.—R, ub. RM 26. River, backwater, larger sloughs. Common during migration. In 1989 I recorded approximately 160, in groups as large as 60, an obvious increase since Faanes' (1981) report. Although some cormorants were perched near and at the edges of heron colonies, careful inspection revealed no nesting. The few that remain through the breeding season apparently do not nest.

American Bittern.—U, pb. RM 71, 172. Marsh, shrub swamp.

Least Bittern.—R, pb. RM 34, 172. Marsh. At Rice Lake Flats (1990) and Gordon Marsh (1 on 20 May 1988, 3 on 1 July 1990).

Great Blue Heron.—C, cb. RM 25–173. River, marsh, shrub swamp, slough, and backwater. More common below RM 85 than above. At least 4 colonies have been recorded in recent years, 3 of which were active in 1989 and 1990. All were in floodplain hardwoods either on islands or in woods separated from the mainland by substantial sloughs. Table 4 summarizes recent nest counts at these colonies, and includes some discrepancies due to counts obtained by different observers or methods, or on different dates. A total of approximately 115–200 nests were active in 1989 and 1990. Other colonies were reported from 1941 at the "Kohler peat marsh, near mouth of Clam River" (RM 119) (Williams 1957), and in white pines "close to the St. Croix River in Burnett County" (Faanes 1981). Non-breeding Double-crested Cormorants and Great Egrets are occasionally found perched

Table 3. Special status of St. Croix River breeding-birds in Wisconsin and Minnesota.

Species	Status in indicated state: Wisconsin	Minnesota
American Bittern	—	Special concern
Great Egret	Threatened	—
Trumpeter Swan	Endangered	—
Osprey	Threatened	Special concern
Bald Eagle	Threatened	Threatened
Red-Shouldered Hawk	Threatened	Special concern
Cerulean Warbler	Threatened	—
Louisiana Waterthrush	—	Special concern

at the edges of active Great Blue Heron colonies on the St. Croix, and in 1986 egrets did nest at the Rice Lake Flats colony.

Great Egret.—R, cb. RM 33–70. River, marsh, slough, backwater. Nesting has been confirmed only at the Rice Lake Flats Great Blue Heron colony, where 1–3 pairs nested in 1986. I found 10 along the river in 1989.

Green-backed Heron.—U, pb. RM 32–172. Shrub swamp, marsh, backwater.

Trumpeter Swan.—R, cb. RM 31–102. River, marsh, backwater. Several birds have appeared in recent years, from Minnesota and Wisconsin restoration programs and from private propagator Ray Whitney.

In 1990, at least 8 restoration birds were present between spring and winter, mostly within RM 56–102: 4 1-yr-olds (collars 13–16KT) released in 1989 as "decoy-reared cygnets" near Grantsburg, Wisconsin (where 13KT died during summer 1990); a 2-yr-old (collar 24KU) released in April 1990 as a wing-clipped subadult near Grantsburg, which flew to the river after its summer moult; a 3-yr-old (wing tag 92) released, wing-clipped, in Minnesota in 1989; 2 3-yr-olds (2–3KU) released as wing-clipped subadults in Burnett County in 1989, which appeared on the river in spring 1990 before separating and moving to different areas in Minnesota.

This year also saw the first documented nesting of trumpeters on the river, and only the third recent documented nesting in Wisconsin. One or both of the unmarked adults were originally released by Ray Whitney. They nested in a backwater rich in submergents, separated from the river, near Cedar Bend. The nest was discovered on 7 June, and was first inspected on 13 June, when it contained 5 well-incubated eggs. An observer reported that all 5 eggs hatched, but on 29 June I found only 3 cygnets remaining. One of these disappeared between 14 Aug. and 24 Sept., when a WDNR crew and I captured and collared the 2 remaining cygnets (52KT, 53KT) and the adult male (26KU). The cygnets fledged but on 21 October the adult male and cygnet 53KT were mistakenly shot and killed by a goose hunter on the Minnesota side of the river. On 30 November, the remaining adult and cygnet were on a stretch of open water at Rice Lake Flats, along with Canada Geese, ducks, and Wisconsin's only

Table 4. Nest counts at Great Blue Heron colonies on the St. Croix River, RM 25-173.

Colony	Year	Number of Nests			Observer	Method	Date
		Active	Inactive	Total			
Stillwater	1989	7	—	—	Mossman	ground	4 May
(RM 26, MN)	1989	—	—	13–14	MNHD	—	Winter
	1990	11	—	—	Galli/MNHD	air	1 May
	1990	18	6	24	Mossman/ MNHD	ground	10 June
Rice Lake Flats	1978	"active"	—	—	Faanes	—	—
(RM 34, WI)	1986	40[1]	—	—	Mossman	ground	30 June
	1987	36	—	—	Grant	air	28 July
	1988	67	11	78	Grant	ground	5 May
	1988	103	—	—	Mossman	air	18 May
	1989	81	8	89	Blumenschine	ground	3 May
	1989	Ca. 120	—	—	Mossman	ground	4 May
	1990	22	47	69	Grant	ground	26 April
	1990	—	—	35–40	Mossman	air	29 Nov
Cedar Bend	1977	"small colony"	—	—	L. Knudson	—	—
(RM 45, MN)	1980	8–12	—	—	Hudick	—	—
	1983	4	—	—	Hudick	—	—
	1986	60	—	—	Coffin/MNHD	ground	29 March
	1986	67–75	—	—	Mossman	ground	30 June
	1987	63	—	—	Grant	air	28 July
	1988	75	9	84	Grant	ground	6 May
	1989	74	14	88	Bluemenschine	ground	3 May
	1990	76	42	118	Grant	ground	2 May
	1990	—	—	75	Mossman	air	29 Nov
Goose Creek	1976	—	—	35	MDNR	—	—
(RM 80, MN)	1985	10	—	—	MDNR	air	28 June
	1986	30–40	—	—	MNHD	—	—
	1987	20	—	—	MNHD	—	—
	1988	"not found"	—	—	MNHD	air	—
	1990	"gone"	—	—	MNHD	—	—
Kettle River	1986	20–30	—	—	Voelker	air	28 April
("Two Rivers")	1987	inactive	—	—	MNHD	—	—
(RM 107, MN)	1988	inactive	—	—	Grant	ground	29 April
Unnamed (ca. RM 128, WI)	1973	—	—	15–20	Vallem	—	—
St. Croix	1981	"good-sized"	—	—	MNHD	—	—
(RM 138, MN)	1989	"not found"	—	—	MNHD	—	—
	1990	"gone"	—	—	MNHD	—	—
Gordon Flowage	"late 60's"	—	—	1–3	Strand	—	—
(RM 168, WI)	"early 70's"	—	—	"extinct"	Strand	—	—

[1]All breeding-season counts are known or apparent Great Blue Heron nests, except at Rice Lake Flats in 1986, where 40 active nests included 1–3 nests of Great Egret.

other known trumpeter family for 1990 (2 adults and 3 cygnets), which had nested on Oakridge Lake about 21 km distant. By 2 January 1991, the adult and cygnet had moved to Whitney's lake, 15 km west of Stillwater.

In summer and fall of 1989, 2 unmarked swans frequented the Cedar Bend area. Presumably, this was the pair that nested in 1990. Near Osceola, 2 unmarked swans were reported repeatedly in 1987, a single swan (Tag 110) was seen on 4 May 1988, and an aggressive swan—apparently imprinted on humans, and nicknamed "The Killer"—was removed as a public nuisance in 1989. All of these birds evidently originated from the Whitney game farm.

In 1985, 2 trumpeters appeared at

Beaver meadow at Ekdall Brook Natural Area (*photo by M. J. Mossman*).

Gordon Flowage, where they displaced resident Mute Swans. They built a nest-like structure, but did not nest. One of the birds (collar 33NC) originated from the Hennepin County (MN) restoration program. It returned alone in 1986, and died of lead-poisoning the following winter in Iowa (Fred Strand and Donna Compton, pers. comm.).

Mute Swan.—U, cb. RM 171–173. Marsh, lake. This exotic species occurred only at Gordon Marsh and the adjacent open water of the flowage. I had found none here on 2 July 1980. A pair first appeared and began nesting on the flowage in 1980, 2 pairs were nesting by 1985, and 3 pairs were nesting by 1987 (Superior Evening Telegram 18 April 1985, John Kiel, pers. comm.). On 20 May 1988 I found 3 active nests, containing: 7 eggs, 7 eggs, and 3 eggs plus 1 cygnet. On 28 April 1989 there were 3 nests in roughly the same sites, containing 8, 4 and 8 eggs. On 18 May 1990 I found 4 territorial pairs, only 3 of which had nests, with clutches of 5, 9, and 4 eggs. On 1 and 2 June 1990, there were 4 pairs, a subadult, 2 yearlings, and possibly 2 additional adults. The "fourth" pair still had no nest, but it did by 1 July, when Hartman found the female incubating at least 2 eggs. Production at this colony is usually poor, and at least 2 of the 4 nesting pairs raised no young in 1990. All swans at Gordon are of the light-legged ("Polish") phase.

Canada Goose.—FC, cb. RM 56–172. River, marsh, backwater. Almost all were in flocks, between Gordon and St. Croix Falls. A total of 6 broods, and

a nest of 6 eggs on a small, high island at about RM 117.

Wood Duck.—C, cb. RM 32–172. River, marsh, slough, backwater, shrub swamp. Six broods recorded on the 1990 trip.

Mallard.—C, cb. RM 25–172. River, marsh, shrub swamp, slough, backwater, lake, grassy river edges. Four broods seen on the 1990 trip. Urban populations at Stillwater and Hudson.

Blue-winged Teal.—U, pb. RM 115–130, 168–172. River, marsh, shrub swamp. Twelve of 13 recorded in 1990 were in Gordon Marsh and small wetlands along the flowage.

Ring-necked Duck.—R, pb. RM 33. Over 100, in small flocks and scattered pairs during the migration-season trip in 1989. On June 1990 trip, only at Rice Lake Flats.

Common Goldeneye.—R, qb. RM 130. River. During the 1989 trip, I counted at least 30, scattered between Gordon and St. Croix Falls. The June 1990 survey produced just one.

Hooded Merganser.—FC, cb. RM 27–166. Slough (more so than other ducks), river, marsh. Most were within RM 113–166. Noted 4 broods.

Common Merganser.—FC, cb. RM 83–166. River, especially near rapids and riffles, where rocks are often stained with their whitewash. Most were from RM 85 to RM 108. Roberts (1932) stated that this species "bred in southern Minnesota as late as the 1880's, but there is no evidence that it has nested south of the northern third of the state for many years past". Janssen's (1987) and Robbins' (1991) breeding range maps for this species reach along the interstate border only as far south as Duluth. Faanes (1981) knew of only 2 summer records in the St. Croix river area, which he considered "lingering migrants." In contrast, I found 25 adults and 5 broods on the St. Croix during my June 1990 survey. Each brood consisted of downy chicks, with an adult female: 9 chicks, between rapids (RM 158, WI, 3 June); 10 chicks (RM 156, WI, 3 June); 4 chicks, sometimes on female's back, harassed by immature Bald Eagle (RM 140, MN, 4 June); 7 chicks, some of which rode on female's back (RM 102, WI, 6 June); brood on boulder near riffles (RM 95, WI, 6 June). This is a significant extension of the Common Merganser's known breeding range in these 2 states.

Turkey Vulture.—FC, pb. RM 40–170. Scattered throughout in groups of 1–7, especially along bluffs. Apparent pre-roost evening flights occurred on 28 April 1989 (4 birds at RM 156, WI), 3 May 1989 (5 birds, RM 40, MN), and 8 June 1990 (7 birds at RM 50, WI). One flushed from a dead skunk in a small slough at RM 36, and one perched near potential nest sites on a cliff at RM 48 (WI) on 3 May 1989. Jackson (1941) frequently saw what he suspected was a nesting pair at about RM 54, in May 1919.

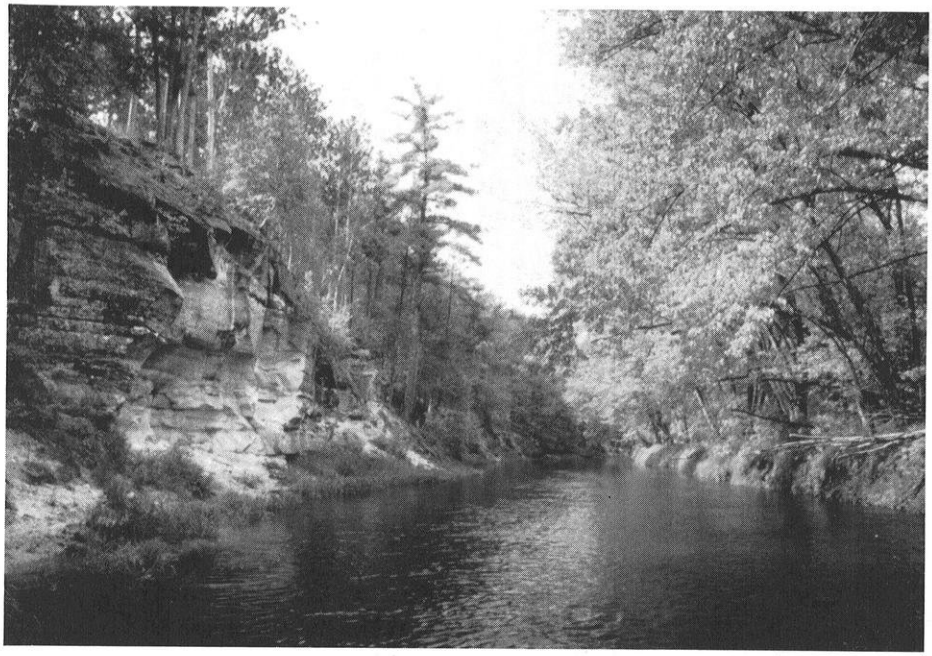
Osprey.—R, cb. RM 70, 162–172. River, backwater. I found 15–20 Ospreys scattered from Gordon to Stillwater during the April/May trip in 1989, but on the June 1990 trip I found birds only at RM 70 and at 2 active nests, which were on artificial

platforms at RM 172 and RM 163, both in Burnett County. WDNR's statewide Osprey survey indicates no other recent nests on Wisconsin portions of the river, although many nests have been active at nearby Crex Meadows Wildlife Area (Burnett County). According to that survey, the RM 172 nest was first used in 1987, when it produced 2 young, and it was inactive in 1988 and 1989. The other nest showed its first activity in 1988, when it was attended but eggs were apparently not laid; 3 young were produced in 1989.

Bald Eagle..—FC, cb. RM 33–171. River, backwater, lake. I found about the same number of eagles on both canoe trips. In 1990 half of these were encountered above RM 130, and numbers of adults and immatures were approximately equal. On 4 June 1990 an immature swooped repeatedly over a Common Merganser female and brood. In 1989 I saw 3 active nests in Wisconsin, within RM 90–170. Two of these had not been previously reported and are probably of recent origin. According to data from NPS and WDNR, there were 12 active breeding territories within RM 25–173 in 1990.

Sharp-shinned Hawk.—U, cb. RM 77–145. Lowland hardwoods. One carried prey. A fledgling begged for food on 30 June 1980 (RM 118, WI). Reported by Jackson (1941) at St. Croix Falls on 22 May 1919.

Cooper's Hawk.—U, pb. RM 48–125. Lowland hardwoods, mixed upland



Red pines atop sandstone cliff, white pine in distance, and lowland hardwoods, along slough at Sand Rock Cliffs, RM99 (*photo by M. J. Mossman*).

forest. Birds "kakked" at RM 125 (WI) and RM 48 (MN). Reported at Danbury on 31 May 1919 (Jackson 1941).

Red-shouldered Hawk.—C, cb. RM 26–107, 143. Lowland hardwoods and adjacent forested bluffsides. I recorded 15 birds and 3 active nests (Burnett, Polk, and Chisago counties) in 1989, 25 birds in 1990, and an active nest (Burnett County) in 1980. In 1990, the 25 birds were on separate territories, which did not include: at least 7 of the territories located in 1989; 15 other territories identified by MCBS along this stretch of river in Washington County in 1988 (Eliason, 1988), Chisago County in 1990 (Stucker and Nordquist in prep.), and adjacent Wisconsin; and probably others in suitable habitat where birds did not happen to be calling as I passed by. There are probably at least 55 active breeding territories along the St. Croix between RM 26 and RM 143.

The species became more abundant southward on the river (Table 5) as the extent of floodplain hardwoods increased. It has evidently increased in numbers since the early 1900's, when the sighting of a single bird along the St. Croix was noteworthy (Roberts 1932). However, Midwestern populations of the Red-shouldered Hawk are threatened by the species' dependence on extensive tracts of relatively undisturbed lowland and bluffside forest (Bednarz and Dinsmore 1981, Mossman 1988). The continuity of the St. Croix River's forest corridor is essential to its important Red-shoulder breeding population.

Broad-winged Hawk.—U, pb. RM 65–167. Extensive forest. Four of my 5 sightings were above RM 134. Jackson (1941) noted it at St. Croix Falls and Danbury in late May of 1919.

Red-tailed Hawk.—U, cb. RM 45–78. On 8 June 1990 one was in lowland hardwoods, on a nest that had been occupied the previous year by Red-shouldered Hawks, in Chisago County. A fledgling begged for food in upland hardwoods in 1986 (RM 40, WI).

American Kestrel.—R, pb. RM 75. Field, barrens. Found in June only at Sterling Barrens.

Ring-necked Pheasant.—R, pb. RM 47–56. Single birds recorded by Hudick at 4 of 50 survey stops between St. Croix Falls and Stillwater.

Ruffed Grouse.—FC, cb. RM 69–167. Black ash swamp, all upland forest types. Faanes noted a brood at Sterling Barrens (RM 76) in 1977.

Virginia Rail.—R, pb. RM 33, 172. Marsh. Found at Rice Lake Flats and Gordon Marsh.

