The passenger pigeon. Vol. 57, No. 3 Fall 1995

Madison, Wis.: Wisconsin Society for Ornithology, Fall 1995

THE PASSENGER PIGEON
Vol. 57 No. 3
Fall 1995

JOURNAL OF THE WISCONSIN SOCIETY FOR ORNITHOLOGY

THE PASSENGER PIGEON
Vol. 57 No. 3
Fall 1995

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

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

The Economics of Birding

On occasion I go birding around the state of Wisconsin (less often than I'd like, probably more often than my husband likes). These trips are sometimes a few hours in length, more often all day, and occasionally overnight. Usually at least one other person goes with me. On day and overnight trips lunches are most often at local restaurants, not of the fast food variety. I frequently wear my binoculars into the restaurant, especially if it has a view which might reveal a bird while we are eating. More often than not, I get into a conversation with the waitresses about bird-watching and birds. They will often mention some particular species that is well known locally, such as the nesting eagles or loons on the lake. When I stay at motels on the overnight trips, and ask for a wake-up call at some unbelievably early hour, I find myself explaining that I'm in the area to look at birds.

Until recently I never gave much thought to this behavior. It was just a way of making contact with a stranger. But in the last year I've read several articles in various birding magazines about the economic impact of birding activities, especially on small rural communities that often lack an established industrial or manufacturing base. Then this past winter I had the opportunity to talk with the members of the chamber of commerce of a small town in Wisconsin which has lots of wildlife areas nearby. Some of the members were amazed that people really do make trips to places to look at birds. Others understood the attraction, but were surprised that their area was special. All were astonished that nature-based tourism could generate so many dollars in a small area. (For example; According to the July/August 1995 issue of *Bird Watcher's Digest*, in an article by Neil A. Case on *Birding Festivals*, $1.5 million dollars was spent at the Festival of the Cranes in Socorro, New Mexico in 1994, and in 1991 80,000 people spent $15 million when they attended the Wings Over the Platte festival in Nebraska.)

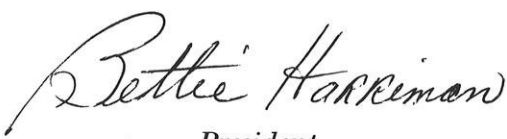
Many towns across America are focusing their tourism efforts on bringing the bird-watchers to their town for an event centered on a particular species--Bald Eagle, crane, avocet, or on groups of birds—shorebirds, waterfowl. It's proving to be big business. Even in areas without a special celerabation, if the birds are there, so are the birders. How many of you go back time and again, year after year to the same areas to look for species you have observed there in the past? I know I have visited Cleveland numerous times looking for those Red-throated Loons, or made several trips to Shiocton to check for shorebirds and swans. I've even run into some of you there.

Why should I, as a birder, care about these towns finding an economic bonanza in birds? The realization by these communities that there is an economic benefit in providing for the birds should translate into habitat

protection. It should make it easier to preserve special places, restore degraded areas, and create new spots which will appeal to the avian population. Considering the current political climate which is insisting that all decisions must be based on what's good for the bank account, it's vital that we can show an economic reason to provide for the birds.

Here's where you and I come in. We need to let the rest of the world (well, at least the rest of Wisconsin) know that we spend money to watch the birds. Wear your binoculars proudly. Tell the waitress, the motel desk clerk, the Quik Mart attendant why you are in their town. And if the birds aren't there next year, you won't be there either. Help them make the connection between providing an area for the birds and their pocketbooks.

I know many of you have worked long and hard on the legislative front to promote protection of habitat, and we must continue to do so, but this is another way we can work to help the birds. It's also the most painless way I can think of to provide for the well being of birds. We are even having fun while helping. So let the world know you watch birds and spend money doing it. Let them know that birds can mean money in the bank. That what's good for the birds is also good for the economy.



President

In the Words of Ornithologists Past . . .

William H. Canfield, Wisconsin Pioneer

by Kenneth I. Lange

One of the most interesting characters associated with Sauk County, Wisconsin, has been William H. Canfield (1819–1913). This pioneer (Figure 1) recorded the early human and natural history of Sauk County in a series of publications (Canfield 1859, 1861–1901), which he often had to finance with his own money. This biographical sketch has been assembled from his writings and other historical accounts, local newspapers on microfilm at the State Historical Society of Wisconsin in Madison, and personal interviews with people, now deceased, who remembered Canfield from their younger years. Also included is a detailed look at his catalogue of local birds (Canfield 1870).

Canfield was a civil engineer and Sauk County's first surveyor. He had a long and productive life and surveyed in virtually every part of the county. On his 80th birthday he finished surveying seven 40-acre parcels on the rugged south bluff by Devil's Lake; returning home, he discovered that friends had been there in his absence and left a present—a rocking chair. The octogenarian said that he was sorry to have missed them, but he appreciated their gift and hoped that he would be able to use it—in his next decade!

In the spring of 1842, at the age of 23, Canfield and his 21 year-old wife emigrated from Lyons, New York, to Sauk County. They walked from Madison to Baraboo by following blazes on trees and a trail—the road had been surveyed but not improved. The young couple settled along Skillet Creek, southwest of Baraboo, where they lived in a "dry-goods box" until a log cabin was finished 6 weeks later. Their household possessions were "dumped off in a pile," and his "only means of support" were his hands and an axe. At first they had no horse, cow, or ox, but Canfield had an expensive watch which he sold for a yoke of oxen. At one time they warded off starvation by subsisting upon the blueberries they could find, but Canfield reminisced: "These were not hard times. The jolly violin was a panacea that drew away gloom and ill health. Buildings and fields all new; people most all young. We visited much and the latch string was

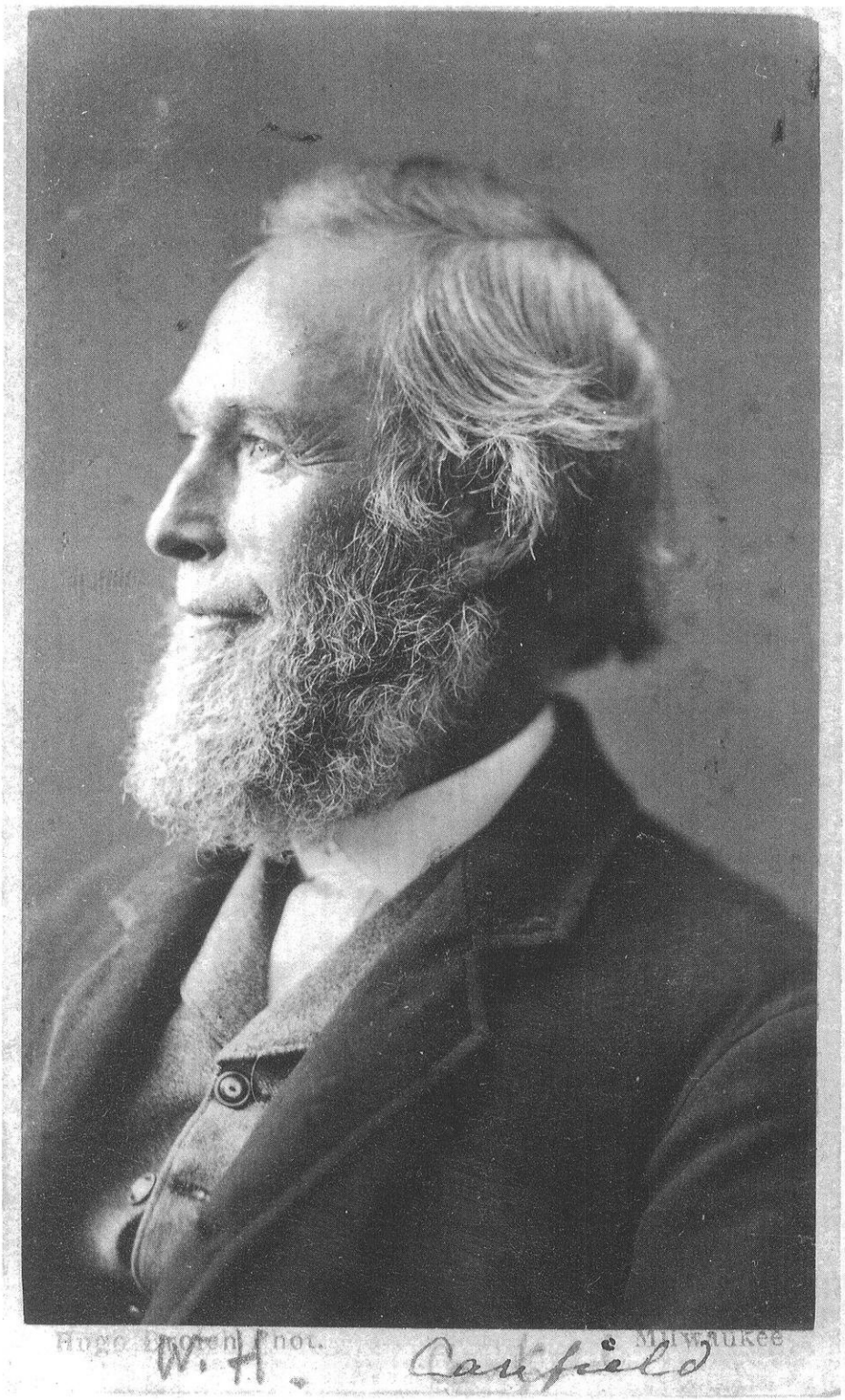


Figure 1. William H. Canfield in approximately 1879. From an album assembled by Increase A. Lapham. Photo courtesy of the State Historical Society of Wisconsin.

out for the new comer" (Old Settlers' Illustrated Souvenir Album, p. 56). Their children were born here. Later they moved to West Baraboo, where the Kwik Trip Store is now located at the junction of highways 12 and 33.

At various times Canfield ran a Baraboo newspaper, engaged in cranberry culture, raised silkworms, and operated a business that made items from willow. He was a Seventh Day Adventist and lived a simple life. In a letter to Increase A. Lapham, Wisconsin's pioneering naturalist and scientist, he wrote: "I am away from home most of my time and do not keep posted in many matters" (Canfield 1856). He did not drink, having only hot or cold water at his table, nor did he smoke, although he once made and sold cigars from his own tobacco.

Canfield was the sparkplug and guiding force of the Old Settlers' Association. In 1903 and 1904 he bought a total of 3 acres of land in what is now Devil's Lake State Park for a meeting place for this group, but the property proved to be too small and never became popular. In descending the twisting road to the southwestern corner of the lake, the property is on the right and about half-way down (Lange and Tuttle 1993; Figures 2–3). A local resident recalled Canfield's visits for the Association: "With old Mr. Canfield, perennial Secretary, taking the place of Santa Claus, I well remember how us boys used to keep close watch down the road for old Pedro, a little sorrel horse bringing the Secretary to stop at our home, as he always did. I recall too, the keen interest I took in listening to him and my father discuss religion, recounting early day experiences or discussing business matters and program for the annual meeting" (Hackett 1963:15–16).

A few people still remembered him when I was interviewing local residents for historical information some 20 years ago. Louis T. Martin farmed near Devil's Lake and Canfield played chess with his father; Martin recalled that Canfield would fill his boots with heated oats after being outdoors all day in winter so as to have dry footgear the following morning. Ernest Haskins of Baraboo said that when Canfield surveyed in marshes he would tie bed-quilts around his legs for protection against massasauga rattlesnakes (*Sistrurus catenatus*). Haskins remembered Canfield as a "nice, pleasant old man," who credited his longevity to leaving the table a little hungry. Ethel Tucker of West Baraboo recalled Canfield lecturing in local grade schools.

Certain fellow citizens sometimes made fun of him, for example in the *Baraboo Republic* for 31 March 1869 where he is called "Canfool." Perhaps some individuals resented his liberal Democratic, opinionated manner. In his obituary in the *Baraboo Weekly News* for 26 June 1913, he is described as "firm in his convictions and most dependable."

His catalogue of birds (Canfield 1870) includes both residents and visitors. He was aided in this endeavor by a number of people, including Charles Deininger of Sauk City. Deininger was a taxidermist and his collection of mounted birds, including a pair of Passenger Pigeons, is now in Baraboo at the Senior High School.