Sora.—U, pb. RM 33, 172. Marsh. Rice Lake Flats and Gordon Marsh.

American Coot.—U, pb. RM 111, 172. Apparently breeds at Gordon Marsh. Found occasionally on the river.

Killdeer.—R, pb. RM 48–172.

Spotted Sandpiper.—C, pb. RM 25–166. Exposed riverbanks, mud bars, and low rocks, especially at or near riffles.

Table 5. North-south distribution of breeding birds counted along the St. Croix River, 1–10 June 1990.

Species	Number of individuals counted within indicated River Mile Interval					
	25–50	50–75	75–100	100–125	125–150	150–173
Northerly Distributions						
Yellow-bellied Sapsucker	—	2	—	6	7	3
Common Raven	—	1	3	2	4	4
Red-breasted Nuthatch	—	—	1	2	1	4
Winter Wren	—	3	—	1	4	2
Veery	—	2	2	8	12	17
Red-eyed Vireo	33	50	101	118	175	41
Golden-winged Warbler	1	6	4	7	8	16
Nashville Warbler	—	—	1	3	4	21
Northern Parula Warbler	—	—	—	3	1	20
Yellow Warbler	5	2	5	8	11	26
Chestnut-sided Warbler	—	—	3	18	13	20
Blackburnian Warbler	—	—	—	—	5	2
Black-and-White Warbler	—	1	1	6	5	13
Ovenbird	3	3	17	36	40	18
Northern Waterthrush	—	—	—	5	7	5
Mourning Warbler	—	1	5	11	14	6
Canada Warbler	—	—	2	16	11	7
White-throated Sparrow	—	—	—	—	1	7
Wide Distributions						
Eastern Wood-Pewee	31	20	5	24	28	9
Least Flycatcher	17	11	3	5	25	10
Great Crested Flycatcher	48	35	12	48	69	30
Black-capped Chickadee	17	3	3	2	6	6
American Robin	29	18	1	13	21	18
American Redstart	16	3	9	15	15	37
Scarlet Tanager	6	6	6	8	23	7
Rose-breasted Grosbeak	5	9	5	8	11	6
Indigo Bunting	7	10	3	8	5	2
Song Sparrow	145	58	52	93	109	56
Northern Oriole	46	17	2	6	21	26
Southerly Distributions						
Red-shouldered Hawk	9	6	5	4	1	—
Mourning Dove	13	6	5	—	—	—
Red-bellied Woodpecker	27	14	8	4	2	—
American Crow	15	9	9	25	7	—
White-breasted Nuthatch	15	12	4	6	5	5
Brown Creeper	18	7	3	5	9	1
Northern House Wren	38	20	—	—	1	—
Blue-gray Gnatcatcher	41	14	3	12	3	—
Wood Thrush	2	1	4	2	2	—
Yellow-throated Viero	15	12	7	5	9	9
Warbling Vireo	16	8	—	—	6	7
Cerulean Warbler	2	3	1	1	—	—
Prothonotary Warbler	61	5	—	—	—	—
Louisiana Waterthrush	7	5	2	5	6	—
Northern Cardinal	4	1	—	—	—	—
Brown-headed cowbird	31	10	7	6	5	1

Common Snipe.—U, pb. RM 79–173. Marsh, shrub swamp, black ash swamp, beaver meadow.

American Woodcock.—U, pb. RM 76–114. Shrub swamp, black ash swamp.

Caspian Tern.—R, ub. RM 25–45. River. Two on sandspit at Hudson on 4 May 1989. The 20 or more noted by Hudick within RM 25–45 during 23 June–3 July 1982 were obviously nonbreeders. Summer sightings are rare in western Wisconsin (Robbins 1991).

Black Tern.—U, cb. RM 168–173. Marsh, backwater, lake. Known to nest only in marshes on Gordon Flowage. At Gordon Marsh I estimated total breeding pairs at 17 in 1980, and 35 in 1990. In 1980 I recorded 3 nests and 2 additional chicks, and in 1990 I found 7 nests. Nests were among burreed, on the following substrates: burreed stems arranged radially by feeding muskrats (5 nests), mats of burreed detritus (3), log (1), and board (1). Hartman found 7 additional nests and 2 chicks in burreed marsh here on 30 June and 1 July 1990. On 2 June 1990 I located a colony of about 15 pairs on the west end of the flowage. Here birds defended potential nest sites on muddy mats where water was interspersed with thin stands of cattail, sedges, spikerush, *Scirpus americana*, and pond lilies.

Rock Dove.—U, pb. RM 25–56. Evidently nested in towns and under large bridges.

Mourning Dove.—FC, pb. RM 25–84. Lowland and upland hardwoods, sandbar, shrub terrace. Became suddenly rather common at about RM 84 (Table 5).

Black-billed Cuckoo.—FC, pb. Rm 40–172. Shrub swamp, all upland and lowland forest.

Yellow-billed Cuckoo.—U, pb. RM 32–135. Lowland and upland hardwoods. The most northern birds were in the northernmost of those lowland forests dominated by silver maple.

Great Horned Owl.—FC, cb. RM 31–80. Undoubtedly more widespread than these survey data indicate. I found a fledgling at RM 40 (WI) and in 1989 an adult was mobbed by crows and a Red-shouldered Hawk at RM 31.

Barred Owl.—C, pb. RM 36–166. Lowland and upland hardwood and mixed forest. Heard at most campsites.

Common Nighthawk.—FC, pb. 33–166. Like the Whip-poor-will and owls, this nocturnal and crepuscular species is more common than count data suggest. Many at night along RM 79–84.

Whip-poor-will.—FC, pb. RM 33–172. Heard at several campsites. Many called as I paddled RM 84 to RM 79 after dark on 6 June.

Chimney Swift.—U, pb. RM 39–132. Probably nests in chimneys, but possibly also in truncated, hollow trees in mature forest such as Farmington Bottoms.

Ruby-throated Hummingbird.—U, cb. Lowland hardwoods. On 10 June 1990 I found an adult on a nest, 4.5m up on a silver maple twig that drooped

Open silver maple sloughs and tip-up at Rice Lake Flats (*photo by M. J. Mossman*).

over a small river channel (RM 31, WI).

Belted Kingfisher.—FC, cb. RM 26–171. River, backwater, slough. I found several nest cavities during both canoe trips. At least some of these were obviously active, e.g., in a cutbank near a Bank Swallow colony (RM 69, WI), in a sandstone cliff by a Cliff and Bank Swallow colony (RM 29, WI), and in soil between 2 sandstone cliff faces (RM 99, WI).

Red-headed Woodpecker.—R, cb. RM 25–75. Lowland hardwoods. In Wisconsin this species usually nests in dead trees from which the bark has fallen. It probably increased in floodplain forests as Dutch elm disease killed most of the state's American elms between about 1960 and 1985. On the St. Croix River, most of these dead elms have now collapsed, which has probably caused a decline in Red-headed Woodpeckers. Surveys at the Sterling Barrens Natural Area recorded 1–2 birds in 1975 and 1977, but none since. At Interstate Floodplain Forest, Epstein found 2 Red-headed Woodpeckers, and a nest in a dead American elm on 6 June 1984, but the species was not recorded on surveys in 1989 or 1990. On the 1990 canoe survey I recorded it on the river only at about RM 30 in lowland hardwoods—it was far outnumbered by all other woodpecker species.

Red-bellied Woodpecker.—C, cb. RM 26–143. Lowland and upland hardwoods. This species increased southward (Table 5). At RM 110–143 it was rare, in silver maple-black ash and

swamp white oak-black ash woods. It became fairly common in lowland hardwoods below RM 80, and began to appear in upland forest below RM 55. Below RM 42 it was the most frequently recorded woodpecker species. On 9 June 1990 an adult fed nestlings in the truncated top of a live basswood, on the upland edge of Farmington Bottoms (RM 41, WI).

Yellow-bellied Sapsucker.—FC, pb. RM 50–172. Mixed upland and lowland forest, black ash swamp, upland and lowland hardwoods. This species was fairly common above RM 105, and uncommon downstream (Table 5). Interestingly, it becomes common in lowland hardwoods farther south along the Mississippi River, especially in association with river birch (*Betula nigra*), a species that does not reach as far north as the St. Croix (Mossman 1988).

Downy Woodpecker.—C, cb. RM 25–172. All forest and forest edge. An adult fed nestlings at RM 41 (WI) in a dead limb of a live silver maple.

Hairy Woodpecker.—FC, cb. RM 25–168. All forest types. During 3–9 June 1990 I recorded 12 active nests, within RM 45–158, in the following substrates: live silver maple (6), live black ash (3), dead black ash (1), dead silver maple (1), dead basswood (1).

Northern Flicker.—FC, cb. RM 25–168. Open woods of all types. An adult fed nestlings in a large, dead, truncated tree at RM 41 (WI). During the 28 April–4 May canoe survey, flickers were more vocal, and consequently many more were recorded, than during the June trip.

Pileated Woodpecker..—FC, pb. RM 25–170. All forest types, especially where extensive and mature. A pair exchanged at an apparent nest in a large dead tree at the Stillwater waterfront on 4 May 1989.

Olive-sided Flycatcher.—R, qb. RM 76, 99. Faanes (1981) found that this species occurred during the breeding season in extensive conifer swamps along the river in Burnett, Douglas, and Pine counties. The 2 birds noted in Table 2 were in unlikely breeding habitat farther south, on 7 June 1984 and 6 June 1990. They were apparently late migrants.

Eastern Wood-Pewee.—C, pb. RM 25–172. All forest types, including mature pines and especially in lowlands dominated by swamp white oak.

Yellow-bellied Flycatcher.—R, pb. RM 160. Faanes (1981) suggested that this species nests in conifer swamps along the river near Gordon. I located 1 singing bird on an island in marginally suitable breeding habitat of spruce, poplar (*Populus* spp.), white birch, white cedar, fir, and black ash. This was near Buckley Creek, where appropriate conifer swamp habitat occurs.

Alder Flycatcher.—FC, pb. RM 98–172. Shrub swamp, upland shrub; open, shrubby black ash swamp and lowland hardwoods.

Least Flycatcher..—C, pb. RM 27–172. Upland and lowland hardwood and mixed forest, with highest numbers in silver maple-black ash woods. Scattered along this entire stretch of river, not in loose "colonies" as it of-

ten is in much of its breeding range. In some sites it occurred in patches of pole-sized silver maple or other hardwoods.

Eastern Phoebe.—FC, cb. RM 27–172. Near nest sites at river edge, forest opening, slough, and sometimes forest of any type. Active nests were found under the eave of a cabin (RM 167, WI), beneath the roof of an informational sign (RM 119, MN), under a concrete bridge (RM 152, WI), atop a sandstone cliff under overhanging tree roots and soil (RM 99, WI), and under a natural rock overhang on a basalt cliff at the Dalles (RM 55, WI). Jackson (1942) also found phoebes nesting at the Dalles in 1919.

Great Crested Flycatcher.—A, pb. RM 26–172. All mixed and hardwood forest and forest edge, especially black ash swamp and lowland hardwoods. One pair appeared to be nesting in a Wood Duck nest box along Gordon Flowage.

Eastern Kingbird.—FC, pb. RM 26–172. Open-canopied woods, especially lowland; river edge, slough. They often sallied for prey from exposed perches, over channels and in large spaces among trees and snags.

Purple Martin.—R, pb. RM 25–131. River. Probably nests in artificial martin houses at cottages and in towns. Jackson (1942) found it nesting in St. Croix Falls in 1919.

Tree Swallow.—A, cb. RM 25–172. River, slough, backwater, over lowland forest and shrub swamp. Along with Barn Swallows, they often fed over or just below rapids and riffles. Active nests in snags were too numerous to note. Migrant tree swallows were especially abundant above RM 150 during 28 April–1 May 1989, when I also saw cloud-like flocks over Gordon Flowage.

Northern Rough-winged Swallow.—C, cb. RM 25–166. River, backwater, and slough, especially near potential nest sites. Nesting was suspected in many sites, but was confirmed in 1990 only at the following: 12 nests (at least 6 with eggs) in cavities of 2 sandstone cliffs, the nests lined with white pine needles and sometimes also with tiny twigs, herbaceous stems, or oak leaves (RM 91, WI, 6 June); 2 fresh excavations in a cutbank (RM 78); 2–5 pairs nesting at a Bank Swallow colony (RM 69, WI); about 7 nests in a cutbank (RM 54, WI); 2 nests destroyed among the roots of a large tip-up, possibly preyed upon by a large fox snake, also found among the roots (RM 50, WI); at least 10 nests, with Cliff Swallow nests, in a sandstone cliff (RM 46, WI); undetermined number of nests on sandstone cliffs (RM 28–29, WI). Rough-winged and Cliff Swallows were common at St. Croix Falls in 1919 (Jackson 1942).

Bank Swallow.—U, cb. RM 28–152. River and slough, especially near colonies. Three active colonies were noted in 1990: 15–20 nests in a cutbank (RM 69, WI); undetermined number of nests in sandstone cliffs (RM 28–29, WI); 20–30 nests, with Cliff Swallow nests, on a sandstone cliff (RM 28, WI). Of the 73 birds counted on the 1990 canoe survey, 50 were at RM 28–29.

Cliff Swallow.—FC, cb. RM 28–166. River, especially near colonies. In June

Mature lowland hardwoods at Farmington Bottoms (*photo by M. J. Mossman*).

1990 I recorded 7 colonies: 3–5 incomplete nests under Scotts Bridge (RM 166, WI); 6 nests under Hwy T bridge (RM 158, WI); 8–10 nests under Hwy 35 bridge (RM 144, WI); 177 nests under Hwy 70 bridge (RM 97, WI/MN); 13 nests on cliffs (RM 53, WI/MN); at least 3 nests on sandstone cliff (RM 46, WI); 10–15 nests on sandstone cliff (RM 28, WI).

Barn Swallow.—FC, cb. RM 113–172. River, backwater, especially near buildings and small bridges. This species' northerly distribution on the river corresponds with the locations of small bridges under which it nests. Barn swallows also probably nest on buildings. I located 8 nests under the Hwy 53 bridge in 1988 (RM 173, WI), and in 1990 I found 5–10 nests each in 3 Cliff Swallow colonies at Scotts, Hwy T, and Hwy 35 bridges.

Blue Jay.—C, cb. RM 39–172. All forest types and edges, especially in uplands. A pair was nest building in a red oak (RM 113, WI), and I found a dead nestling (RM 99, WI).

American Crow.—C, cb. RM 25–146. All forest types, edge, river, slough. Fledglings were at RM 40 on 30 June 1986.

Common Raven.—U, cb. RM 70–172. Mixed upland and lowland forest, pine woods, edge. On both canoe trips this species occurred only as far south as Nevers Dam. Young begged for food in June 1990 (RM 99, 135 WI).

Black-capped Chickadee.—FC, cb. RM 26–172. All forest types, edge. Adults fed nestlings (RM 50, WI) and recently fledged young (RM 31, 40 (1986), 50, WI).

Red-breasted Nuthatch.—U, pb. RM 97–173. Mixed upland and lowland forest, pine forest, barrens. This species prefers conifers, and has a correspondingly northern distribution on the St. Croix (Table 5). I found its southern limit at RM 97–99 on both canoe trips, although it may sometimes occur farther south in pines at Sterling Barrens or the Dalles.

White-breasted Nuthatch.—C, cb. RM 26–173. All forest types, especially large, mature tracts of lowland hardwoods. An adult fed a fledgling (RM 31, WI), and another fed nestlings in a former woodpecker cavity of a green ash (RM 40, WI). Although it occurred throughout the study area, it was most abundant by far in the extensive hardwood bottoms below RM 55 (Table 5).

Brown Creeper.—C, cb. RM 26–166. Lowland hardwood and mixed forest, black ash swamp, sometimes upland forest. Although this species has a generally northern breeding distribution in the Midwest, it is common in extensive mature lowland hardwoods at least as far south as the Wisconsin-Illinois border (Mossman 1988). Its maximum abundance at RM 25–55 on the St. Croix (Table 4) reflects its apparent preference for this habitat type. A pair was building a nest at the height of 1.5 m, under bark peeling from a snag, in a silver maple-black ash swamp (RM 136, WI). Faanes (1981) and Janssen (1987) had found no direct evidence of nesting along the St. Croix.

Northern House Wren.—C, pb. RM 25–62, 75, 145. Lowland hardwoods, sometimes upland hardwoods; St. Croix Dalles, edge. Although this species' breeding range extends well to both the north and south of the St. Croix, it had a very southern distribution on the river (Table 5), where it was common to abundant in lowland hardwoods. It became suddenly common below RM 55. Farther upstream it was absent from apparently suitable habitat, i.e., lowland hardwoods with sloughs, deadfalls, piles of tree limbs, and woody detritus. However, its breeding populations may fluctuate dramatically between years: at Farmington Bottoms I recorded 0 in 1986 and 10 in 1990; at Interstate Floodplain Forest observers counted 7 in 1984, 27 in 1989, and 8 in 1990.

Winter Wren.—U, cb. RM 52–55, 113–167. Mixed lowland forest, sometimes lowland hardwoods (above RM 113); rocky, mixed upland forest (RM 52–55) (Table 5). On the upper St. Croix this species prefers its typical northern Wisconsin breeding habitat of mixed, wet-mesic forest, especially with white cedar. Along the lower St. Croix, it breeds in the same sort of rocky, mature hardwood or hardwood-pine forest to which it is largely limited south of the tension zone (e.g. Mossman and Lange 1982). Its occasional occurrence in lowland hardwoods of the upper river may reflect "spillover" from nearby mixed forest as well as a lack of competition from house wrens, which are typical of this forest type below RM 55. Bratlie (1976) reported a nest along Lawrence Creek near RM 53.

Marsh Wren.—U, pb. Marsh. It occurred in burreed or cattail at Rice

Lake Flats, Cedar Bend, and Gordon Marsh.

Sedge Wren.—R, pb. Marsh, beaver meadow.