The catalogue includes some introductory remarks on the form and

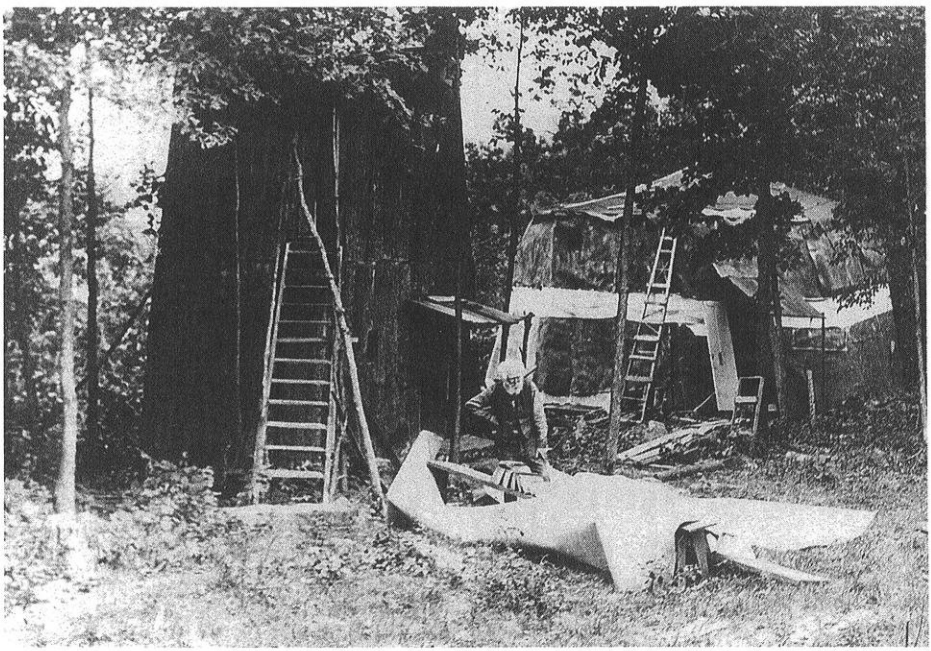


Figure 2. Canfield with his tree house and the Assembly Hall of the Old Settlers' Association at the Association's property near the southwestern corner of Devil's Lake. Photo courtesy of the Wisconsin Department of Natural Resources, Devil's Lake State Park.

beauty of birds and their flight and song. Here are excerpts:

> How beautiful their form! a common expression is, when speaking of anything that in form to our eye is a model, we say, 'that's a bird.' How agile and graceful are their movements! Our sight can hardly follow the humming-bird. When we consider how thin a substance the air is, and how easily birds navigate it, it seems wonderful. See the eagle leave his perch after a graceful flap of the wing which launches him as it were to sea, in the open space; he then soars, or sails without apparent effect, bearing up his heavy body to a height beyond our vision, where he rides at pleasure, using his telescopic eye to watch and select the object of his prey . . . How sweet, pensive, plaintive, bold, synphoneous, delicate their songs! Jenny Lind may try to immolate the bobolink, but father Bob is peerless in his song still, a three ounce wood thrush or a two ounce canary bird [American Goldfinch] gives forth clearer more harmonious and sweeter songs than can man with all his inventions.

The catalogue (Table 1) consists of a total of 182 names, arranged to follow "Tenney's school zoology." It is classified by Orders and Families: Order of Raptors or Birds of Prey (hawks and owls), Order of Scansors or Climbers (cuckoos and woodpeckers), Order of Incessories or Perchers (goatsuckers, hummingbirds, swifts, kingfishers, passerines), Order of Rasores or Scratchers (doves and pigeons, grouse, quail), Order of Grallatores or Waders (cranes, herons, shorebirds, rails), and Order

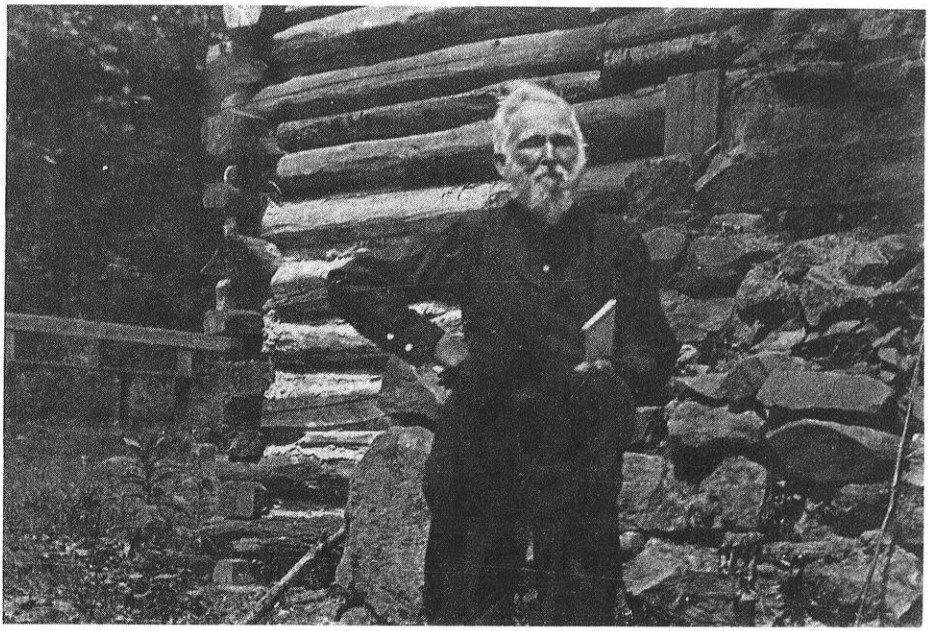


Figure 3. Canfield at the Old Settlers' Cabin on the grounds of the Old Settlers' Association near the southwestern corner of Devil's Lake. Photo courtesy of the Wisconsin Department of Natural Resources, Devil's Lake State Park.

of Natatores or Swimmers (ducks, pelicans, cormorants, gulls and terns, loons).

The catalogue includes a species now extinct (Passenger Pigeon), and a number of extirpated species, such as Greater Prairie-Chicken and Sharp-tailed Grouse. For the Wild Turkey, Canfield commented, "have been in Sauk Co.," although an undated history of Plum Valley (northwestern Sauk County) refers to "plenty of wild turkeys" (Mossman and Lange 1982:144).

Certain species are especially intriguing, in that their presence on the list is likely to be indicative of vanished landscapes. The Long-billed Curlew, for example, probably nested in Sauk County (Robbins 1991:266); the most likely locality is the former Sauk Prairie, an area of approximately 14,000 acres that extended west and northwest of present-day Sauk City and Prairie du Sac (Lange 1990:14). The Yellow-headed Blackbird is also no longer found here; this species probably nested in the Baraboo Valley wetlands complex (Lange 1990:18), where Harold Kruse (personal communication) remembers it from the 1930s. The Yellow-throated Warbler may have occurred farther up the Wisconsin River Valley than it does today, before the bottoms were cut and otherwise altered.

Five boreal species are of interest: Black-backed Three-toed Woodpecker, Boreal Chickadee, Gyrfalcon, Hawk Owl, and Great Gray Owl. Some southern species which occur

Table 1. Canfield's 1870 bird list for Sauk County, Wisconsin.*

	Canfield's name	Current AOU name
Raptors:	Turkey Buzzard	Turkey Vulture
	Duck Hawk or Peregrine Falcon	Peregrine Falcon
	Goss Hawk	Northern Goshawk
	Sparrow Hawk	American Kestrel
	Red tailed Hawk; White brea[s]ted Hawk; American Buzzard	Red-tailed Hawk
	Black Hawk[1]	—
	Marsh Hawk	Northern Harrier
	Sharp shinned Hawk	Sharp-shinned Hawk
	Broad winged Hawk	Broad-winged Hawk
	Rough legged Hawk; Winter Hawk	Rough-legged Hawk
	American Fish Hawk	Osprey
	Bald Eagle or Washington Eagle	Bald Eagle
	Ger Falcon	Gyrfalcon
	Great Horned Owl	Great Horned Owl
	Snowy Owl	Snowy Owl
	Barred Owl	Barred Owl
	Mottled or Screech Owl	Eastern Screech-Owl
	Hawk or day owl	Northern Hawk Owl
	Long eared Owl	Long-eared Owl
	Little Owl	Northern Saw-whet Owl
	Short Eared Owl	Short-eared Owl
	Cinerous Owl	Great Gray Owl
Scansors:	Black Billed Cuckoo	Black-billed Cuckoo
	Yellow-billed Cuckoo	Yellow-billed Cuckoo
	Red headed Woodpecker; Brown-headed Woodpecker[2]	Red-headed Woodpecker
	Pilated Woodpecker or Black Wood-Cock	Pileated Woodpecker
	Golden Winged Woodpecker	Northern Flicker
	Yellow Bellied Woodpecker	Yellow-bellied Sapsucker
	Downey Woodpecker	Downy Woodpecker
	Harry Woodpecker	Hairy Woodpecker
	Red-bellied Woodpecker	Red-bellied Woodpecker
	Black Woodpecker	Black-backed Woodpecker
Insessories:	Ruby-throated Humming-bird	Ruby-throated Hummingbird
	Whippoorwill	Whip-poor-will
	Belted Kingfisher	Belted Kingfisher
	Kingbird or Bee-marten	Eastern Kingbird
	Pewit or Phoebe-bird	Eastern Phoebe
	Wood Pewee	Eastern Wood-Pewee
	Small-headed Pewee	?
	Crested Flycatc[h]er	Great Crested Flycatcher
	Blue Grey Pewee	Blue-gray Gnatcatcher
	Yellow-throated Flycatcher	Yellow-throated Vireo
	Red-eyed Flycatcher	Red-eyed Vireo
	Wood Thrush	Wood Thrush
	Wilson Thrush	Veery
	Hermet Thrush	Hermit Thrush
	Golden-crowned Thrush	Ovenbird
	Common Robin	American Robin
	Blue Bird	Eastern Bluebird
	Maryland Yellow-throat	Common Yellowthroat
	Water Thrush	Louisiana and/or Northern Waterthrush

(continued)

Table 1. *Continued*

Canfield's name	Current AOU name
Black-throated Blue Warbler	Black-throated Blue Warbler
Black-throated Green Warbler	Black-throated Green Warbler
Yellow-rump Warbler	Yellow-rumped Warbler
Yellow-throated Warbler	Yellow-throated Warbler
Black-burnian Warbler	Blackburnian Warbler
Bay-breasted Warbler	Bay-breasted Warbler
Chestnut-sided Warbler	Chestnut-sided Warbler
Black-poll Warbler	Blackpoll Warbler
Yellow-poll Warbler	Yellow Warbler
Black and Yellow Warbler	Magnolia Warbler
Bay Warbler	?
Green Black-cap Fly-catcher	Wilson's Warbler
Red-start	American Redstart
Scarlet Tannager, Red Bird	Scarlet Tanager
Canada Warbler	Canada Warbler
Orange-crowned Warble[r]	Orange-crowned Warbler
Black and White Creeper	Black-and-white Warbler
Barn Swallow	Barn Swallow
Cliff Swallow	Cliff Swallow
White-billed [bellied] Swallow	Tree Swallow
Bank Swallow	Bank Swallow
Chimney Swallow	Chimney Swift
Bohemian Chatterer or Waxwing	Bohemian Waxwing
Ceder Bird	Cedar Waxwing
Great Northern Shrike or Butcher-Bird	Northern Shrike[3]
Cat Bird	Gray Catbird
Brown Thrush	Brown Thrasher
Ruby-crowned Wren	Ruby-crowned Kinglet
House Wren	House Wren
Marsh Wren	Marsh Wren
Wood Wren	Winter Wren?
Golden-crested Wren	Golden-crowned Kinglet
Short-billed Marsh Wren	Sedge Wren
American Creeper	Brown Creeper
White-bellied Nuthatch	White-breasted Nuthatch
Black-cap Titmouse or Chickadee	Black-capped Chickadee
Hudsonian Titmouse	Boreal Chickadee
Skylark or Shore Lark, Prairie Lark	Horned Lark
Evening Grosbeak	Evening Grosbeak
Pine Grosbeak	Pine Grosbeak
Purple Finch	Purple Finch
Yellow or Thistle Bird	American Goldfinch
Red Crossbill	Red Crossbill
White-winged Crossbill	White-winged Crossbill
Lesser Red Poll	Common Redpoll
Snow Bunting	Snow Bunting
Song Sparrow	Song Sparrow
Fox-colored Sparrow	Fox Sparrow
Rose-crested Grosbeak	Rose-breasted Grosbeak
Indigo Bird	Indigo Bunting
Ground-Robin, Towhee or Chewink	Rufous-sided Towhee
Chipping Sparrow	Chipping Sparrow
Field Sparrow	Field Sparrow

(continued)

Table 1. *Continued*

	Canfield's name	Current AOU name
	White-crowned Sparrow	White-crowned Sparrow
	White-throated Sparrow	White-throated Sparrow
	Tree Sparrow	Tree Sparrow
	Black-throated Bunting	Dickcissel
	Snow Bird	Dark-eyed Junco
	Bobolink, Reed or Rice-Bird	Bobolink
	Red-winged Blackbird	Red-winged Blackbird
	Yellow-headed Blackbird	Yellow-headed Blackbird
	Meadow Lark	Eastern (and possibly Western) Meadowlark
	Orchard Oriole	Orchard Oriole
	Baltimore Oriole	Northern Oriole
	Rusty Blackbird	Rusty Blackbird
	Crow Blackbird	Common Grackle
	Common Crow	American Crow
	Blue Jay	Blue Jay
Rasores:	Passenger bird or wild Pigeon	Passenger Pigeon
	Carolina Dove or Turtle Dove	Mourning Dove
	Wild Turkey	Wild Turkey
	Sharp tailed Grouse	Sharp-tailed Grouse
	Pinated Grouse or Prairie Chicken	Greater Prairie-Chicken
	Roughed Grouse or Partridge	Ruffed Grouse
	Quail	Northern Bobwhite
Grallatores:	Sand hill Crane	Sandhill Crane
	Great blue Heron	Great Blue Heron
	Green Heron	Green Heron
	Least Bittern	Least Bittern
	Bittern or stake driver	American Bittern
	Night Heron	Black-crowned Night-Heron
	Golden Plover	American Golden-Plover
	Kill-deer	Killdeer
	Wilsons	Wilson's Plover
	King or semi-palmated Plover	Semipalmated Plover
	Black bellied Plover	Black-bellied Plover
	American Wood Cock	American Woodcock
	Yellow Legs	Greater and/or Lesser Yellowlegs
	Burtranis Sand piper or field Plover	Upland Sandpiper
	Red breasted Snipe	Short-billed Dowitcher
	Common Snipe	Common Snipe
	Long billed Curlew	Long-billed Curlew
	Clapper Rail	King Rail
	Sora or Common Rail	Sora
	Parrie	Sora?
Natatores:	American Swan	Tundra Swan
	Snow Goose	Snow Goose
	Brant	Canada Goose?
	Buffle headed Duck; Butter ball	Bufflehead
	Ring Necked Duck; Ring-necked Scaup	Ring-necked Duck
	White fronted Goose	Greater White-fronted Goose
	Canada or Wild Goose	Canada Goose
	Mallard or Green Headed Duck	Mallard
	B[l]ack Duck	American Black Duck
	Green winged Teal	Green-winged Teal