Blue-gray Gnatcatcher.—C, cb. RM 26–145. Lowland hardwoods, southward also in upland hardwoods. Above RM 125 it occurred sparingly in silver maple-black ash, and swamp white oak-black ash. Below this its abundance was roughly correlated with the extent of lowland hardwoods (Table 5). Its regular breeding range along the river thus extends considerably higher than indicated by Faanes (1981), Janssen (1987), and Robbins (1991). An adult fed a fledgling on 30 June 1986 (RM 41, WI), and Maurer (1970) noted a family on the Minnesota side at about RM 41. Faanes (1981) summarized evidence that gnatcatchers have increased along the St. Croix and its tributaries. Its range may be continuing to expand northward.

Eastern Bluebird.—U, cb. RM 26–125. Slough, beaver meadow, open river terrace, oldfield, campground, gasline swath. They foraged in openings, and sometimes beneath a sparse canopy of lowland hardwoods. There was an active nest in a large rotten snag along a slough (RM 41, WI).

Veery.—C, pb. RM 69–173. Black ash swamp, shrub swamp, lowland mixed and hardwood forest. This northerly-distributed thrush (Table 5) occurred mostly in rather open-canopied, shrubby, lowland forest. Jackson (1943) found them "common in the timber at St. Croix Falls" in 1919.

Hermit Thrush.—R, pb. RM 95, 167. Mixed lowland forest. Probably more common than count data suggest, due to the dearth of time spent in the favored habitats of lowland coniferous forest and pine barrens.

Wood Thrush.—U, pb. RM 26–152. Lowland and upland hardwoods. Wood Thrushes were widely scattered, mostly in woods with moderate canopy cover and a well developed sapling layer: northward mostly in silver maple-black ash and swamp white oak woods, and southward in uplands rather than the wet, open-understory silver maple bottoms.

American Robin.—C, cb. RM 25–173. All forest types and edges, upland and lowland shrubs. Most common in black ash swamps, along sloughs, and at the border of forest and river. They were often found near puddles in old river sloughs. A pair was nest-building in a silver maple overhanging the river (RM 115, WI).

Gray Catbird.—FC, pb. RM 42–173. Shrub swamp, open shrubby lowland and upland forest and edge, upland and river terrace shrubs.

Brown Thrasher.—U, pb. RM 26–130. Upland and lowland shrubs, pine barrens.

Cedar Waxwing.—A, pb. Rm 25–173. All forest, edge, and shrub habitats, river, slough, beaver meadow. Waxwings were nearly ubiquitous except in closed-canopy forest, often hawking insects in large spaces above, below, and within the tree canopy, and over slough, river, and shrubs. Most

were still in flocks during the early June survey.

European Starling.—R, pb. RM 25–57. Town, lowland hardwoods. This cavity-nester may have declined in lowland hardwoods since the collapse of most dead elms. For instance, at Interstate Floodplain Forest observers counted 6 starlings in 1984, but none in 1989 or 1990.

Yellow-throated Vireo.—C, pb. RM 26–173. All hardwood and mixed forest. Most abundant in the mature, extensive lowland hardwoods of the lower river (Table 5). In 1919, Jackson (1943) found "a few. . .in the deciduous timber at St. Croix Falls. . .where they were probably nesting."

Warbling Vireo.—FC, pb. RM 25–135. Open-canopied hardwood and sometimes mixed forest, woods edge, especially lowland. It was most common in mature floodplain hardwoods dissected by extensive sloughs or river channels. In May 1989 I found 2 of the previous year's nests. Noted along the river at St. Croix Falls in 1919 (Jackson 1943).

Red-eyed Vireo.—A, cb. RM 26–173. All forest, especially hardwoods. This was easily the most abundant and widespread bird of hardwood and mixed forest above RM 75 (Table 5). Southward it became less common and less generalized in distribution, being more limited to relatively mature, closed-canopy, interior forest sites. A pair was building a nest in a silver maple, over a slough (RM 143, WI).

Blue-winged Warbler.—U, pb. RM 54–75. Shrubby openings in pine-oak barrens, bluffside oak forest, and wet-mesic forest of silver maple, black ash and basswood.

Golden-winged Warbler.—FC, pb. RM 45–173. Shrub swamp, shrubby sites in all lowland and upland hardwood and mixed forest, especially black ash swamp. Uncommon below RM 55 (Table 5). Jackson (1943) found them common along the river at St. Croix Falls in 1919.

Nashville Warbler.—FC, pb. RM 97–170. Mixed lowland and upland forest, especially with spruce or fir; jack pine barrens. Common above RM 152 (Table 5).

Northern Parula Warbler.—FC, pb. RM 106–168. In upland or lowland woods containing spruce-fir or white cedar, most often in black ash-spruce woods. Two birds were in lowland hardwoods. It apparently breeds farther south here than shown by the Janssen (1987) and Robbins (1991) maps.

Yellow Warbler.—C, pb. RM 32–173. Shrub swamp, shrubby lowland hardwood and mixed forest and edge, beaver meadow, shrubby river terrace. Restricted below RM 70 to open stands of silver maple. Its northerly distribution on the river (Table 5) reflects the greater extent northward of shrub swamp and low, open-canopied woods with many shrubs and saplings.

Chestnut-sided Warbler.—C, pb. RM 75–173. Shrubby upland and lowland hardwoods or mixed forest; often in black ash-alder, or shrubby swamp white oak woods. Seldom in silver ma-

ple forest. Often associated with Golden-winged Warbler.

Cape May Warbler.—R, qb. RM 118. In spruce-fir of St. Croix Cedar Swamp Natural Area (Table 2).

Yellow-rumped Warbler.—R, pb. RM 105–108. Mixed upland forest of hardwoods, white pine, and sometimes spruce-fir. Was an abundant migrant along the river during the 1989 canoe survey. May also occur in conifer-dominated swamps such as on Buckley Creek, above RM 160.

Black-throated Green Warbler.—R, pb. RM 118. Mixed forest dominated by white cedar or by spruce-fir-black ash. Recorded only on a 1980 survey in the St. Croix Cedar Swamp Natural Area (Table 2).

Blackburnian Warbler.—U, pb. RM 135–166. Black ash-spruce forest, mixed upland forest.

Pine Warbler.—U, pb. RM 55–170. In mature pines, including mixed forest, pine woods, and St. Croix Dalles. Eight of the 13 birds recorded were in the red pine woods at Sand Rock Cliffs (RM 99, WI). An adult repeatedly gathered and carried food in a large white pine (RM 107, WI). Jackson (1943) also found this species in white pines at St. Croix Falls, in 1919.

Cerulean Warbler.—U, pb. RM 40–106. Extensive tracts of mature lowland hardwoods. This species, considered threatened in Wisconsin, is a good indicator of intact, mature southern floodplain forest, occurring in this habitat even at its northernmost extent, such as along the St. Croix (Mossman 1988). On the 1990 canoe survey, it was not recorded until I reached the northernmost, substantial stand of mature lowland hardwoods, along the Kettle River (RM 106, MN), where a male sang from the canopies of 21–23 m tall black ash and swamp white oak. The next site southward was found in 1980, when 3 sang from the canopies of the tallest (20–23 m) black ash in the St. Croix River Swamp Hardwoods Natural Area (RM 93, WI). These birds were north of the range limits described by Faanes (1981), Janssen (1987), and Robbins (1991). In 1990, I encountered others in Minnesota at RM 77, and in Wisconsin at Interstate Floodplain Forest (RM 53), Cedar Bend (RM 45), and Farmington Bottoms (RM 40) (Tables 2,5). Although the upper St. Croix evidently represents the northernmost extent of this species' regular breeding in Wisconsin and Minnesota, it is noteworthy that the first Wisconsin nest records to be published were from the same approximate latitude, 80 km to the east (Southern 1962).

Black-and-White Warbler.—FC, pb. RM 68–173. Mixed upland and lowland forest, occasionally in lowland hardwoods with many shrubs and saplings.

American Redstart.—C, pb. RM 26–173. All mixed and hardwood forest, in edges and areas with moderate shrub and sapling growth. For example, in the more southern silver maple bottoms, they often occurred under old, partially re-closed canopy gaps where saplings had grown to a height of 3–6 m.

Prothonotary Warbler.—C, cb. RM 26–52. Lowland hardwoods, near

sloughs or flooded timber. The species appeared quite suddenly at Peaslee Bottoms (Tables 2, 5). The northernmost bird seemed unmated, but the next kilometer revealed 2 more territories, both with active nests, and birds were met with increasing frequency in suitable habitat southward. Hudick (pers. comm.) also considers Peaslee Bottoms to be the species' northernmost location on the river. My most northerly sighting on the Minnesota side was RM 49. These are apparently the northernmost breeding-season sites in either state. Hubert (1945) also found prothonotaries as far north as RM 49, and he located 11 singing males and 5 nests or families between approximately RM 25 and RM 38. Maurer (1970) reported adults feeding a fledgling at about RM 41 (MN), and I saw the same at RM 40 (WI) on 30 June 1986. Hartman and I found 8 active nests in 1990 (Table 6).

Ovenbird.—C, pb. RM 35–170. All upland forest types; in lowland forest, fairly common in "wet-mesic" sites dominated by swamp white oak but uncommon in black ash forest and very uncommon in low, silver maple forest.

Northern Waterthrush.—FC, pb. RM 100–167. Wet pockets in black ash swamp and sometimes other lowland mixed or hardwood forest, especially where tree tip-ups provide potential nest sites.

Louisiana Waterthrush.—FC, cb. RM 26–143. Hardwood or mixed forest of steep slopes, small glens, and lowland hardwoods, almost always at or near springs or spring runs. This northern finger of the Louisiana Waterthrush's breeding range has been known for many years. During 1918–1919, for example, it was rare at its northernmost known localities (RM 114, 123, 132–140, MN) (Roberts 1932). It was not recorded this far north again until 1980 (near RM 120, MN) (Loon 53:144) and 1983 (Lower Tamarack River near RM 132, MN) (Zumeta and Cinotta 1983). In 1908 "hundreds" occurred along both banks of the St. Croix as far north as RM 56, and adults were seen feeding fledglings at about RM 41 (MN). In 1927 the species was still common between RM 25 and 56, where fledglings were again reported (MN) (Roberts 1932). Single Minnesota nests were found in 1943 near

Table 6. Prothonotary Warbler nests on the St. Croix River, 1990.

Date	RM	State	Contents or activity	Nest height (m)	Substrate	
					Height (m)	Type
8 June	52	WI	building	1.0	1.2	rotten Am. elm stub
8 June	51	WI	building	2.4	3.4	dead Am. elm stub
9 June	41	WI	5P eggs[1]	2.3	2.4	rotten stub
9 June	35	WI	6P+1C eggs	0.6	1.4	rotten stub
10 June	31	WI	building	1.5	—	limb of live, tipped silver maple
10 June	29	MN	5P+2C eggs	0.9	1.7	rotten stub
10 June	29	MN	4P eggs	1.7	7.6	dead silver maple stub
10 June	27	WI	on nest	1.8	2.4	rotten stub

[1]P = Prothonotary Warbler, C = Brown-headed Cowbird.

Stillwater (Flicker 16:13), in 1945 in Washington County (Flicker 17:86), and in 1973 and 1974 along Lawrence Creek 1–2 km from the St. Croix near RM 53 (Langley 1973, Faanes 1981). On an island near RM 27 (MN), W. Longley saw an adult feed a cowbird in 1947, and a nest being built in 1948 (MDNR, unpubl.). In 1975, Faanes (1981) found a nest along a tributary near Hudson (RM 18, WI). In 1988, Eliason and Fall (1989) documented 10 territorial males along the river and adjacent stretches of tributaries, within RM 25–45 (MN), and another farther downstream. They found a nest near RM 45. In 1990 the Minnesota County Biological Survey found this species at 12 sites along the St. Croix in Chisago County (Strucker and Nordquist in prep.).

My canoe surveys revealed 20 singing males in 1989 (RM 27–125) and 25 in 1990 (RM 27–143). In 1990, 18 of these were in Wisconsin, and 13 were above RM 84 (Table 5). Eleven of the 1989 territories were far from those found active in 1990, and some of them were probably active but simply overlooked in 1990. Of the total of 22 active territories located by MDNR in Chisago and Washington counties in 1988 and 1990, only 2 duplicated those that I found. Thus, the number of breeding territories above RM 25 is certainly at least 56 and probably at least 70.

On 10 June 1990, Hartman and I found a nest containing 4 waterthrush nestlings, built into soil, leaf litter, and the roots of a fallen sugar maple sapling, at the top of a shady, liverwort-covered sandstone cliff 2 m high (RM 29, WI). It was in a small, steep glen approximately 25 m long and broad, with a small stream, a tall canopy of basswood and sugar maple, and a rich ground layer that included ginger (*Asarum canadense*), wood nettle (*Laportea canadensis*), hog-peanut (*Amphicarpa bracteata*), spikenard (*Aralia racemosa*), maidenhair fern (*Adiantum pedatum*), and miterwort (*Mitella diphylla*). The same day we found a fledgling unable to fly well (RM 27, WI), attended by an adult, in a riverside thicket of Canada yew (*Taxus canadensis*), red-berried elder (*Sambucus pubens*) and jewelweed, at a seepy slope below a sandstone cliff.

Mourning Warbler.—FC, pb. RM 70–172. Shrubby lowland forest—usually mixed hardwood-coniferous but also swamp white oak or black ash-alder; occasionally in shrubby upland forest openings.

Common Yellowthroat.—A, pb. RM 25–173. Openings and edges of all lowland forest types, shrub swamp, marsh, beaver meadow, occasionally shrubby uplands.

Canada Warbler.—FC, pb. RM 97–171. Mixed mesic upland forest, mixed lowland forest. Its range reaches slightly farther south than shown on Janssen's (1987) and Robbins' (1991) maps. It occurred primarily in deciduous understory of mixed upland and lowland forest, and disappeared with the southward disappearance of mixed forest (Table 5).

Scarlet Tanager.—C, pb. RM 26–172. All mixed and hardwood forest, especially with oaks or black ash.

Northern Cardinal.—U, pb. RM 26–57. Upland and lowland hardwoods, Dalles. On both canoe surveys I first

found this southern species at RM 55–57. On the June survey I recorded only 3 from here to RM 25, but on the early May survey they were more common, especially below RM 33.

Rose-breasted Grosbeak.—C, pb. RM 25–173. All forest. Widely distributed (Table 5).

Indigo Bunting.—FC, pb. RM 35–166. Open-canopied, shrubby woods, openings, and edges. Often in lowland forest openings resulting from the death of elms, with box elder and stinging nettle (*Urtica dioica*). It was widely distributed except in the northernmost stretch of the river (Table 5).

Rufous-sided Towhee.—U, pb. RM 75–115. Upland shrubs, barrens.

Chipping Sparrow.—FC, pb. RM 25–166. In pines of mixed upland and lowland forest, pine woods and barrens, Dalles; sometimes in mixed hardwoods-spruce-fir, and occasionally in lowland hardwoods devoid of conifers.

Field Sparrow.—U, pb. RM 70–80. Oldfield, barrens.

Song Sparrow.—A, cb. RM 25–173. Boundary between forest and river or slough; shrub swamp, riverside terrace, shrubby lowland forest, beaver meadow. An adult flushed from a nest containing 5 eggs, located on a riverbank in reed canary grass (RM 67, WI).

Swamp Sparrow.—FC, pb. RM 44–173. Shrub swamp, cattail marsh, occasionally in black ash-alder woods and lowland forest edge.

White-throated Sparrow.—U, pb. RM 146–170. Mixed lowland forest.

Red-winged Blackbird.—A, cb. RM 32–173. Marsh, shrub swamp, grassy or shrubby edges of river, lake, and slough, beaver meadow, occasionally in large openings of lowland forest. This was about the only species to breed in riverine marshes such as McLeod's Slough. One active nest was recorded.

Yellow-headed Blackbird.—FC, pb. RM 33–172. Marsh. Locally common to abundant in cattail, burreed, cane, and river bulrush, at 4 sites (Table 1): Gordon Marsh, NW Gordon Flowage, Cedar Bend-North, and Rice Lake Flats.

Common Grackle.—C, cb. RM 25–170. Banks of river and slough, marsh, forest edge, narrow strips of forest. Most common below RM 38. A pair attended an active nest 10 m up in a white spruce at a former cottage site (RM 158, WI).

Brown-headed Cowbird.—C, cb. RM 25–166. All habitats, especially forest edge, and hardwood forest. Rare in the north, and increasingly common southward (Table 5). These brood parasites probably fed in nearby agricultural areas, but I also saw them feed beneath a semi-open canopy of lowland hardwoods. Cowbirds had parasitized 2 of 4 Prothonotary Warbler nests that held eggs (Table 6).

Northern Oriole.—C, cb. RM 25–172. Open-canopied forest and forest edge, especially among mature trees of lowland hardwoods, hence its high abundance below RM 50 (Table 5). I

noted 2 active nests in silver maples at RM 47 (MN) and 137 (WI).

Purple Finch.—R, pb. RM 153–167. Mixed forest. Fairly common during the April/May trip, but found only at 2 sites during the June survey. Jackson (1943) suspected nesting at St. Croix Falls in 1919.

American Goldfinch.—C, pb. RM 25–173. Shrub swamp, all forest types (especially when open-canopied), forest edge.

Evening Grosbeak.—R, qb. RM 166. Heard overhead at just one site.

House Sparrow.—U, pb. RM 25–56. Towns. None were recorded on formal counts.

Domestic Species.—The geese and peacocks (Table 2) were of unknown origin, but had undoubtedly escaped captivity.