(continued)

Table 1. *Continued*

Canfield's name	Current AOU name
Blue winged Teal	Blue-winged Teal
Shoveler or Spoon bill	Northern Shoveler
Bald pate or American Widgeon	American Wigeon
Summer Wood Duck	Wood Duck
Big Black headed Duck	Greater Scaup[4]
Red Duck	Redhead
Ruddy Duck	Ruddy Duck
Shell Drake, Goosander, or Fish Duck	Common Merganser
Red breasted Messenger	Red-breasted Merganser
Hooded Merganser	Hooded Merganser
Rough billed Pelicon	American White Pelican
Common Cormorant; Double Crested Cormorant	Double-crested Cormorant
Common American Gull	Ring-billed Gull
Herring [Gull]	Herring Gull
Sooty Tern	Black Tern
Red Tern	?
Great Northern Diver or Loon	Common Loon
Red necked Grebe	Red-necked Grebe

*Semicolons between Canfield names for a given species, e.g. Red-tailed Hawk, indicate that Canfield had entered the names as separate species. [1]Probably a melanistic Red-tailed Hawk or Rough-legged Hawk. [2]Probably the immature Red-headed Woodpecker. [3]Also Loggerhead Shrike? [4]Most likely Lesser Scaup.

in the county today, for example Red-bellied Woodpecker and Blue-gray Gnatcatcher, are listed, whereas others, such as Tufted Titmouse and Northern Cardinal, are not (the common name, Red Bird, usually reserved for the Northern Cardinal, is herein used for the Scarlet Tanager). The northward spread of these species in historic times has been documented for Sauk County (Mossman and Lange 1982).

Canfield included field observations or notes on relative abundance in only a few instances. For the Eastern Kingbird, here called Kingbird or Bee-marten, Canfield comments: "I insist that this bird does catch and eat bees, some authors to the contrary. Mr. E. W. Evans, of our town, stated to me last summer that he had stood beside a white-clover field and saw a kingbird catch and eat many bees that were then at work upon the clover." Of the Horned Lark, which Canfield refers to as Skylark or Shore Lark, "here often called Prairie Lark," there are these notes: "Not the sweet songster of Europe, very common on our prairies. It sings sweetly, but not loud, while on the wing, but its song is short. It rises obliquely from the ground for about forty yards, begins and ends its song, then performs a few evolutions and returns to the ground." Horned Larks originally nested in prairies, but readily switched to the expanding habitat of cultivated fields, pastureland, and fallow fields (Mossman and Lange 1982:101). For the American Redstart, Canfield relates this interesting experience: "When we first moved into the woods in 1842, three miles from Baraboo, a pair of these birds became so tame that they

would perch upon one's shoulders or head. One day one sat quite a while upon a goose-quill pen that I held in my hand."

In 1859, only 21 years after the first non-Native Americans settled in Sauk County, Canfield lamented the changes in the western end of the Baraboo Valley: "But this natural beauty has already gone, only to be remembered; fences, ploughed ground, domestic animals and implements of husbandry now occupy the landscape" (*Baraboo Republic* 26 May 1859). Yet in reminiscing in his 70s about his pioneer years, Canfield (1891:46) extolled the forces that had caused such changes: the building of roads, the stage—first weekly, then tri-weekly, then daily, the telegraph, and "lastly our great railroad." He was moved to exclaim: "Wonderful to contemplate. A volume of one thousand pages would not tell the wonders." One puzzles over this contradiction, but is it any different than lauding our highways while concurrently decrying the loss of open space in modern times?

Canfield's world has become our world. So today what can we say of natural beauty "only to be remembered"? And will future generations still be deploring such loss? Dark thoughts to ponder, but perhaps they can stir us to even greater commitment and effort. For once they are gone, the wild places, they are gone forever.

Acknowledgements

Ernest Haskins, Louis T. Martin, and Ethel Tucker, all now deceased, kindly shared their recollections of Canfield. Michael J. Mossman, wildlife researcher with the Wisconsin Department of Natural Resources, reviewed the manuscript.

Literature Cited

Canfield, W. H. 1856. Letter to I. A. Lapham, 6 Jan. Lapham papers, State Historical Society of Wisconsin, Archives and Manuscripts Room.

Canfield, W. H. 1859. Map of Sauk County Wisconsin. State Historical Society of Wisconsin, Archives and Manuscripts Room.

Canfield, W. H. 1861–1901. Outline sketches of Sauk County. Bound with, as issued: Old Settlers' Association of Sauk County Reports [and] Old Settlers' illustrated souvenir album. Published by author. State Historical Society of Wisconsin Library, Rare Book Collection.

Canfield, W. H. 1870. Catalogue of birds that inhabit or visit Sauk County. Published by author, 3 pp. State Historical Society of Wisconsin Library, Pamphlet Collection, No. 57–1520.

Hackett, G. W. 1963. An early history of North Freedom, Sauk County, Wisconsin. Revised edition. Unpublished paper, 39 pp. State Historical Society of Wisconsin.

Lange, K. I. 1990. A postglacial vegetational history of Sauk County and Caledonia Township, Columbia County, south central Wisconsin. Wisconsin Department of Natural Resources Technical Bulletin No. 168. 40 pp.

Lange, K. I. and R. T. Tuttle. 1993. *A lake where spirits live: a human history of the midwest's most popular park.* 3rd ed. Baraboo Printing, Baraboo, Wisconsin. 85 pp.

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. 196 pp.

Robbins, S. D., Jr. 1991. *Wisconsin birdlife. Population & distribution past & present.* University of Wisconsin Press. 702 pp.