Additional Notes on Migrants

Horned Grebe, Red-necked Grebe, Green-winged Teal, American Black Duck, Northern Shoveler, American Wigeon, Lesser Scaup, Bufflehead, Northern Harrier, Merlin, Sandhill Crane, Greater Yellowlegs, Solitary Sandpiper, Bonaparte's Gull, Ring-billed Gull, Herring Gull, Ruby-crowned Kinglet, Palm Warbler, Tree Sparrow, Rusty Blackbird, Pine Siskin were additional species recorded on the canoe trip of 28 April–4 May 1989 (RM 20–173). Possible breeders on this list include the crane, teal, black duck, shoveler, harrier, Merlin, and siskin. I also saw 5 White Pelicans at RM 40 (WI) during an aerial survey on 20 November 1990.

Other Fauna

Amphibians.—Spring peeper (*Pseudacris crucifer*), American toad (*Bufo americanus*), green frog (*Rana clamitans*), and eastern gray treefrog (*Hyla versicolor*) were heard regularly from Gordon to at least Rice Lake Flats during either the 1989 or 1990 canoe trip. Chorus frog (*Pseudacris triseriata*) and leopard frog (*R. pipiens*) were less frequent. I recorded mink frog (*R. septentrionalis*) and Cope's gray treefrog (*H. chrysoscelis*) only from the Gordon Marsh. At this site *chrysoscelis* were in shrub swamp while *versicolor* were near or among trees. The latter species was abundant, calling from both sides of the river as I paddled after dark from RM 84 to RM 79. I encountered bullfrogs (*R. catesbeiana*) from RM 35 to RM 28. Wood frogs (*R. sylvatica*) undoubtedly occur along the river, but I was not present during their breeding season.

Reptiles.—At RM 50 I found a 1.5 m long fox snake (*Elaphe vulpina*) among the upturned roots of a fallen tree, where it may earlier have destroyed 2 nests of Northern Rough-winged Swallows. Very few turtles were active during the 1989 canoe trip, but on the 1990 trip I saw many. Painted turtles (*Chrysemys picta*) were fairly common throughout, as were map turtles (*Graptemys* spp.) below RM 97. A snapping turtle (*Chelydra serpentina*) was laying eggs on a sandbar at RM 45 on 9 June 1990. The first softshell turtles (*Trionyx* spp.) were seen at RM 140; they were commonly found basking on rocks and riverbanks from RM

60 to RM 135, and were less common downstream. Of several identified by sight, all were the spiny softshell (*T. spiniferus*), except for one probable smooth softshell (*T. muticus*) in Burnett County. Hartman found a Blanding's Turtle (*Emydoidea blandingi*) at Gordon Marsh on 30 June 1990.

Mammals.—I recorded the following species, all of which appeared to be fairly common on at least certain stretches of the river: woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*S. niger*), red squirrel (*Tamiasciurus hudsonicus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), porcupine (*Erethizon dorsatum*), coyote (*Canis latrans*), black bear (*Ursus americanus*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), river otter (*Lutra canadensis*), and white-tailed deer (*Odocoileus virginianus*).

Discussion

From Gordon to Stillwater, the St. Croix River and its immediate corridor harbor at least 128 species of breeding birds, and perhaps as many as 155. A more thorough inventory and evaluation of this avifauna is advisable. However, the information presented in this paper is sufficient to suggest this avifauna's most significant attributes, and the habitat features responsible.

At least 8 species of critical status breed on the St. Croix (Table 3). The American Bittern occurs in marshes, shrub swamps, and probably meadows, especially at Gordon Marsh—sites that should be protected from degradation. Great Egret, Osprey, Bald Eagle, and Red-shouldered Hawk are all probably present due to the relatively low level of human disturbance, the extent, continuity and relative purity of feeding habitat, and a fairly intact prey base, particularly fish and amphibians. Further protection of nest sites and potential nest sites is warranted, especially within RM 25–55, where human disturbance may limit nesting populations of egrets, ospreys, and eagles. In addition, red-shoulders require extensive tracts of lowland and bluffside forest. Ospreys can be encouraged by artificial nest-platforms.

In Wisconsin, Great Egret colonies appear stable only in large, well established Great Blue Heron rookeries, and usually in stands of large trees isolated from disturbance. Yet, since nesting trees eventually die of senescence and the effects of guano, colonies generally remain established only when other suitable nesting sites occur nearby. Thus, care should be taken to provide appropriate habitat beyond current rookery boundaries. The presence of nesting and nonbreeding Trumpeter Swans on the St. Croix is due to nearby reintroductions, but also to certain qualities of the river. Swans are probably encouraged to establish residency by springs and currents that provide open water through much of the winter. The river corridor is relatively free of hazards such as powerlines and spent, lead shot. A few isolated backwaters occur where swans can undergo their summer molt and even nest apart from human disturbance, and where separation from the flushing effect of active channels encourages the growth of diverse submergent and emergent vegetation upon which the birds feed.

Trumpeter Swans, especially those released in restoration programs, for various reasons tend to be unafraid of

people. Although this allows birds to coexist with human use on the river, it can also encourage harassment, dependence on hand-outs, and illegal hunting. An educational effort is needed.

Another potential nesting area for Trumpeters on the St. Croix is at Gordon Flowage, either through direct reintroductions or natural establishment from continuing restoration efforts nearby in Wisconsin and Minnesota. This may necessitate control of the feral Mute Swan population there, but first it would be wise to determine the breeding success of that population and why it seems to be so poor.

Along the St. Croix, the Cerulean Warbler is dependent on extensive tracts of mature lowland hardwoods, and the advisability of maintaining such tracts is clear. Additional habitat could be provided by allowing other hardwood forest tracts to mature, either in lowlands such as Peaslee Bottoms, or in uplands that are adjacent to suitable lowland forest. Although historical accounts suggest that Louisiana Waterthrushes have declined on the St. Croix over the past 80 years, the breeding population remains substantial. The species requires clean, forested springs, spring runs, or streams, although individuals may also forage along adjacent sloughs. It probably also relies on factors such as soil and litter development, substrates, and nearby vegetation, which may be responsible for the productive and diverse aquatic arthropod communities on which it seems to depend for food. To maintain breeding populations on the St. Croix it is advisable to protect springy bluffsides and glens from logging, development, or other factors that might pollute or restrict spring flows or disturb streamside vegetation or substrates. Because Louisiana Waterthrushes are subject to brood parasitism by Brown-headed Cowbirds, forests should be protected from fragmentation near breeding areas.

The St. Croix River spans the tension zone between hardwood and mixed hardwood-coniferous forest biomes, and the river's breeding avifauna reflects the mingling of northern and southern forest bird communities described elsewhere (Temple et al. 1979, Mossman 1988, Hoffman 1989, Mossman and Hoffman 1989, Mossman et al. 1990, Hoffman and Mossman 1990). Thus it is no surprise that many breeding-bird species reach the northern or southern limits of their normal breeding range at various points along the river (Table 4). The limited data set reported here suggests that the following species reach their northern limits at the indicated river miles: Prothonotary Warbler (52), Northern Cardinal (57), Great Egret (70), Blue-winged Warbler (75), Cerulean Warbler (106), Yellow-billed Cuckoo (135), Red-shouldered Hawk (143), Red-bellied Woodpecker (143), Louisiana Waterthrush (143), Blue-Gray Gnatcatcher (145). Most of these species occur primarily in lowland hardwoods, and are very characteristic of this forest type farther south in Wisconsin. Their northern limits here appear to be correlated with the diminution of this forest type and its replacement by mixed forest. For some of these species additional factors are probably important as well, i.e. competition between Blue-winged Warbler and the more northerly-distributed Golden-winged Warbler, winter snow cover and the availability of backyard

feeders for Northern Cardinal, and the abundance and nature of springs, spring runs, and rocky streams for Louisiana Waterthrush.

A few other species show a definite, southerly distribution on the St. Croix, even though their normal breeding range extends farther north (Table 5). For the White-breasted Nuthatch, Wood Thrush, Yellow-throated Vireo, and Warbling Vireo, this reflects a rangewide preference for hardwoods. Species such as Mourning Dove, American Crow, and Brown-headed Cowbird do best in mosaics of open and forest habitats and their southerly distributions on the river represent increasing forest cover northward. Although the breeding distributions of Northern House Wren and Brown Creeper are not particularly "southern" in the Midwest, they exhibited such a trend on the St. Croix. This is explained by their characteristically high abundance in mature lowland hardwoods. However, the near absence of house wrens in apparently suitable habitat above RM 55 is peculiar.

The following northern species appear to reach their normal southern extents here as well (Table 5): White-throated Sparrow (146), Blackburnian Warbler (135), Black-throated Green Warbler (118), Northern Parula Warbler (106), Yellow-rumped Warbler (105), Northern Waterthrush (100), Alder Flycatcher (98), Red-breasted Nuthatch (97), Nashville Warbler (97), Canada Warbler (97), Common Merganser (83), Mourning Warbler (70), Common Raven (70), Pine Warbler (55), Winter Wren (52). Most of these reflect the disappearance southward of mixed forest. For Northern Waterthrush, Alder Flycatcher, and Mourning Warbler, other structural changes in the forest and its substrate may be operative, especially the disappearance of black ash-alder swamp. Extent of forest cover is undoubtedly an additional factor for Common Raven. Common Mergansers are probably limited by the disappearance of riffles and rapids, and increased human disturbance. Of other species with northerly distributions, several are probably affected by changes in forest structure and the disappearance of black ash-alder swamps (Veery, Golden-winged Warbler, Yellow Warbler, Chestnut-sided Warbler, Black-and-White Warbler). The Yellow-bellied Sapsucker may be affected by the reduced importance of birch and aspen; they increase again farther south in Mississippi River bottoms, where river birch appears. The distribution of Red-eyed Vireos and Ovenbirds on the St. Croix mirror their ubiquity and abundance in the hardwood and mixed forests north of the tension zone, and their reduction to "common" and "fairly common" status in southern Wisconsin floodplain forest, where both prefer wet-mesic over wet forest.

Species without obvious northerly or southerly distributions along the river (Table 4), are generally known to breed commonly in both hardwood and mixed forests in the Midwest, but with a general preference for hardwoods over conifers.

The results presented here confirm many of the range limits mapped by Janssen (1987) and Robbins (1991), but indicate extensions for several species. These include Common Merganser, Winter Wren, Blue-Gray Gnatcatcher, Northern Parula Warbler, Cerulean Warbler, Louisiana Waterthrush, and Canada Warbler.

As the foregoing discussion suggests, this nearly continuous, relatively undisturbed forest corridor spanning the tension zone provides unique opportunities for the study of range limits and their causative factors; and for monitoring population shifts and trends, which may be especially noticeable at the edge of a species' range. In particular, it is almost ideal for detecting early effects of climatic changes such as global warming on the distribution of plant and animal species.

Altogether, the St. Croix River is significant within the Midwestern region for its breeding populations of a large number of both northern and southern forest and wetland species, including at least 8 species of critical status. Furthermore, these species appear to be an integral part of a relatively large, intact ecosystem comprising a number of high quality plant-animal communities. Essential characteristics of this ecosystem are its continuous nature, large size, relative lack of disturbance, and a variety of site and probably climatic factors that produces a high diversity of community types. Any activities or policies that could compromise these qualities should be scrutinized.

Sites worthy of special protection or management, and which are not already incorporated into State Natural Areas, include 3 marsh complexes (Gordon, Cedar Bend, Rice Lake Flats), and several large tracts of lowland hardwoods (Peaslee, Cedar Bend, Kettle River, Farmington). There are no large blocks of upland hardwoods protected along the lower river, and this would be an advisable addition. One such tract lies adjacent to Farmington Bottoms. Regardless of the need to provide public recreational opportunities on the river, human use of the lower St. Croix, especially between Stillwater (RM 25) and O'Brien State Park (RM 40), warrants greater control (particularly for speed boating), as well as more educational effort. This is needed to protect sensitive nesting species such as Great Egret, Great Blue Heron, Bald Eagle, Red-shouldered Hawk, and Trumpeter Swan, to minimize erosion of banks and cliffs, and to encourage a finer appreciation of the river and its unique natural features.

And finally, further biological inventories are needed on the river. This information will be necessary if state, federal and private agencies are to join in a renewed effort to evaluate the river as an ecosystem and ensure its longterm viability in the face of increasing, competing demands. Bird watchers can help by contributing significant observations to NPS, MNHD, or WDNR.

Despite what may need to be done yet on the St. Croix River, public agencies and private landowners have thus far protected an incredible resource here. If you have an interest in birds and in wild places, you will surely find it fascinating. Many interesting sites can be visited on foot at various state properties and access points. But for a fuller awareness of St. Croix birdlife, take your canoe, tent and binoculars, and disappear down the river for a few days.

Summary

The St. Croix River provides a natural, continuous, 300-km forest corridor that spans the tension zone between southern hardwood and northern mixed forest biomes. As

many as 155 species may breed in the immediate river corridor. Breeding-bird surveys between River Miles 25 and 173 produced a list of 134 species, of which breeding was confirmed for 50, and is probable for another 78. These include 8 species of critical status, and many that reach limits or show marked north-south distributions along the river. Southern species include Great Egret, Red-shouldered Hawk, Red-bellied Woodpecker, Louisiana Waterthrush, Cerulean Warbler, Prothonotary Warbler and Northern Cardinal; while northern species include Common Merganser, Common Raven, Northern Parula Warbler, Canada Warbler, Winter Wren, and others.

The St. Croix River corridor is an extensive, relatively intact ecosystem. Its significant characteristics include large, continuous tracts of fairly mature forest, a relative lack of pollution and human disturbance, and a large variety of interconnected forest and marsh communities resulting from diverse site and probably climatic factors. An ecosystem approach should guide further inventory and evaluation of biological resources. Certain tracts are worthy of immediate consideration for special protection.

Acknowledgements

Victoria Grant maintained and shared NPS data files on heronries and swans. The following contributed observations or assistance (knowingly or not): Tim Blumenschine, Barbara Coffin, Eric Epstein, Craig Faanes, Joan Galli, Charlene Gieck, Victoria Grant, Jim Hoefler, Randy Hoffman, Joe Hudick, Kelly Kearns, John Kiel, Paul Kooiker, Mary Miller, Sam Moore, Gerda Nordquist, Lee Pfannmuller, John Voelker, and Dick Weisbrod. A number of people helped specifically with swan research on the river, including WDNR, MDNR, and NPS personnel, the WDNR/UW swan research crew, and landowners such as Jake Bradac. Thanks to Chris Trevorrow for preparing the manuscript, and to Eric Epstein, Lisa Hartman, Gerda Nordquist, and Sam Robbins for their critical reviews. The Minnesota County Biological Survey and Natural Heritage Database, and WDNR Bureau of Endangered Resources provided timely information on several bird species. MCBS biologist Lisa Hartman collaborated on several canoe surveys, shared personal bird records, and produced Figure 1 for WDNR.

Literature Cited

Bednarz, J. C. and J. J. Dinsmore. 1981. Status, habitat use, and management of Red-shouldered Hawks in Iowa. *Journal of Wildlife Management* 45:236–241.

Bratlie, B. 1976. Acadian Flycatcher sighting and Winter Wren nesting at Franconia. *Loon* 48:187–188.

Curtis, J. T. 1959. *The Vegetation of Wisconsin.* University of Wisconsin Press, Madison. 657pp.

Eliason, B. C. 1988. Minnesota County Biological Survey: 1988 bird surveys. Minnesota Department of Natural Resources, Natural Heritage and Nongame Wildlife Programs. Biological Report Series No. 8:1–79.

Eliason, B. C. and B. A. Fall. 1989. Louisiana Waterthrushes in Washington County: results of the 1988 Minnesota County Biological Survey work. *Loon* 61:34–37.

Faanes, C. A. 1981. Birds of the St. Croix River Valley: Minnesota and Wisconsin. *North American Fauna* 73.

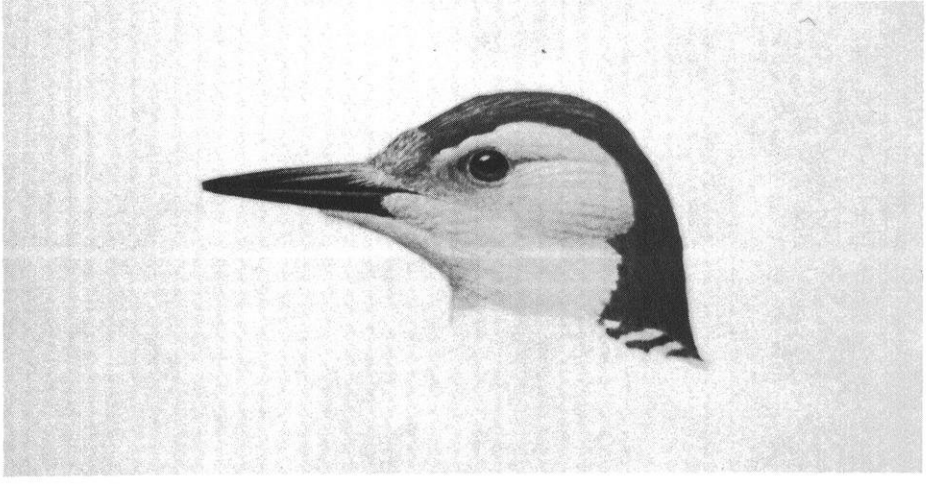
Hoffman, R. M. 1989. Birds of Wisconsin northern mesic forests. *Passenger Pigeon* 51:97–110.

Hoffman, R. M. and M. J. Mossman. 1990. Birds of northern Wisconsin pine forests. *Passenger Pigeon* 52:339–355.

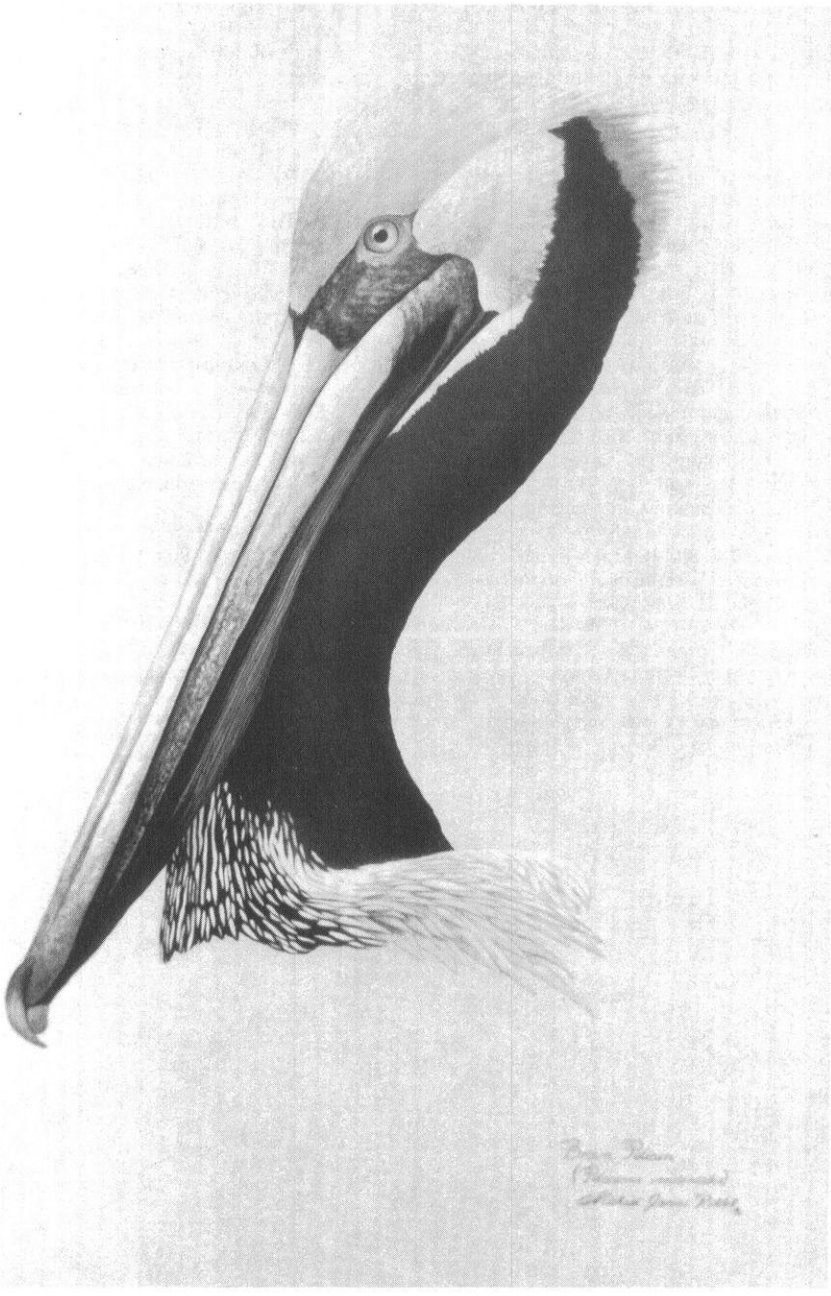
Hubert, B. 1945. Prothonotary Warblers. *Flicker* 17:91. Jackson, H. H. T. 1941–43. Summer

birds of northwestern Wisconsin. *Passenger Pigeon* 3:87–90, 95–98, 103–106; 4:9–12, 37–39, 91–95; 5:24–35.
Janssen, R. B. 1987. *Birds in Minnesota*. University of Minnesota Press, Minneapolis. 352pp.
Langley, W. H. 1973. The Louisiana Waterthrush still nests in Chisago County. *Loon* 45:95–96.
Maurer, R. 1970. Gnatcatchers in Washington County. Loon 42:145.
Mossman, M. J. 1988. Birds of southern Wisconsin floodplain forests. *Passenger Pigeon* 50:321–337.
Mossman, M. J., E. Epstein, and R. M. Hoffman. 1990. Birds of Wisconsin boreal forests. *Passenger Pigeon* 52:153–168.
Mossman, M. J. and K. I. Lange. 1982. *Breeding Birds of the Baraboo Hills: Their History, Distribution, and Ecology*. Wisconsin Department of Natural Resources and Wisconsin Society for Ornithology. 197pp.
Mossman, M. J. and P. E. Matthiae. 1988. Wisconsin bird habitats: introducing a new series. *Passenger Pigeon* 50:43–51.
Mossman, M. J. and R. M. Hoffman. 1989. Birds of southern Wisconsin upland forests. *Passenger Pigeon* 51:343–358.
National Park Service. 1988. St. Croix National Scenic Riverway map and brochure. U.S. Government Printing Office.
Peterson, R. T. 1980. *A Field Guide to the Birds of Eastern and Central North America*. Houghton Mifflin Co., Boston. 383pp.
Robbins, S. 1991. *Wisconsin Birdlife*. University of Wisconsin Press, Madison.
Roberts, T. S. 1932. *The Birds of Minnesota*. University of Minnesota Press, Minneapolis. 2 vols. 691, 821 pp.
Southern, W. E. 1962. Notes on Cerulean Warbler life cycle. *Passenger Pigeon* 24:9–11.
Stucker, S. P. and G. E. Nordquist. In prep. Minnesota County Biological Survey: 1990 bird surveys. Minnesota Department of Natural Resources, Natural Heritage and Nongame Wildlife Programs. Biological Report Series.
Temple, S. A., M. J. Mossman, and B. Ambuel. 1979. The ecology and management of avian communities in mixed hardwood-coniferous forests. Pp. 132–151. *In* R. M. DeGraaf and K. E. Evans (eds). *Management of North Central and Northeastern Forests for Nongame Birds*. USDA Forest Service, Gen. Tech. Rep. NC-51. 268pp.
Williams, R. J. 1957. The Great Blue Heron colonies of Wisconsin. *Passenger Pigeon* 19:51–66.
Zumeta, D. and M. A. Cinotta. 1983. Louisiana Waterthrush in Pine County. *Loon* 55:89.

Michael J. Mossman
Bureau of Research
Wisconsin Department of Natural Resources
Madison, WI 53704



Red-bellied Woodpecker *by Michael James Riddet* (Reprinted with permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).



Brown Pelican *by Michael James Riddet* (Reprinted with permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

The Other Things That Live in Bird Houses

by Scott R. Craven

Countless thousands of bird houses grace our backyards and rural properties. Whether commercially manufactured or homemade, wooden or metal, palatial or plain, they all share in a common goal—to attract nesting birds. There are 3 possible outcomes in the pursuit of this goal: occupancy by the desired residents, occupancy by unwelcome residents, or no use at all. This article will deal with one of the less desirable outcomes—unwelcome residents. Some of these may be primary users, such as small mammals or wasps; others may be insects and other invertebrates that parasitize the intended residents.

Proper construction and placement of a bird house does not always guarantee its use by the intended species. Entrance-hole diameters are quite specific for certain birds, and they can exclude certain unwelcome species. However, diameters over 1 3/8 inches will admit House Sparrows, and diameters over 1 1/2 inches are ample for European Starlings. Also, perches adjacent to entrance holes are unnecessary and tend to encourage use by sparrows and starlings. Both of these exotic pest species readily nest in bird houses and preclude occupancy by Eastern Bluebirds, Purple Martins, and other attractive native species. There are several options for coping with competition from sparrows and starlings.

To discourage House Sparrows from using martin colonies, either mount the martin house on a take-down support pole so that it can be removed and cleaned for winter storage or make entrance-hole covers that can be installed after the martins have left in the fall. Either alternative will prevent sparrow and starling use over winter. Be sure to reactivate the house in time for the arrival of the first martins in spring (usually in early to mid-April.)

If sparrows remain a nuisance after martins arrive, be persistent in the removal of their nests. A coat hanger or other stout wire with a hook bent in one end works very well for nest removal. It is best to remove sparrow nests in mid-afternoon when most martins will be out foraging. Sparrow nest removal and destruction of eggs or young should be done whenever

they are found in single occupancy bird houses. Remember that House Sparrows and European Starlings are exotic species, not protected by the same laws that protect virtually all native birds. Thus, they can be dealt with in ways not legally available for other species. However, if you choose to reduce sparrow or starling populations by trapping, shooting, or even the use of toxicants, be sure to check state wildlife regulations for any required permits or limitations.

There are several types of sparrow traps available commercially. Either "elevator" or "funnel" styles can be used with excellent results. Check garden centers, hardware stores, and farmer cooperatives for trap availability. One ingenious Eastern Bluebird enthusiast has even developed a sparrow trap that can be mounted directly on a "Peterson-style" bluebird house.

Other birds that take over houses intended for another species are best tolerated, even if they are not the intended residents. For example, Tree Swallows that use a bluebird house *cannot* be evicted with the enthusiasm and legal impunity often directed at House Sparrows. In cases like this, consider some additional houses to accommodate both species, and pay careful attention to placement of houses. Very open farmland or sites near water are more attractive to Tree Swallows than Eastern Bluebirds. With the possible exception of sparrows and starlings, any bird is better than no bird! To identify nests or eggs found in a bluebird house consult a field guide such as *A Field Guide to Birds' Nests* by G. Harrison in the Peterson Field Guide Series, the nest-check guidelines in literature from Bluebird Restoration Associate of Wisconsin (BRAW), or *The Bluebird* by Zeleney (1976).

Unwanted mammalian intruders in bird houses can be evicted by removing their nests. Mice can be discouraged by completely closing entry holes or opening the tops or sides of houses during the winter. Otherwise a nest of mice can be evicted as encountered. White-footed mice and deer mice (*Peromyscus* sp.) are actually rather attractive native mammals and an important prey species for raptors and mammalian predators. Watching them raise a family can be every bit as enjoyable and educational as watching birds. These mice are often attracted to a wren house placed 3–4 feet off the ground near dense low growth or plant debris.

Squirrels will readily enlarge the entrance hole of any wooden bird house to meet their own requirements. Damaged boxes should be repaired and the squirrels evicted. Attempts to rid a yard of squirrels by capturing and removing them usually fail, so try giving squirrels their own boxes. A wooden nest box built to Wood Duck specifications, but with a side entrance rather than a front entrance, will provide gray and fox squirrels with a home of their own, and it will reduce competition for nesting space. Flying squirrels are attractive nocturnal mammals that occasionally use bird houses. They are usually viewed as desirable tenants, and they should be encouraged rather than discouraged. An occasional snake may enter a bird house in search of eggs or young birds. If a snake is discovered, it should be removed as a potential predator. Snakes do not, however, become long-term tenants. Most snakes will not be capable to gaining access to a well built and positioned bird house.

Bees and wasps pose a risk as well as a nuisance. During the winter a wasp nest can be safely removed and disposed of. The interior of the box should be sprayed with a disinfectant (Lysol or a weak bleach solution). If the wasps are still active, the simplest approach is to wait for freezing weather and then remove the nest as part of routine nest-box maintenance. Paper wasps, bald-face hornets, and all other hornets and wasp colonies die out over the winter, only a single queen survives to start colonies the next spring. It is unlikely they can reestablish a large active colony early enough in the spring to compete with most early-nesting birds. If you do need to remove an active nest from a bird house, protect yourself with a quick-kill, synthetic pyrethroid insecticide (sold as wasp and hornet sprays) that leaves no residues that might harm future nest-box residents. Ask about a good choice at a garden center or hardware store.

Another category of unwelcome bird house residents are the insects and other parasites that can debilitate nestling birds or plague the adults. A good example is the blowfly (*Arpaulina* sp.). They are considered to be among the most serious ectoparasites of bluebirds and Tree Swallows. These common flies lay their eggs in nest material. You won't be able to see the eggs, but you can see the maggot-like larvae which feed on the blood of nestling birds. June and July seem to be the most common months for blowfly problems.

Kim Mello, reporting for the Bluebird Restoration Association of Wisconsin, found blowfly larvae just below the cup of large bluebird nests, perhaps one to three inches below the nestlings. In shallow nests the larvae are often on the nest box floor. Sometimes lightly tapping on an elevated nest will cause the larvae to fall out of the nest material to the floor of the box where they can be removed. Another trick involves installing a wire mesh subfloor that supports the nest but allows the larvae to filter through and become trapped between the mesh and the box floor. I am not aware of any tests of this method, but it sounds logical. BRAW guidelines suggest lifting the nest at each visit, and "if larvae are found, remove them from the box. When heavy infestation occurs (perhaps more than 100 larvae per nest), you may need to remove the entire bluebird nest and make a new nest from dried grass."

In most cases, with other species of birds, repeated unsuccessful attempts to evict pest insects can be more of a threat to nest success than the blowflies and other parasites. Annual nest-box cleaning and sanitation will help eliminate most problems.

There are also numerous species of lice and mites which frequent nest boxes. Most are very host-specific, meaning that a "robin" louse would not parasitize a Blue Jay or vice versa. In Purple Martin colonies, lice or red mites can debilitate nestlings, and various sources recommend an assortment of pesticides—a pinch of 1% Rotenone or a dusting of garden sulphur, for example to eliminate them.

While virtually any insecticide will kill the lice or mites there are two very important issues to consider before fumigating a bird house. First, the impact of the insecticide on the birds is a potential concern. Presumably those mentioned in the birding literature have been used with no ill effects.

However, since pesticides are often identified as at least one of a litany of causes involved in the decline of some bird populations, many people are reluctant to use them. Second, and more important, to use a pesticide in a manner for which it has not been labelled by the EPA is a violation of state and federal law. Several pesticides are clearly safe for use around birds. For example, a cursory check of pesticide labels turned up registered uses of both malathion and sevin for parasites on poultry. However, "bird houses or wild birds" are *not* mentioned on the labels. Thus, I leave the matter of pesticide-based solutions open to your decision.

Although there appears to be a long list of threats to the well-being of the intended tenants of your bird houses, don't despair. Most of these problems are neither common nor widespread. Protective measures can be taken, but in most cases the birds themselves are remarkably resilient and capable of taking care of themselves.

Scott R. Craven
Department of Wildlife Ecology
University of Wisconsin
Madison, WI 53706

Pied-billed Grebe *by Michael James Riddet* (Reprinted with permission of the artist and Hawkshead Ltd. Wildlife Art, Boscobel, WI 53805).

The Summer Season: 1990

by Thomas K. Soulen

Continuing the spring pattern, most areas experienced above average rainfall, at least into the first part of July. Many farmers had to delay planting and some harvesting because of wet conditions. Rains heavy enough to cause some local flooding occurred several times, mostly during the latter half of June. Green Bay set a new 24 hour rainfall record (4.9 inches) June 21, and Darlington received 7.2 inches on June 28. Jerry Smith reported rain on half the days in June in St. Croix County, with a total for the month of nearly 11 inches. By the end of June, almost no Wisconsin farmers were reporting any lack of soil moisture. July was not dry, but it was drier, with surface moisture in some localities becoming deficient during the month. Storms during the season generally were not violent, although considerable tree and powerline damage occurred in some areas during storms near the end of June.

The summer of 1990 produced few temperature extremes. The maximum reached 100° in only one week, with Altoona reporting 102° on July 3. The 98° Milwaukee experienced on the 4th was a new record for that date. The thermometer reached into the low 90's during only two weeks in June and two weeks in July, and there were no extended heat waves. It cooled enough during every week in the summer to provide night temperatures at least as low as the mid-40's somewhere in the state. The season's low was 25° at Lake Thompson on June 4, with mid-30's somewhere in the state on June 24, July 6, and July 13.

There were not many comments relating weather or water levels to bird life. Eric Epstein noted a short-lived influx of gulls, terns and ducks at Lake Tomah June 3, following an intense storm with strong winds and low temperature. The plentiful rains earlier in the summer helped to produce shorebird habitat in some areas, eliminated muddy shores in others. Some marshy areas in southern counties may have had poor nesting success due to high water. In contrast, low water levels characterized some areas in north central counties. Becky Isenring commented that in northwestern Dane County, the "very wet summer has produced an insect crop with good and

bad ramifications. The extra food was a bonus for insectivores, helping fledge many bluebirds. BUT then the farmers around me were encouraged to aerial spray for European corn borer and potato leaf hopper. This has caused most of the orioles, bluebirds and whip-poor-wills to either leave the area or they were killed. Many of these had already fledged (in the case of bluebirds here—2 broods) and I hope that a fair number survived and have found fields with untainted prey."

Wisconsin observers found a total of 264 species during the season. Of these, 76 were common and widespread enough to be reported from more than 25 counties; they are not included in the listings below. An additional 38 species were observed in 10–25 counties. The figure following each of these species is the number of counties in which it was observed: Pied-billed Grebe (22), Double-crested Cormorant (17), American Bittern (18), Great Egret (11), Black-crowned Night Heron (12), Northern Shoveler (10), Redhead (10), Ring-necked Duck (10), Ruddy Duck (10), Osprey (23), Bald Eagle (18), Sharp-shinned Hawk (19), Cooper's Hawk (19), Red-shouldered Hawk (16), Broad-winged Hawk (25), Ring-necked Pheasant (22), Ruffed Grouse (23), Northern Bobwhite (13), Sora (20), American Coot (14), Common Snipe (19), American Woodcock (17), Herring Gull (17), Caspian Tern (13), Black Tern (23), Great Horned Owl (22), Whip-poor-will (14), Marsh Wren (21), Blue-winged Warbler (11), Golden-winged Warbler (19), Northern Parula Warbler (11), Magnolia Warbler (10), Black-and -White Warbler (22), Canada Warbler (12), Yellow-headed Blackbird (19), Brewer's Blackbird (25), Purple Finch (18), and Evening Grosbeak (10). The remaining 150 species are dealt with in the summary below.

The summer produced several noteworthy rarities. A Common Black-headed Gull spent several days in Manitowoc. A Great Gray Owl nest, one of very few ever reported in Wisconsin, was discovered in the Apostle Islands, and a bird also was reported from Douglas County. This season's canvass of suitable Kirtland's Warbler habitat yielded one bird, again in Jackson County.