Kenneth I. Lange
Department of Natural Resources
Devil's Lake State Park
Baraboo, WI 53913

Possible Four-Year Cycle in Amount of Calling by Northern Saw-whet Owls

In ten years of auditory censuses during late winter and early spring, the amount of calling by Northern Saw-whet Owls varied dramatically and regularly in an apparent four-year cycle. In years of little calling, owls were still known to be present from sightings and pellets. The authors explore some possible explanations, but this behavior remains unexplained and complicates interpretation of auditory censuses.

by Ann B. Swengel and Scott R. Swengel

Nocturnal and secretive, Northern Saw-whet Owls (*Aegolius acadicus*) ("Saw-whet Owls") are predators of small mammals, especially deer mice (*Peromyscus*) (Johnsgard 1988, Robbins 1991, Cannings 1993). These owls vocalize primarily during the courtship and early breeding season (late winter to early spring), otherwise remaining nearly mute. Migrant banding studies, especially in fall, indicate that Saw-whet Owls are much more common than sight and sound records indicate. Individuals are hard to see during the day in the dense cover of their roosting sites and few observers frequent this small owl's forest habitats during its vocal period.

Auditory censuses of nocturnal owls produce valuable distributional and abundance data, but can be confounded by the species' vocal behavior. The first year of our auditory censusing for Saw-whet Owls was described in Swengel and Swengel (1986), with additional details in Swengel and Swengel (1987). Swengel (1987a) briefly mentioned an apparent annual variation in amount of Saw-whet Owl calling. In 1986, the peak census yielded nearly the total number of individuals ever detected in the study areas in the entire study season by any means (vocalizations, sightings, pellets). By contrast, in 1987 we heard very little calling and detected more Saw-whet Owls during the census period from sightings and pellets. Based on one decade's auditory censusing we report here on a possible four-year cycle in the amount of Saw-whet Owl calling, which complicates the interpretation of auditory censuses.

Methods

Each year during 1986–95, we conducted auditory censuses for Saw-whet Owls at three study areas in the Baraboo Hills, Sauk County, southwestern Wisconsin (43°23′ to 43°34′N, 89°41′ to 89°49′W). Baxter's Hollow is a stream gorge with mixed deciduous-coniferous forest. The south shore of Devil's Lake State Park has rugged terrain with deciduous and deciduous-coniferous forests and some open areas. The Steinke Basin in Devil's Lake State Park contains wet meadow and grassland with scattered pine plantations and oak-pine forest on the perimeter. The study areas are described in more detail in Swengel and Swengel (1987) and Swengel (1992b).

Cannings (1993) mapped these study areas at the southern edge of the Saw-whet Owl's year-round range, but noted that the limits of its breeding and wintering ranges are not accurately known and likely vary annually. This uncertainty and variability result in somewhat different maps for this owl's range. In Robbins (1991), the study areas are on the northern edge of the winter range. Several Saw-whet Owl breeding records and summer detections exist for Sauk County and environs, as reviewed in Swengel (1987b) and summarized by Robbins (1991). But most Saw-whet Owl records from southern Wisconsin occur in the winter and early spring (Swengel 1987b), so that it is difficult to determine how many individuals are wintering, migratory, or resident.

Fixed listening stations (stops) were spaced 100 m apart along four set walking routes totaling 9 km in 1986, then 12–14 km in 1987–95. Two routes totaling 7.2 km at Devil's Lake State Park south shore are mapped in Swengel and Swengel (1987). At each station in 1986, then at alternate stations 1987–95 we played 20 sec of taped Saw-whet Owl song with a cassette recorder, paused 1 min to listen, played another 20 sec of song, and paused again 1 min to listen. Censuses occurred on evenings after sunset with wind <16 km/hr and little or no precipitation. Each station was surveyed up to twice per year, with each survey spaced ≥ 2 weeks apart to minimize owls' accommodation to taped call, which Eastern Screech-Owls (*Otus asio*) have been shown to do (Smith et al. 1987). Throughout the entire study, the first survey period occurred between 13 February and 29 March and the second between 5 March and 27 April. But within a year, the timing of surveys within these two periods overlapped little or not at all. The years varied in how soon and how much of the routes could be surveyed in each period because of weather and time constraints. Censuses occurred on a minimum of three evenings/yr, with the temperature in the first survey period varying from −11 to 15.5°C and in the second from −10 to 24°C.

At each station for each owl species heard, we recorded the type and direction of each call made by each contact (vocalizing individual) in three time slots: before first tape playback and during/after each of the two tape playbacks. The number of contacts in each time slot was then summed for each species at each station. For this analysis, we did not distinguish whether the same or

different owl individual(s) were calling in subsequent time slots. That is, if the same individual Saw-whet Owl called continuously throughout all three time slots at a station, or if a different individual called in each time slot, both scenarios would be represented by the same number, 3. Thus, this number is an index of the amount of calling we heard, not the number of owls responsible for this calling. These indices were natural log-transformed to allow parametric tests for statistical significance ($P < 0.05$) by analysis of variance (ANOVA) with Scheffe's post-hoc test using ABstat 7.20 computer software (1994 Anderson-Bell, Parker, Colorado).

Results

We heard Saw-whet Owls at 172 out of 884 (20%) stations 1986–95, with a minimum of two different individuals detected each year except in 1988, when only one individual was heard once. The 1986 census along 9 km of transect route yielded 25 different Saw-whet Owl individuals via spot-mapping of calling records, as presented in Swengel and Swengel (1987).

At 140 stations 1986–95, one or more other owl species were heard: Great Horned Owl (*Bubo virginianus*), Eastern Screech-Owl, and Barred Owl (*Strix varia*). We occasionally found Long-eared Owls (*Asio otus*) during diurnal searches for pellets and roosts, but we never heard them on auditory censuses.

The mean index (sum of contacts) of Saw-whet Owls per listening station exhibited regular multi-year variation by an order of magnitude (Fig. 1). An ANOVA of indices from both survey periods indicated that the means in 1986, 1990, and 1994 clustered together as significantly high, 1987–89 and 1992–93 and 1995 clustered together as significantly low, and 1991 was intermediate, not significantly different from any other year.

A possible pattern of lower Saw-whet Owl detection in the second survey period was apparent in some years, particularly when detection was low in the first period. Numerically the difference between the first and second periods was sometimes negligible and rarely significant, but it was noticeable enough especially in low calling years to challenge our already flagging morale. An ANOVA restricted to indices from the first period produced statistically weaker patterns similar to the first ANOVA except that 1986 and 1990 were not significantly higher than 1992 and 1993.