Other species of interest, some because they normally are rare in Wisconsin in summer, were American White Pelican, Snowy Egret, Little Blue Heron, Cattle Egret, Yellow-crowned Night-Heron, Greater White-fronted Goose, Snow Goose, Black Scoter, Swainson's Hawk, Rough-legged Hawk, Spruce Grouse, Yellow Rail, American Avocet, Whimbrel, Buff-breasted Sandpiper, Laughing Gull, Little Gull, Snowy Owl, Western Kingbird, Carolina Wren, Northern Mockingbird, White-eyed Vireo, Philadelphia Vireo, Yellow-throated Warbler, and Sharp-tailed Sparrow. Details of these sightings are in the summary below.

This may have been the first summer ever that all five grebe species were observed in Wisconsin. Horned Grebes remained through June in Door County, while Rush Lake, that "island" of western marshy habitat in Winnebago County, produced the other four, including the state's first documented nesting of the Western Grebe.

From time to time observers are thorough enough in their early June birding in the right kind of season to

document considerable late migration. Some years the result may be reports of quite a few "northern" warbler species in southern counties well into June. This year Bob Russell happened to be in the right place to document another kind of late migration. In Rock Island State Park in Door County on June 1, he witnessed a major northward movement of hawks of eight species, most of them coming over the water from Washington Island. Included were 110 of "the saddest looking Broad-winged Hawks you've ever seen," with the "great majority. . .molting and missing at least two secondary feathers on each wing." Of particular note was an immature (first summer) Rough-legged Hawk. He also saw Turkey Vulture, American Kestrel, Merlin, and Sharp-shinned Hawks, Red-shouldered Hawks and Red-tailed Hawks.

The most disturbing feature of this season's reports was the number of species stated to be less common this year than last. In the past seven years, the number of species characterized by at least three observers to be less common (or absent entirely) has averaged 16. This year no less than 37 species made this list (those in italics were said by at least five observers to be "down" in numbers): *Great Blue Heron, Blue-winged Teal,* Ring-necked Pheasant, Virginia Rail, Sora, American Coot, Spotted Sandpiper, Caspian Tern, Common Tern, Forster's Tern, *Black-billed Cuckoo, Yellow-billed Cuckoo, Common Nighthawk,* Whip-poor-will, Ruby-throated Hummingbird, *Red-headed Woodpecker,* Northern Flicker, Least Flycatcher, Eastern Kingbird, Cliff Swallow, Blue-gray Gnatcatcher, *Wood Thrush, Brown Thrasher,* Red-eyed Vireo, American Redstart, Mourning Warbler, *Scarlet Tanager,* Rose-breasted Grosbeak, Dickcissel, *Rufous-sided Towhee,* Vesper Sparrow, Grasshopper Sparrow, Swamp Sparrow, Bobolink, Eastern Meadowlark, Western Meadowlark, and *Northern Oriole.* The only three species reported as more common this year than last (by four or more observers each) were Canada Goose, Eastern Bluebird and House Finch.

It is risky to draw conclusions from a single year's change, of course, but in no previous year of these seven has the total number of species reported as "down" exceeded 22. The number of individuals reporting their impressions of changes in species abundance has crept up gradually in recent years. Furthermore, the particular individuals providing that information change some from year to year. Nevertheless, it is worth noting that the number of such people was the same (21) in both 1989 and 1990. Yet last year's "down in population" species list numbered 18, compared to this year's 37.

Coverage of the state was better this summer than last, although not as good as it has been in some recent years. A total of 67 contributors provided at least some coverage of 64 counties. A number of "faithfuls" continue to submit their home county observations, and for these we are particularly grateful. Their records, as well as their comments on perceived changes in abundance through the years, give us useful indicators of what is happening to some of our breeding species. We also benefit from receiving records of those who visit other counties; quite a few of our counties end up on the "covered" list only because of the time these traveling birders take to summarize their observations.

It was good again this year to receive reports from some new contributors, as well as to welcome back some who had not submitted records for several years. These gains unfortunately were accompanied by the lack of reports from others who have contributed in past years. We can only hope that through time, more and more individuals will report their summer observations annually, as they realize the special importance of what we learn about the status of our breeding species.

Reports (June 1–July 31, 1990)

Common Loon.—An immature spent the summer on Fish Lake, Dane Co. (Isenring). Two birds appeared in Madison July 28 (Ashman). Reported also from 19 more northern counties.

Horned Grebe.—Two birds that remained in Door Co. through July 2 were unusual (the Lukes).

Red-necked Grebe.—Up to four adults were noted in St. Croix Co. (Berner, the Smiths). Several reports came from Rush Lake, Winnebago Co.; Ziebell located nine nests there and counted a high of 58 birds on June 25. Also observed in Douglas Co. June 3 (Johnson) and in Green Lake Co. (Schultz, Tessen).

Eared Grebe.—Noted on Rush Lake, Winnebago Co., June 25 through July 26 (Paul Bruce, Tessen, Ziebell). Ziebell observed three adults there on July 10.

Western Grebe.—Wisconsin's first nesting record came from Rush Lake, Winnebago Co., where Ziebell located two nests and observed at least 10 adults. Birds were seen by a number of observers, and five young were still present at the end of the period.

American White Pelican.—Quite unexpected was a bird present in Barron Co. for several days beginning July 21; an excellent photograph of it appeared in the Rice Lake newspaper (fide Goff). Up to two birds were noted by several observers in Winnebago Co. (Rush Lake) beginning July 19 (Lesher, Ziebell). Also observed in Douglas Co. July 21–27 (Johnson, Semo).

Least Bittern.—Reported from only nine counties: Brown, Columbia, Dane, Fond du Lac, Green Lake, Iron, Manitowoc, Sheboygan and Winnebago.

Snowy Egret.—The season's only report came from Brown Co. June 8 (Tessen).

Little Blue Heron.—An adult was seen by a number of observers in Ozaukee Co. June 5–6; it was first located by Roger Sundell. A bird changing into adult plumage was present in Winnebago Co. July 26 (Tessen).

Cattle Egret.—Single birds were noted in Brown Co. June 8 (Tessen) and Winnebago Co. July 1 (Ziebell).

Yellow-crowned Night-Heron.—Reported in Milwaukee Co. July 25 (Jeff Baughman).

Tundra Swan.—Birds were present through June 26 in the Ashland/Bayfield Co. area (Verch) and July 11 in Taylor Co. (Armbrust). There also were observations in Brown Co. June 6 (Mead), Eau Claire Co. July 6 (Polk), and Portage Co. June 24 (Berner).

Trumpeter Swan.—Observations continue as a result of recent reintroduction programs. Young were raised at Oakridge Lake in St. Croix Co. (Berner, the Smiths). Three birds were at Crex Meadows, Burnett Co. on June 5 (Lesher).

Mute Swan.—Observed in Ashland, Bayfield, Dane, Door, Douglas, Marinette and Portage Counties.

Greater White-fronted Goose.—A June 3 report from Bayfield Co. is very unusual (Lesher).

Snow Goose.—A single bird at Goose Pond, Columbia Co. on June 4 was very late (Ashman).

Green-winged Teal.—Noted in Ashland,

Barron, Bayfield, Dodge, Green Lake, Manitowoc, Marathon, St. Croix and Winnebago Counties.

American Black Duck.—The only reporting counties were Ashland, Bayfield, Manitowoc, Marinette, Outagamie, Sawyer, Sheboygan and St. Croix.

Northern Pintail.—Two birds were present in St. Croix Co. from June 27 through July 19 (the Smiths). No other reports.

Gadwall.—Observed in Ashland, Bayfield, Brown, Columbia, Fond du Lac, Green Lake and Winnebago Counties.

American Wigeon.—This year's reporting counties were Ashland, Bayfield, Columbia, Dodge, Fond du Lac, Green Lake, Marinette and Vilas.

Canvasback.—One remained until June 4 in Columbia Co. (Ashman). Noted through June 26 in the Ashland/Bayfield Co. area (Verch). Two were present in Manitowoc Co. from June 11 on (Sontag, others). Up to two were in Winnebago Co. from June 25 through July 19 (Ziebell).

Greater Scaup.—Single birds were in Manitowoc Co. June 8 (Tessen) and Door Co. throughout the period (the Lukes).

Lesser Scaup.—Noted in Ashland, Bayfield, Brown, Columbia, Dane, Douglas, Manitowoc and Sawyer Counties.

Black Scoter.—An unusual summer observation came from Forest Co. July 5 (Reardon).

Common Goldeneye.—Bred again in Sawyer Co. (Castelein, Lauten, Robinson). Also observed in Ashland/Bayfield (Verch) and Door (the Lukes) Counties.

Bufflehead.—One bird was in Dunn Co. June 13 (Polk). Present at the beginning of June in the Ashland/Bayfield Co. area (Verch).

Hooded Merganser.—Reported from 20 counties, considerably more than in most recent summers.

Common Merganser.—This season's 13 counties also represents significantly more reports than are usual in summer.

Red-breasted Merganser.—Observed in Ashland, Bayfield, Door, Douglas and Manitowoc Counties.

Northern Goshawk.—Noted through most of the period in Ashland/Bayfield (Verch), Door (the Lukes) and Marinette (the LaValleys) Counties. Also observed in Douglas (Semo), Sawyer (Castelein, Lauten), Taylor (Risch) and Vilas (Reardon) Counties.

Swainson's Hawk.—A bird in Oconto Co. June 10 was very unusual (Tessen).

Rough-legged Hawk.—A first year bird was seen migrating with a number of other hawks in Door Co. June 1 (Russell). Present at the beginning of June in Barron Co. (Goff).

Merlin.—More reports than in most years, from Ashland (Verch), Bayfield (Hoffman, Lesher, Verch), Burnett (Lesher), Douglas (Johnson) and Sawyer (Castelein, Lauten) Counties. One was seen migrating with a number of other hawks in Door Co. June 1 (Russell).

Peregrine Falcon.—Birds continue to be seen in Dane and Milwaukee Counties, where releases have occurred.

Gray Partridge.—Noted in Dane, Door, Fond du Lac, Manitowoc, Monroe and St. Croix Counties.

Spruce Grouse.—A single bird was seen June 1 in Douglas Co. (Green), and a female and one young were noted in Sawyer Co. July 1 (Castelein, Lauten).

Greater Prairie-Chicken.—Recorded in Burnett (Castelein, Lauten), Marathon (Belter), Portage (Berner) and Taylor (Risch) Counties.

Sharp-tailed Grouse.—Observed in Taylor (Armbrust) and in Burnett and Douglas (Lesher) Counties.

Wild Turkey.—Reports came from these counties: Dane, Fond du Lac, Florence, Marinette, Richland, Sauk, Shawano and Walworth.

Yellow Rail.—Lesher was lucky enough to see one flushed in Burnett Co. June 26.

King Rail.—Two birds were in Fond du Lac Co. June 15 (Jeff Baughman). Noted also in Columbia Co. July 9 (Robbins).

Virginia Rail.—Two adults and 10 young were seen in Sawyer Co. June 24 (Castelein, Lauten). Noted in 9 additional counties.

Common Moorhen.—Reported only from Brown, Columbia, Dane, Manitowoc and Winnebago Counties.

Sandhill Crane.—The bird Robinson encountered in Ashland Co. June 10 was in an unusual forested location. Noted in 28 additional counties.

Black-bellied Plover.—One bird was present in Manitowoc Co. July 29 (Tessen).

Lesser Golden-Plover.—For the second year in a row, a breeding plumage bird was in Dane Co. near mid–June, this year on the 18th (Russell, Shelley Racek). One with a broken wing was in Ashland Co. June 20 (Hoffman, Verch).

Semipalmated Plover.—Present during the first few days of June in Ashland and Bayfield Counties (Lesher, Verch). A bird had returned to Manitowoc Co. by July 22 (Sontag), with reports from four other counties during the next week.

Piping Plover.—For the second summer in a row, there were no reports of this species.

American Avocet.—Two birds first found by Frank Freese on Lake Wingra in Madison, Dane Co. provided a treat for several observers July 9 (Ashman, Hansen, Robbins). Observed also in Winnebago Co. July 23 (Jeff Baughman).

Greater Yellowlegs.—Noted in Winnebago Co. July 14 (Ziebell), in Dane (Ashman) and Taylor (Risch) Counties the next day, and in four additional counties within the next week.

Lesser Yellowlegs.—Remained in Manitowoc Co. until June 10 (Sontag). Returned to four widely scattered counties July 1–3.

Solitary Sandpiper.—The earliest migrants were reported from Dane Co. July 2 (Hansen), Taylor Co. July 6 (Risch), and Portage Co. July 7 (Berner).

Upland Sandpiper.—Berner found 14 in Portage Co. June 24. Noted in 17 additional counties.

Whimbrel.—One was in Manitowoc Co. June 8 (Sontag).

Ruddy Turnstone.—Sontag found 650 in Manitowoc Co. June 1, with birds lingering there until July 5. Also observed in Milwaukee Co. July 25 (Jeff Baughman).

Red Knot.—One in Manitowoc Co. June 1 (Sontag).

Sanderling.—Spring migrants remained in Douglas Co. through June 5 (Johnson) and Ashland/Bayfield (Verch, 28 birds) and Manitowoc (Sontag) Counties until June 10. Had returned to Manitowoc Co. by July 18 (Lesher), Sheboygan Co. by July 20 (the Brassers), Milwaukee Co. by July 25 (Jeff Baughman), and Douglas Co. by July 27 (Semo, 46 birds).

Semipalmated Sandpiper.—Were the five in Ashland Co. June 20 (Hoffman) spring or fall migrants? The latest obvious spring migrants were in Manitowoc Co. June 9 (Sontag), and the earliest obvious fall migrants appeared in Dane Co. June 24 (Hansen). Except for reports from St. Croix Co. July 2 (the Smiths) and Taylor Co. July 8 (Risch), other returning birds did not appear until July 20 or later.

Least Sandpiper.—Remained in the Ashland/Bayfield Co. area through June 10 (Verch). A June 24 bird in Dane Co. was reported as a fall migrant (Hansen). Appeared July 4 in Manitowoc (Sontag) and Taylor (Risch) Counties.

White-rumped Sandpiper.—Recorded in these counties: Kewaunee June 3 (Mead), Dane June 4 (Ashman) and 6 (Hansen), Douglas June 5 (Johnson), Manitowoc June 8 (Tessen), Ashland June 20 (Hoffman), Dane June 24 (Hansen), and Taylor July 25 (Risch).

Baird's Sandpiper.—Noted until June 2 in Barron Co. (Goff), in Ozaukee Co. June 8 (Tessen), and in Manitowoc Co. July 31 (Sontag).

Pectoral Sandpiper.—Reported first from Taylor Co. July 11 (Risch) and Dane Co. July 15 (Ashman). Appeared in five additional counties within the next week.

Dunlin.—Lingered until June 6 in Dane (Hansen) and Door (the Lukes) Counties, June 10 in the Ashland/Bayfield Co. area (Verch) and June 14 in Manitowoc Co. (Sontag). Reappeared in Manitowoc Co. July 18 (Lesher) and Winnebago Co. July 25 (Jeff Baughman).

Stilt Sandpiper.—Four birds were in Manitowoc Co. July 19 (Sontag), with others appearing July 21 in Dane Co. (Ashman), July 23 in Winnebago Co. (Jeff Baughman), and July 29 in Outagamie Co. (Tessen).

Buff-breasted Sandpiper.—Five appeared in Eau Claire Co. July 29, with some remaining into August (Polk).

Short-billed Dowitcher.—Reported from Manitowoc Co. July 5 (Sontag) and Dane (Hansen) and Milwaukee (Tessen) Counties July 9. Noted July 21 and later in four additional counties.

Long-billed Dowitcher.—Reported from St. Croix Co. July 16 (the Smiths) and Outagamie Co. July 29 (Tessen).

Dowitcher sp..—This is the annual plea for documentation of dowitcher reports, so that we may become more confident about migration patterns of the two species in Wisconsin. Out of 12 reports this year, only two (both of Short-billeds) were documented.

Wilson's Phalarope.—Lesher photographed a nest with 4 eggs in Burnett Co. June 5. Considerably fewer reports this year than usual: Ozaukee Co. June 8 (Tessen) and Dane (Ashman) and Fond du Lac and Winnebago Counties (several observers in each) the last week in July.

Laughing Gull.—An immature was seen in Kenosha Co. July 15 (Russell). Accepted by the Records Committee. See "By the Wayside." Single adults were seen in Manitowoc Co. through June 18 (Sontag) and Milwaukee Co. July 9 (Tessen).

Franklin's Gull.—Present until July 7 in Manitowoc Co. (Sontag). Noted also in Monroe Co. June 3 (Epstein, 5 birds), Marinette Co. June 6 (Hoffman, 2 birds), and Milwaukee Co. July 9 and 29 (Tessen, 3 and 2 birds).

Little Gull.—Seen by several observers in Manitowoc Co., last on July 20 by Sontag, who counted a maximum of two birds there this year.

Common Black-headed Gull.—Wisconsin's second summer record of this species came, as did its first in 1983, from Manitowoc Co., June 21–23 (Sontag). Accepted by the Records Committee. See "By the Wayside."

Bonaparte's Gull.—Reported throughout the period in Manitowoc Co., where Sontag counted 850 on June 9, and in Milwaukee and Sheboygan Counties. Noted also in Ashland/Bayfield Counties through June 10 (Verch).

Common Tern.—Observed throughout the period in Door, Douglas, Manitowoc (Sontag, 75 on June 23) and Marinette Counties and also in Ashland, Bayfield, Brown, Sheboygan and Winnebago (Ziebell, through July 14, with 3 on June 30) Counties.

Forster's Tern.—Present throughout the period in these counties: Brown, Fond du Lac, Green Lake, Manitowoc (Sontag, 45 on June 10), Marinette, and Winnebago (Ziebell, 116 on June 25, with 33 nests counted during the season). Also noted in St. Croix Co. June 25 and July 18 (the Smiths).

Yellow-billed Cuckoo.—Reported from Douglas Co. July 20 (Johnson), Florence Co. through June 11 and Marinette Co. throughout the season (the LaValleys), and Price Co. June 5 (Risch), as well as from 14 more southern counties.

Eastern Screech Owl.—Observers found these in Dane, Jefferson, Milwaukee, Monroe, Portage, Richland and Winnebago Counties.

Snowy Owl.—A bird present in Calumet Co. for over a week was photographed July 4 by Settle and seen also by Carol and Martin Rudy and Mark Growe. See "By the Wayside."

Great Gray Owl.—An adult and nest with three young was found July 3 on Stockton Island, Apostle Islands National Lakeshore, Ash-

land Co. (Van Stappen, David Trauba, Thomas Doolittle, Robert Brander). There are very few Wisconsin nesting records. An injured bird was found June 28 in Douglas Co.; after rehabilitation it was released July 21 at the site where it was found, which also was near the area where feathers and pellets were observed in the summer of 1988 (Semo). Both records accepted by the Records Committee. See "By the Wayside."

Long-eared Owl.—An adult and four young were seen in Dane Co. June 4 (Hansen).

Short-eared Owl.—Noted near the end of July in Price Co. (Hardy).

Northern Saw-whet Owl.—Observed throughout the period in Ashland/Bayfield (Verch) and Douglas (Semo) Counties. Reported also from Florence and Marinette (the LaValleys) and Iron (the Gaugers, Risch) Counties.

Red-bellied Woodpecker.—Of the 27 counties from which this species was reported, the most northern were Barron (Goff), Marathon (Belter), Marinette (the LaValleys, Lindberg) and Taylor (Armbrust).

Yellow-bellied Sapsucker.—A nesting in Calumet Co. was south of the usual range of this species in eastern Wisconsin (Sontag). Noted also in 26 more northern or western counties.

Black-backed Woodpecker.—For the first time in a number of summers, there were no reports of this species.

Olive-sided Flycatcher.—Lingering migrants were noted in St. Croix Co. June 3 (the Smiths) and Manitowoc Co. June 7 (Sontag). Also reported from six more northern counties.

Yellow-bellied Flycatcher.—Still present in Milwaukee Co. June 1 (Zehner), Dunn Co. June 2 (Raile), St. Croix Co. June 3 (the Smiths), and Manitowoc Co. June 8 (Sontag). The remaining seven reporting counties were within normal breeding range.

Acadian Flycatcher.—Observers found this species in Dane, Fond du Lac, Jefferson, Lafayette, Manitowoc, Marquette, Monroe, Rock and Sauk Counties.

Alder Flycatcher.—The southernmost report after mid–June was from Walworth Co. July 14 (Tessen). Noted in 26 counties overall.

Willow Flycatcher.—Two were present in Marathon Co. July 8–14 (Belter), and three were in Marinette Co. throughout the period (the LaValleys). The remaining 21 reporting counties were considerably more southern.

Western Kingbird.—Tessen saw one in Winnebago Co. June 15.

Gray Jay.—Observers found these in Ashland, Douglas, Forest, Lincoln, Price, Sawyer and Vilas Counties.

Common Raven.—The most southern reports came from Portage (Berner) and Jackson (Robbins) Counties. Noted also in 16 more northern counties.

Boreal Chickadee.—Reported from Iron (the Gaugers), Lincoln (Hoffman), Marinette (the LaValleys) and Vilas (Jim Baughman) Counties.

Tufted Titmouse.—Noted in Dane, Dunn, Green, Iowa, Sauk and St. Croix Counties.

Red-breasted Nuthatch.—This summer's 27 reporting counties is more than some years. They were at two locations in Dane Co., with at least one nesting (Ashman, Hansen). A bird came to a feeder in Outagamie Co. well into June (Tessen). Noted throughout most or all of the period in Dunn (Raile), Green Lake (Schultz), Milwaukee (Woodmansee) and Sheboygan (the Brassers) Counties, and in Monroe Co. June 5 (Epstein), Jackson Co. June 8 (Robbins), and from July 25 on in Jefferson Co. (Hale). All other reporting locations were more northern.

Brown Creeper.—A Jefferson Co. bird June 23 was farther south than this species is usually found in summer (Hale, Mike Mossman). Berner located a nest in Portage Co. Two birds were in St. Croix Co. June 3 (the Smiths). Reports came from 10 additional counties.

Carolina Wren.—Noted again this year in Dane Co., throughout the period (Hansen).

Winter Wren.—Present in Portage (Ber-

ner) and Waupaca (Peterson) and 14 more northern counties.

Golden-crowned Kinglet.—Located in these counties: Bayfield, Door, Douglas, Iron, Lincoln, Marinette, Price and Vilas.

Ruby-crowned Kinglet.—Observers found these in Ashland, Douglas, Florence, Marinette, Price, Sawyer and Vilas Counties.

Blue-gray Gnatcatcher.—Up to five birds in Marinette Co. through most of the season were unusually far north (the LaValleys). Noted also in Door (the Lukes), Marathon (Belter), and 19 more southern counties.

Eastern Bluebird.—Parsons banded 150 young that fledged near her home in Walworth Co. Reported from the highest number of counties in recent summers (45).

Gray-cheeked Thrush.—An injured bird was in Milwaukee Co. June 5 (Diehl).

Swainson's Thrush.—Still present in Manitowoc Co. June 1 (Sontag) and Marathon Co. June 4 (Belter). Noted mid-June or later in Bayfield (Hoffman, Johnson), Florence and Marinette (the LaValleys), and Forest and Vilas (Reardon) Counties.

Hermit Thrush.—This species summers sparingly in Jackson Co.; Robbins found it there June 8 this year. All remaining 16 reporting counties were considerably further north.

Northern Mockingbird.—The Lukes found one in Door Co. June 9. This is the third time in six summers this species has appeared in this county.

Loggerhead Shrike.—St. Croix Co. again produced the largest number of reports. Among the various observations, at least 3 nests were discovered there; another was found in Pierce Co. (Bruce Bacon, Hudick, the Smiths). Other reports came from Lincoln Co. June 7 (Hoeft), Walworth Co. July 2–17 (Parsons, up to two birds) and Winnebago Co. July 3 (Tessen).

White-eyed Vireo.—Unusual was a bird at High Cliff State Park, Calumet Co. (Carol Rudy fide Tessen). Also present in Grant Co. July 21 (Robinson) and Waukesha Co. June 7 (Hoffman, 2 birds).

Bell's Vireo.—The only report came from Wyalusing State Park, Grant Co., where Robinson found four birds July 21.

Solitary Vireo.—Present until June 2 in Outagamie Co. (Anderson, Petznick) and into early June in Polk Co. (Hudick). The remaining nine reporting counties were more northern.

Yellow-throated Vireo.—Observers found this species in Douglas (Johnson), Florence and Marinette (the LaValleys), Vilas (Jeff and Jim Baughman, Reardon) and 27 more southern counties.

Philadelphia Vireo.—Two birds, seen and identified well, were singing, displaying and chasing each other at Rock Island State Park, Door Co. from May 31 through June 3 (Russell). It is not known whether they were present later than that.

Tennessee Warbler.—Lingered until June 3 in Door (the Lukes) and Marinette (the LaValleys) Counties and until June 6 in Dane (Robbins) Co.

Nashville Warbler.—Seven singing males were in a tamarack bog in Jefferson Co. June 10 (Russell). One in Rock Co. June 8 was unexpectedly far south (Hoffman). Noted also in 18 more northern counties.

Chestnut-sided Warbler.—Observed June 2 in Walworth Co. (Parsons), June 4 in Milwaukee Co. (Woodmansee), June 7 in Dane Co. (Hansen), and June 15 in Rock Co. (Cederstrom). It is not known whether any of these was a summer resident. Noted in 28 counties overall.

Cape May Warbler.—Present in Lincoln (Risch), Sawyer (Castelein, Lauten) and Vilas (Jeff Baughman) Counties in June.

Black-throated Blue Warbler.—Reported from more counties than usual: Ashland, Bayfield, Door, Forest, Langlade, Marinette, Shawano and Vilas.

Yellow-rumped Warbler.—Recorded in

Jackson Co. June 8 (Robbins), Portage Co. until July 6 (Berner), and in 13 more northern counties.

Black-throated Green Warbler.—Present in early June in Portage (Berner), Manitowoc (Sontag) and Sauk (Hansen) Counties, as well as later in 14 northern counties.

Blackburnian Warbler.—In addition to reports from 12 northern counties, one was in Sauk Co. June 11 (Hansen).

Yellow-throated Warbler.—Robbins found one in the usual location along the Sugar River in the Avon Bottoms, Rock Co. on June 21.

Pine Warbler.—Most southern of the 19 reporting counties were Adams June 9 (Robbins), Eau Claire June 15 (Polk), Fond du Lac July 21 (Jeff Baughman), Jackson June 8 (Robbins), Sauk July 14 (Frank), and Sheboygan July 8 (the Brassers).

Kirtland's Warbler.—This year's sole report came from Jackson Co., where Lesher found and photographed a singing male June 10. Accepted by the Records Committee. See "By the Wayside." This bird was subsequently photographed by Polk and also was banded.

Palm Warbler.—The 23 birds counted by Hoffman in Lincoln Co. June 24 must surely represent a record for this species in Wisconsin in summer! Also reported from Douglas (Johnson), Marinette (the LaValleys), Sawyer (Castelein, Lauten) and Vilas (Jeff and Jim Baughman) Counties.

Bay-breasted Warbler.—One remained until June 2 in Marinette Co. (the LaValleys). Present also in Bayfield Co. June 19 (Hoffman) and Iron Co. June 26 (the Gaugers, Risch).

Cerulean Warbler.—Reported only from Dane, Fond du Lac, Jefferson, La Crosse and Monroe Counties.

Prothonotary Warbler.—There were records from these counties: Jefferson, La Crosse, Monroe, Outagamie, Polk and Rock.

Worm-eating Warbler.—Observed in June in the usual Sauk Co. haunts by Hansen and Robbins.

Northern Waterthrush.—Birds in Jefferson Co. June 23 were a bit south of usual reporting locations for this species (Hale, Mike Mossman); seven birds in Rock Co. June 8 were even more so (Hoffman). The other 16 reporting counties were within more normal range.

Louisiana Waterthrush.—Noted in Fond du Lac Co. June 5 (Jeff Baughman, 2 birds) and Sauk Co. in June (several observers).

Kentucky Warbler.—Present in June in Monroe (Epstein), Pepin (Hoffman, 4 birds), Rock (Robbins) and Sauk (Hansen) Counties.

Connecticut Warbler.—Still present in Dane Co. June 6 (Robbins). Noted also in Ashland/Bayfield, Douglas, Florence, Marinette and Vilas Counties.

Mourning Warbler.—A bird in Rock Co. June 11 was unusual (Cederstrom). Birds were noted in a few additional southern counties in early June, as frequently happens; it is not known whether they stayed. Observers reported this species in 27 counties overall, most of them northern and central.

Hooded Warbler.—Noted at a dripping water bath in Door Co. throughout the period (the Lukes) and in Fond du Lac Co. through June 5 (Jeff Baughman), Sauk Co. June 27 (Robbins), Shawano Co. July 14, near where one was present in 1986 (Peterson), Sheboygan Co. July 19–25 (Jeff Baughman, Lesher) and Waupaca Co. June 14 (Hoffman, 2 birds).

Wilson's Warbler.—Lingered until June 3 in Door Co. (the Lukes).

Yellow-breasted Chat.—The only report this season was of a male seen and heard almost daily until June 13 in Brown Co. (Wierzbicki).

Northern Cardinal.—Most northern of the 41 reporting counties were Ashland/Bayfield (Verch), Barron (Goff), Douglas (Johnson), Marinette (the LaValleys), Price (Hardy) and Sawyer (Robinson, 3 territorial pairs).

Dickcissel.—Observed in the same number

of counties as last year (24). While numbers and distribution were down considerably from the banner 1988 population, southern counties were represented well. The most northern reports came from Polk Co. (Hudick, 16 territories), Portage Co. (Berner), Shawano Co. (Peterson), and St. Croix Co. (the Smiths, up to 29 birds).

Field Sparrow.—Reported from Barron (Goff), Bayfield (Hoffman), Douglas (Johnson), Florence and Marinette (the LaValleys), Vilas (Jeff Baughman) and 29 more southern counties.

Lark Sparrow.—One in Oconto Co. June 10 (Tessen); surprising as it seems, this species has been seen previously in this location. Also noted in Sauk Co. June 4 (Hansen) and July 14 (Tessen, carrying food).

Grasshopper Sparrow.—Of the 21 counties in which birds were found this season, Douglas (Johnson, Semo) and Oconto (Tessen) were the most northern.

Henslow's Sparrow.—Recorded this season in Florence, Fond du Lac, Green, Green Lake, Lincoln, Portage, Richland, St. Croix, Shawano and Winnebago Counties.

LeConte's Sparrow.—Present throughout the period in Ashland/Bayfield (Verch) and Marathon (Hoeft) Counties. Also noted in Burnett (Castelein, Lauten, Lesher) and Douglas (Johnson, Semo) Counties in June and in Taylor Co. June 10 through July 2 (Risch).

Sharp-tailed Sparrow.—Reported only from Burnett Co. June 26 (Lesher, Jim Hoefler).

Lincoln's Sparrow.—If one locates the right bog(s), one can hit the jackpot with this species, as shown by the 47 birds Hoffman found in Lincoln Co. June 24! Reported also in Ashland, Bayfield, Douglas, Forest, Iron, Sawyer (Castelein and Lauten, 10 in one bog) and Vilas Counties.

White-throated Sparrow.—Lingered until June 5 in Milwaukee Co. (Zehner). Two in Rock Co. June 8 were unusual (Hoffman), as were up to eight in Fond du Lac Co. through the period (Jeff Baughman). The other 18 reporting counties were within the more usual northern range.

Dark-eyed Junco.—Noted in Ashland, Bayfield, Douglas, Florence and Vilas Counties.

Orchard Oriole.—This sometimes not too conspicuous species was found this year in Dane and Sauk (Robbins), Dunn and Rock (Soulen), Monroe (Richter), Ozaukee (Frank), Richland (Duerksen), Trempealeau (Lesher) and Walworth (Parsons) Counties.

House Finch.—Observed in 21 counties this year, compared to 17 last summer. New northern counties included Lincoln, Taylor and Vilas. Lesher remarked on "explosive numbers" in La Crosse Co.

Red Crossbill.—Reported from eight counties, about as many as in any recent summer: Bayfield, Door, Douglas, La Crosse, Marathon, Marinette, Portage and Sawyer.

White-winged Crossbill.—Noted as follows: 47 birds in Ashland Co. June 10 (Robinson), Douglas Co. June 9 to July 4 (Semo), up to 19 birds in Marinette Co. through June 21 (the LaValleys), and Winnebago Co. July 26 (Tessen).

Pine Siskin.—After last spring's huge numbers in some locations, observers found these in 22 counties. However, birds left most areas during June, being noted in only seven counties during July.

CONTRIBUTORS

James S. Anderson, Bill Armbrust, Philip Ashman, Jeffrey L. Baughman, Jim Baughman, Dan Belter, Murray Berner, David and Margaret Brasser, Kathleen Castelein, David Cederstrom, Scott Diehl, Barbara Duerksen, Eric Epstein, Jim Frank, Alvin and Berniece Gauger, Alta Goff, Bob Green, Karen Etter Hale, Ellen Hansen, Maybelle Hardy, Dorothy Harmer, Anita C. Henning, Joyce Hoeft, Randy Hoffman, Joe Hudick, Becky Isenring, Robbye Johnson, Roland J. Kuhn Family, Steve and Laura LaValley, David Lauten, Fred Lesher, Harold Lind-

berg, Charlotte and Roy Lukes, Bob Mead, William P. Mueller, Patricia Parsons, Mark Peterson, Steven Petznick, Janine Polk, Mary Jean Raile, Bill Reardon, Carol Richter, Paul Risch, Sam Robbins, John C. Robinson, Bob Russell, Thomas Schultz, Larry Semo, Paula H. Settle, B. Kay Simandl, Jerry and Karen Smith, Charles Sontag, Tom Soulen, Mark Tacke, Daryl D. Tessen, Julie Van Stappen, Dick Verch, Melvin Wierzbicki, Winnie Woodmansee, Norma Zehner, Tom Ziebell.

Thomas K. Soulen
1725 West Eldridge Avenue
St. Paul, MN 55113

"Silent Outpost" *by Scott Zoellick* (A limited edition print reprinted with the permission of the artist and the publisher, Northwoods Craftsman, Menomonee Falls, WI 53051).

"By the Wayside"

Observations of Common Loon, Laughing Gull, Common Black-headed Gull, Great Horned Owl, Snowy Owl, Great Gray Owl, and Kirtland's Warbler are featured.

Observations of Juvenile Common Loons

1986–87, Iron County, Turtle-Flambeau Flowage.—J. W. McIntyre (*The Common Loon: Spirit of Northern Lakes*, Univ. of Minnesota Press, 1988) stated "There is only a vague understanding about the whereabouts of the young [Common Loons] until they become adults and return to the breeding grounds . . ." Palmer (*Handbook of North American Birds*, Yale Univ. Press, 1962) found that yearling and probably second-year loons summer in northern coastal waters of Atlantic and Pacific oceans, James and Hudson bays, and to a lesser extent, the Great Lakes and other large bodies of fresh water. McIntyre (1988) reported a concentration of juvenile Common Loons observed annually off the coast of New Brunswick. Shladweiler (*Loon* 57:178, 1985) observed a loon in basic plumage in Minnesota during June. Black (*Auk* 52:74, 1935) reported an immature Common Loon killed in central Illinois during july. I present additional sightings of juvenile Common Loons ($\geq$1 year old and lacking definitive alternate plumage). These observations were witnessed while conducting a study of Common Loon ecology in northern Wisconsin (Belant and Anderson, *Passenger Pigeon* 52:307–210, 1990; *Canadian Field-Naturalist* 103:*in press*, 1991; Belant et al. *Wilson Bulletin* 103:*in press*, 1991). All observations were made on the Turtle-Flambeau Flowage (TFF), Iron County, Wisconsin.