Annual variability in Saw-whet Owl calling was also characterized by distinctly greater vocal volume, duration, and interaction in peak years (1986, 1990, 1994). In such years, one individual could be clearly audible continuously through several stations and antiphonal calling of up to three individuals occasionally occurred. Peak years also produced more approaches toward us by vocalizing individuals, which were sometimes sighted. By contrast, diurnal searches for pellets, roosts, and roosting Saw-whet Owls in these study areas during the auditory census season from 1986 to 1990 (Swengel and Swengel 1992a,b) did not indicate any strong patterns of annual variation in owl abundance.

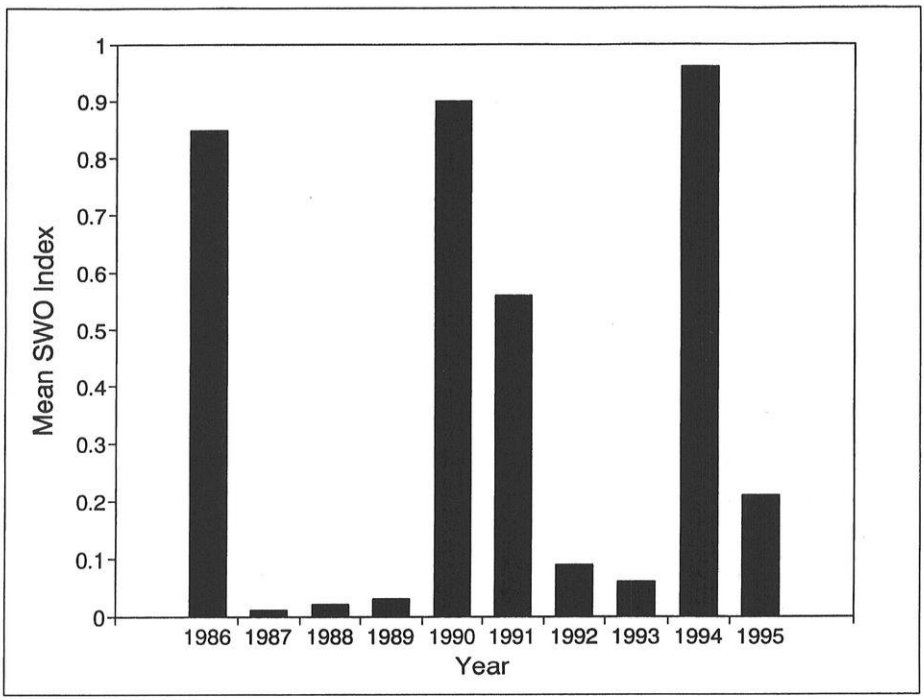


Figure 1. Mean total of Northern Saw-whet Owl contacts per listening station each year in both survey periods.

During this daytime work, we twice heard individuals sing, only in peak calling years (23 March 1986 at 1112 hr and 14 March 1990 at 1101, 1206, and 1207 hr CST).

By contrast, the three other owl species heard on auditory censuses did not show strong patterns of significant annual change or regular cyclicity (Fig. 2). Saw-whet Owl vocalization did not appear inhibited by the calling of these owls, since no pattern of Saw-whet Owl detection was apparent with respect to whether other owls called earlier at, or throughout, a station.

Discussion

Palmer (1987) observed annual variability by an order of magnitude in vocal detection of the Boreal Owl (*Aegolius funereus richardsoni*) during 1980–85 and the Saw-whet Owl during 1981–85 on auditory censuses in Colorado. Boreal Owl indices decreased steadily in 1980–83; Saw-whet Owls showed a similar but somewhat less even pattern during 1981–83. Calling by both species peaked in 1984 and troughed in 1985, corresponding to population fluctuations of voles (*Cleithrionomys* and *Microtus*), which increased from 1983 to 1984 and crashed in 1985, but not to that of deer mice (*Peromyscus*), which decreased steadily from 1983 to 1985.

Norberg (1987) reviewed the cyclic relationships of prey and northern owls further north than

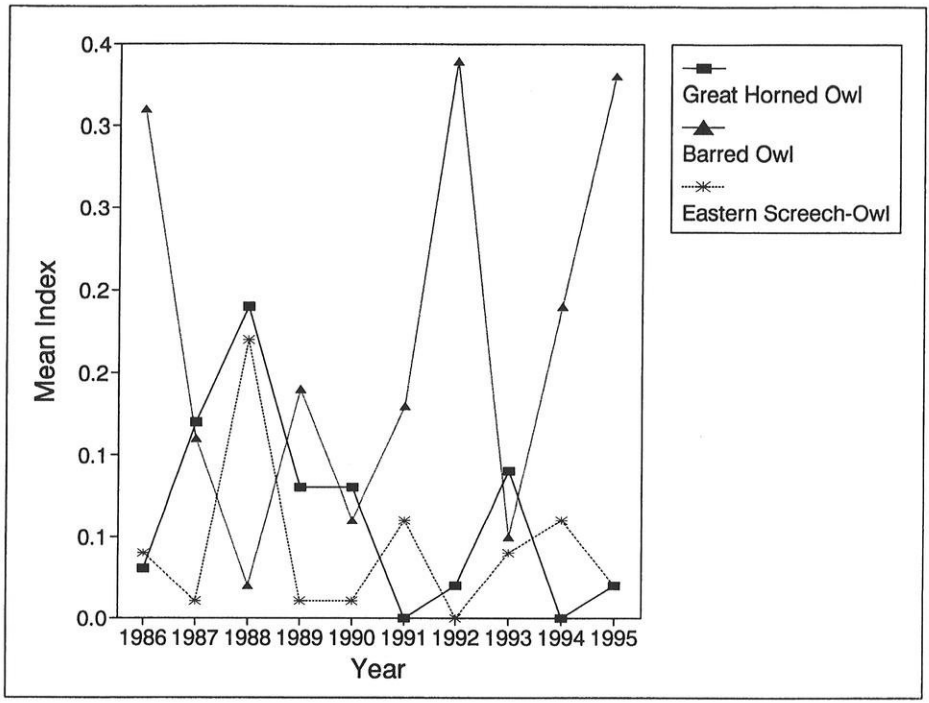


Figure 2. Mean total contacts per listening station per year in both survey periods for Great Horned, Barred, and Eastern Screech-Owls.

Wisconsin. Mice, voles, and lemmings at high latitudes exhibit dramatic population fluctuations, which their predators track. The period averages about four years but shorter and longer intervals sometimes occur; the further north, the greater the amplitude. In areas where small rodents are strongly cyclic, the owls most specialized to prey on them tend to be the most nomadic, while sympatric owls of more generalized diet show greater site tenacity. Some species have a mixed strategy, such as the Tengmalm's Owl (*Aegolius f. funereus*), with females more nomadic (irruptive) than males. In response to prey fluctuations, northern owls are also very flexible in their annual breeding (clutch size, number fledged, whether breeding is attempted).