On 5 June 1986, at 1508 hrs, a juvenile Common Loon was observed feeding approximately 100 m from shore for 12 min. At 1632 hrs another juvenile loon was observed approximately 3 km southeast of the first observation. This loon was also feeding, about 300 m from an island. It was not known whether these observations represent 1 or 2 individuals.

On 28 July 1986, at 1324 hrs, a juvenile Common Loon was observed for 17 min drifting and preening approximately 800 m from shore.

On 20 May 1987, at 0707 hrs, a juvenile common loon was observed 600 m from the mainland. It was observed swimming and feeding near 2 small islands for 24 minutes.

All observations of juvenile loons occurred in areas that were not maintained as territories or brood rearing areas by adults (J. Belant, unpubl.

data), possibly to avoid aggressive interactions (Rummel and Goetzinger, *Auk* 92:333–346, 1975; *Auk* 95:178, 1978). Eberhardt (*Loon* 56:202–203, 1984) reported recapturing a juvenile loon on the same lake it was captured the year before. Whether the juvenile loons I observed were raised on the TFF is unknown as none of these loons were banded. More extensive banding, surveys, and/or radio telemetry studies are necessary to determine areas of summer and winter use and migration routes of juvenile Common Loons.

Partial funding during these observations was provided by the University of Wisconsin-Stevens Point, Wisconsin Society for Ornithology, Schwartz-Hart Foundation, and North American Loon Fund. Wisconsin Department of Natural Resources, Mercer Station, provided partial logistical support. M-K. W. Belant provided helpful comments on this manuscript.—*Jerrold L. Belant, College of Natural Resources, University of Wisconsin, Stevens Point, WI 54481.*

Laughing Gull (*Larus atricilla*)

15 July 1990, Kenosha County.—Juvenile Laughing Gull seen flying along Lake Michigan shoreline. Bird in partial molt to first winter plumage—seems early but perhaps from a more southerly population. Field notes copied as follows:

"Young Laughing Gull flying along L. Michigan shore just east of Chiwaukee Prairie. Flying leisurely northward with Ring-bills and Bonaparte's nearby for comparison. Bird nearly size of Ring-bills. Long-winged, not short, wide wings like Franklin's. Back and upperwings greyish-brown, bill dark, light rump with dark wide terminal band. Primaries darker than rest of wing. Forehead and side of head light, contrasting with darker back of head. Bird flew along shore within 40 yards of me. Wingbeats strong, more flex to wing than Franklin's."—*Robert P. Russell, Jr., 6429 Bridge Rd. #106, Madison, WI 53713.*

Common Black-headed Gull (*Larus ridibundus*)

21 and 23 June 1990, Manitowoc County.—As I walked along the lakeshore just south of the Manitowoc Yacht Club, my attention was drawn to the courtship sounds of a Little Gull. The object of his affection, however, was not . . . another Little Gull, but another much larger gull that also had dark primaries from below. Moments later they landed about 150 feet south of where I was standing, permitting me to confirm what I had initially suspected. The larger gull displayed the "typical" Bonaparte's upper wing pattern of the anterior white wedge with gray dominating the remainder of the primaries, secondaries and mantle. The white primaries, and the first several of the gray primaries, were tipped in black as if each had been dipped individually in ink. The bird sported the very characteristic brown head that marked out almost a mask like hood. The broken eye crescents, opened extensively toward the lores, were easily seen; however, the eye crescents were not as obvious as those of the Franklin's or even the Laughing Gulls that had frequented the area. At this point, I attempted to photograph the bird, but without luck as the birds flushed because of my activity. About 3/4 of an hour later, the Little and Common Black-headed Gulls were found in the

same area. Bernie Brouchard just happened by and together we completed the observations. The bird was noticeably larger in length, being about 2–3 inches longer than the Bonaparte's Gulls seen in the immediate area. Several times Bernie remarked that the bird was much larger than he remembered it to be from the last time it was seen in Manitowoc. During this observation period, the bird stood on a rock and would aggresively posture to the Bonaparte's that would approach its space too closely. During these encounters, the mask like hood was most evident, as the bird would extend its head horizontally and drop its wings. These threats seemed to attract other Bonaparte's to test this stranger that would respond to and recognize their presence. The feet were about the same color as the bill: a dark red. The bill of the bird looked like that of an upsized Bonaparte's Gull, giving it a distinctly different appearance than that of the Laughing Gull, which is about the same size as the Common Black-headed Gull. The tail was white and unmarked. Although the bird has a very characteristic call, this bird was not heard.—*Charles Sontag, 804 N. 4th Street, Manitowoc, WI 54220.*

Red-tailed Hawk Killed by Great-horned Owl

13 September 1990, Marinette County.—The setting sun had revealed that the day's hunt was coming to an end as I watched it slowly sink into the western sky. I had placed my tree stand a quarter of a mile off one of the fields of my Uncle's farm, giving me a substantial hike through the woods to the old sand trail that runs along the field, ending at my cabin door. By the time I had retrieved my stand and completed half of the journey to the trail, the sun's light had ceased, leaving me with only the narrow beam of a flashlight to carry me through the woods to the trail.

When I came within 50 feet of the field, a fluttering of wings broke into my beam revealing a Great-horned Owl grasping what I thought was a Ruffed Grouse in his talons. I stood there fascinated at what was happening not ten feet in front of me when the owl, disturbed by my close presence, flew to a perch leaving his catch for me to examine. To my surprise it was not a Ruffed Grouse, as I first assumed, but a freshly killed adult Red-tailed Hawk.

I examined the body which was intact except for its head and satisfied myself that the bird had been shot. I removed two tail feathers, and quickly left the scene, leaving the hawk for the owl, who was patiently waiting in his perch to retrieve his kill.—*Andrew W. Zovnic, 712 N. Washington St., De Pere, WI 54115.*

Snowy Owl (*Nyctea scandiaca*)

4 July 1990, Calumet County.—I received a call from my friend, Officer Mark Growe of the New Holstein Police Dept., at 7:00 A.M. on July the 4th. He told me he had observed a Snowy Owl throughout the night at the local airport. Each time his rounds had brought him to the vicinity of the airport he had spotted the owl. He wanted me to go to the airport with him to confirm the sighting and to use my binoculars to better see the bird. I held my excitement in check, knowing that it was unlikely that he had indeed seen a Snowy this time of year. When

we arrived at the airport, it was perched on top of a hangar and it was, indeed, a Snowy Owl. It had the large size, round yellow eyes, white color, lightly speckled shoulders and breast, and lack of ear tufts that mark a Snowy. We observed the bird for about 15 minutes from the car, photographing it as well. We drew closer and the bird took flight, landing again 2 hangars down. We watched for another several minutes before it flew off to a low stone pile across a field.

I returned home and called Carol Rudy (Chilton). She and her husband, Martin, drove over and at 10:00 A.M. we returned to the airport and saw the owl sitting on the stone. It was sitting very erect and was panting in the extreme heat (temperatures reached the mid-90's that day). After 20 minutes I left them and went home. Over the course of the next several days I observed the owl at different times during the day.

At one time, in the mid-afternoon, it appeared to be hunting, flying in low, loopy sweeps over a field at the end of the runway. Another time it appeared to be dozing, eyes half-closed and wing relaxed at an angle (it was then on top of a hangar). The only sound I heard it make was a sharp "hack!". With neck outstretched it seemed to be "coughing up" something (perhaps a pellet).

The airport manager, Jack Schneiderwind, said he had seen the bird for about a week prior to the 4th. Often, as he approached the runway to land an airplane, it had "just lifted up and soared" over to a nearby hangar.

I could observe no bands on the bird though I could see its feathered legs quite well. It seemed able to fly well and its feathers were a little "off-white" matching the color of the nearby road bed (Hwy. 57 was being resurfaced at the time).

The last time I saw the bird was during a light shower. It was, again, on a hangar and was hunched down looking as miserable as anyone caught out in the rain. It periodically shook itself all over to remove water and then settled back down to wait out the storm.—*Paula H. Settle, 1911 Madison St., New Holstein, WI 53061.*

GREAT GRAY OWL (*Strix nebulosa*)

3 July 1990, Ashland County.—An adult Great Gray Owl was seen at the edge of a beaver pond. Its very large size, large facial disk, and white mustaches were noted. These key characters could easily be seen with binoculars. The owl was not easily spooked and allowed photos to be taken. After seeing the bird, we walked into the forest. We heard young owls begging for food and saw three young. They still had some down, but were nearly adult size.—*Julie Van Stappen, Apostle Islands National Lakeshore, Route 1, Box 4, Bayfield, WI 54814.*

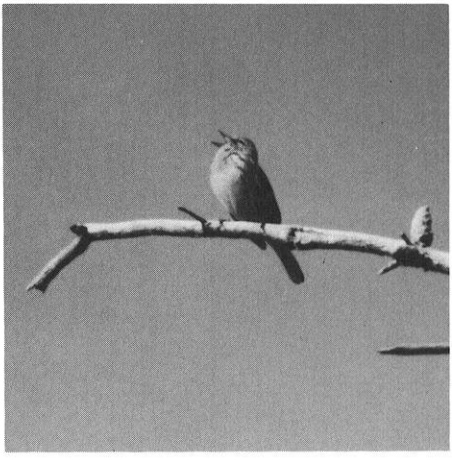
GREAT GRAY OWL (*Strix nebulosa*)

28 June 1990, Douglas County.—On June 28, 1990, Mike Cramey, a Dept. of Natural Resources employee, informed me that he had just brought an injured Great Gray Owl to Project H.A.W.K., a local rehabilitation center in Hayward. The bird, found in central Douglas County on County Trunk A, was extremely emaciated and had apparently been hit by a car. Fortunately the bird was capable of recovery and was in shape for release on July 21. Just prior to release, it was banded

with a U.S. Fish and Wildlife Service leg band and all physical traits were noted. The owl was an adult and apparently a male. All field marks were observed, very large size, overall gray color, yellow eyes, yellow bill, white crescents between the eyes, concentric rings radiating throughout the face, and vertical dark streaking on the breast. Photographs were taken at release. This represents one of the few summer records of Great Gray Owls in Wisconsin. No evidence of nesting was found but it is certainly suspected due to the prime Great Gray breeding habitat in which it was found.—*Larry Semo, Rt. 2, Box 435, Superior, WI 54880.*

KIRTLAND'S WARBLER (*Dendroica kirtlandii*)

10 June 1990, Jackson County.—Aside from the enclosed photographs, I would describe the bird as a rather large, sedentary warbler frequently foraging from elevated perches for up to 15 minutes. It's one of those conspicuously blue-backed warblers, like a Canada Warbler, except there was some black streaking. In other ways it also resembled a Canada, having a conspicuous eye ring, yellow throat, breast and belly. Unlike the Canada Warbler, however, there was no complete "necklace" of black streaks on the upper breast. The conspicuous black, broad streaks were confined to the sides of the breast and flanks. The song is distinct, though difficult to describe. It is "coarse," rather buzzy—sweet, beginning with several introductory notes, ascending musically in tone, and ending quickly.—*Fred Lesher, 509 Winona St., La Crosse, WI 54603.*



Kirtland's Warbler, 10 June 1990, Jackson Co. (*photo by Fred Lesher*)

"Scarlet Song" *by Jerry Gadamus* (A limited edition print reprinted with the permission of the artist and the publisher, Northwoods Craftsman, Menomonee Falls, WI 53051).

ABOUT THE AUTHORS AND ARTISTS

Scott R. Craven is an Associate Professor and Extension Wildlife Specialist in the UW-Madison's Department of Wildlife Ecology. He is well known to naturalists around the state for his extension publications and radio shows. He is particularly interested in urban wildlife and wildlife damage problems.

Eric Epstein is one of Wisconsin's outstanding all-around naturalists. He uses his intensive knowledge of Wisconsin's biological diversity in his job with the Natural Heritage Inventory Program of the Wisconsin DNR and the Wisconsin Chapter of The Nature Conservancy.

Jerry Gadamus has a B.S. degree from UW-Stout where he has instructed wildlife carving classes. A pioneer in the techniques of "free hand" airbrush in wildlife art, he received the 1987 "Artist of the Year Award" from Northwoods Craftsman, who publishes his art.

William L. Hilsenhoff is a Professor in the UW-Madison's Department of Entomology. He has been summarizing Wisconsin's Christmas Bird Counts each year since 1966. He has received WSO's Silver Passenger Pigeon Award for these contributions.

Randy M. Hoffman is our current president. He is a biologist with the Wisconsin DNR's Bureau of Endangered Resources and The Nature Conservancy where he is in charge of managing State Natural Areas.

Barbara Kranich is currently President of The Benjamin S. Goss Bird Club. She has her B.A. degree from the University of Illinois and was a mathematics teacher. She has been an active birder for nearly 30 years.

Michael J. Mossman is a Wildlife Research Biologist with the Wisconsin DNR's Bureau of Research. He has a M.S. degree in Wildlife Ecology from the UW-Madison. He is well known to WSO members with whom he has carried out many cooperative research projects.

Michael James Riddet was born in England and has his B.S. degree in biology from Roosevelt University. In 1983 he received first place in The National Wildlife Federation's "Wildlife

in Art" exhibition. He now lives in Boscobel.

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

Thomas R. Schultz, cochair of WSO's Field Trip Committee, is one of Wisconsin's finest wildlife artists and a frequent contributor to *The Passenger Pigeon.* He has illustrated several books, including The National Geographic Society's field guide.

Daryl D. Tessen remains one of Wisconsin's most active birders, despite living out of state. He has been the long-time Associate Editor of *The Passenger Pigeon* and recently edited the 3rd Edition of *Wisconsin's Favorite Bird Haunts.* He is a recipient of WSO's Silver Passenger Pigeon Award.

Thomas J. Ziebell is a native of Oshkosh who earned his M.S. degree in Biology at UW-Oshkosh, studying Black-crowned Night-herons. His interests in wetland birds have resulted in several articles in *The Passenger Pigeon.* He is currently working as an editor.

Scott Zoellick graduated from the Milwaukee Institute of Art and Design and spent three years studying art at UW-Stevens Point. He was the 1987 "Artist of the Year" for the Wildlife and Western Art Exhibition in Minneapolis.

NOTICES AND ADVERTISEMENTS

THE WISCONSIN SOCIETY FOR ORNITHOLOGY

The Wisconsin Society for Ornithology is an educational and scientific non-profit organization founded in 1939 "to encourage the study of Wisconsin birds." The Society achieves this goal through programs in research, education, conservation, and publication.

OFFICERS (1990–91)

President*: Randy M. Hoffman, 305 Fifth Street, Waunakee, WI 53597 (608-849-4502)
Vice President*: Allen K. Shea, 2202 Manor Green Drive, Madison, WI 53711 (608-274-8380)
Secretary*: Carl G. Hayssen, Jr., 6855 North Highway 83, Hartland, WI 53029 (414-966-2839)
Treasurer*: Alex F. Kailing, W330 N8275 West Shore Drive, Hartland, WI 53029 (414-966-1072)
Editor*: Stanley A. Temple, Department of Wildlife Ecology, University of Wisconsin, Madison, WI 53706 (home, 608-795-4226; office, 608-263-6827)

COMMITTEE CHAIRS (1990–91)

Annual Convention (1991): Thomas Erdman, P.O. Box 631, Green Bay, WI 54301 (414-435-5030)
Associate Editor*: Daryl D. Tessen, 2 Pioneer Park Place, Elgin, IL 60123 (708-695-2464)
Badger Birder*: Mary F. Donald, 6918 North Belmont Lane, Milwaukee, WI 53217 (414-352-8940)
Conservation*: Samuel D. Robbins, Jr., 14 South Roby Road, Madison, WI 53705 (608-233-3581)
Education*: William K. Volkert, Route 3, Box 35, Campbellsport, WI 53010 (414-533-8939)
Field Trips*: Thomas R. Schultz, N6104 Honeysuckle Lane, Green Lake, WI 54941 (414-294-3021) and Jeffrey L. Baughman, Box 219, Adell, WI 53001 (414-626-4713)
File Keeper: Raymond K. Anderson, College of Natural Resources, University of Wisconsin, Stevens Point, WI 54481 (home, 715-824-2866; office, 715-346-3665)
Hotline (414-352-3857): Gerald DeBoer, 2406 Kinzie Avenue, Racine, WI 53405 (414-637-0393)
Lands: Gordon F. Cox, 1004 North Willard Avenue, Janesville, WI 53545 (608-752-8670)
Legal Counsel*: Carlo A. Balistrieri, 163A East Wisconsin Avenue, Oconomowoc, WI 53066 (home, 414-474-7578; office, 414-567-8600)
Loan of Slides: Stephen J. Lang, 5613 Commanche Way, Madison, WI 53704 (608-249-5684)
Membership*: Alex F. Kailing, W330 N8275 West Shore Drive, Hartland, WI 53029 (414-966-1072)
Publicity*: Noel J. Cutright, 3352 Knollwood Road, West Bend, WI 53095 (home, 414-675-2443; office, 414-221-2179)
Records*: Janine L. Polk, 1407 Frederic Street, Eau Claire, WI 54701 (715-839-9265)
Research*: Robert W. Howe, Department of Natural and Applied Sciences, University of Wisconsin, Green Bay, WI 54301 (414-465-2272)
Scholarships and Grants*: John H. Idzikowski, 2558 South Delaware Avenue, Milwaukee, WI 53207 (home, 414-481-6840 or 414-744-4818; work, 414-229-6274)
Supply Department*: Chuck Gilmore, 115 Meadow Wood Drive, Randolph, WI 53956 (414-326-3221)

---

*Members of the Board of Directors

CONTENTS

Volume 53 Spring 1991 Number 1