Annual indices for Saw-whet Owl abundance in most migrational banding studies also show dramatic but regionally desynchronized variability with periods of 3–5 years in most but not all studies. These include fall studies at Cape May Point, New Jersey (Clark 1974, 1976; Duffy and Kerlinger 1992); Duluth, Minnesota (Evans 1975, Evans and Rosenfield 1987); Prince Edward Point, Ontario (Weir 1983); and Cedar Grove, Wisconsin (Mueller and Berger 1967). Spring studies occurred at Toronto, Ontario (Catling 1971) and Whitefish Point, Michigan (Kelley

and Roberts 1971, Carpenter 1987). This annual variability is so dramatic that it cannot be accounted for simply as variation in observer effort and weather conditions among years. But reported results in all regions were too short in timespan (as our study also is) to prove true cyclicity of Saw-whet Owl indices.

The significant differences in annual vocal detection of Saw-whet Owls in this study suggest possible periodicity over an interval of about four years. In 1990, we hypothesized that the next several years might have little calling, with the next peak in 1994. Now that this has occurred, we predict the next trough in 1996–97 and the next peak in 1998. It is unclear whether and how this annual variability in vocal behavior might relate to abundance of migrant, wintering, and/or resident cohorts in the study areas, and to breeding attempts and successes in the areas and further north. Johnsgard's (1988) review did indicate that the size of the fall migratory cohort of Saw-whet Owls is variable, with more substantial numbers moving southward in years of lower rodent populations.

Popp et al. (1988) reported that populations of four small rodent species, including *Peromyscus leucopus,* the primary prey item of Saw-whet Owls in our study areas (Swengel and Swengel 1992a), fluctuated considerably in southern Wisconsin. Yet only *Microtus pennsylvanicus* exhibited true cyclity, with a period of 3–5 years. But other studies indicate that *P. leucopus* can be cyclic north of our study areas (Popp et al. 1988). A rodent cycle in our study areas or north of here, or both or neither, may relate to this calling phenomenon. Whatever the cause, we assume that this annual variability in amount of calling is symptomatic of some other annual variability in Saw-whet Owl biology.

As in Palmer's (1987) study, we have found that the owl populations themselves appear more stable than their calling behavior, since more owls were known to be present than were heard in trough years. Thus, auditory censuses should be conducted for at least four consecutive years to assess owl occurrence in an area, so as to avoid all study years being troughs. If we had not started our auditory censuses in a peak calling year, we doubtless would never have thought we could study Saw-whet Owls here. A year or two of disappointing results in trough years would have been more than sufficient to cause us to abandon the effort. Thus we have chosen to report our observations of regular, seemingly predictable annual variation in the amount of Saw-whet Owl calling now, even though we cannot explain why this happens. It is our hope that others will come forward with observations or initiate studies that will help clarify this phenomenon.

Acknowledgements

We are grateful to Ken Lange, Douglas Trapp, and our sometimes bemused families for helpful encouragement. Richard Cannings, Katharine Duffy, David Evans, and Denver Holt provided many helpful comments on an earlier draft of this paper.

Literature Cited

Cannings, R. J. 1993. Northern Saw-whet Owl (*Aegolius acadicus*). *In* A. Poole and F. Gill (eds.). *The Birds of North America,* no. 42. The Academy of Natural Sciences, Philadelphia; American Ornithologists Union, Washington, D.C.

Carpenter, T. W. 1987. The role of Whitefish Point Bird Observatory in studying spring movements of northern forest owls. Pp. 71–74. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds.). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Catling, P. M. 1971. Spring migration of Saw-whet Owls at Toronto, Ontario. *Bird-Banding* 42:110–114.

Clark, W. S. 1974. Cape May Point Raptor Banding Station—1973 results. *Eastern Bird Banding Association News* 37:51–64.

Clark, W. S. 1976. Cape May Point Raptor Banding Station—1974 results. *North American Bird Banding* 1:5–13.

Duffy, K. and P. Kerlinger. 1992. Autumn owl migration at Cape May Point, New Jersey. *Wilson Bulletin* 104:312–320.

Evans, D. L. 1975. Fall owl migration at Duluth, Minnesota. *Loon* 47:56–58.

Evans, D. L. and R. N. Rosenfield. 1987. Remigial molt in fall migrant Long- eared and Northern Saw-whet Owls. Pp. 209–214. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds.). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Johnsgard, P. A. 1988. *North American Owls: biology and natural history.* Smithsonian Institution Press, Washington, D.C.

Kelley, A. H. and J. O. L. Roberts. 1971. Spring migration of owls at Whitefish Point. *Jack-Pine Warbler* 49:65–70.

Mueller, H. C. and D. D. Berger. 1967. Observations on migrating Saw-whet Owls. *Bird-Banding* 38:120–125.

Norberg, A. 1987. Evolution, structure, and ecology of northern forest owls. Pp. 9–43. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds.). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Palmer, D. A. 1987. Annual, seasonal, and nightly variation in calling activity of Boreal and Northern Saw-whet Owls. Pp. 162–168. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds.). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Popp, J. W., P. E. Matthiae, C. M. Weise, and J. A. Reinartz. 1988. Long- term population fluctuations of small mammals at the UWM Field Station. *Field Station Bulletin* 21(1):10–18.

Robbins, S. D., Jr. 1991. *Wisconsin Birdlife: population & distribution past & present.* University of Wisconsin Press, Madison.

Smith, D. G., A. Devine, and D. Walsh. 1987. Censusing Screech Owls in Southern Connecticut. Pp. 255–267. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds.). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Swengel, A. B. and S. R. Swengel. 1986. An auditory census of Northern Saw- whet Owls (*Aegolius acadicus*) in Sauk County, Wisconsin. *Passenger Pigeon* 48:119–121.

Swengel, A. B. 1987a. Detecting Northern Saw-whet Owls (*Aegolius acadicus*). *Passenger Pigeon* 49:121–126.

Swengel, A. B. 1987b. The habits of the Northern Saw-whet Owl (*Aegolius acadicus*). *Passenger Pigeon* 49:127–133.

Swengel, S. R. and A. B. Swengel. 1987. Study of a Northern Saw-whet Owl population in Sauk County, Wisconsin. Pp. 199–203. *In* R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre (eds). *Biology and conservation of northern forest owls: symposium proceedings.* U.S. Forest Service General Technical Report RM-142.

Swengel, S. R. and A. B. Swengel. 1992a. Diet of Northern Saw-whet Owls in Southern Wisconsin. *Condor* 94:707–711.

Swengel, S. R. and A. B. Swengel. 1992b. Roosts of Northern Saw-whet Owls in Southern Wisconsin. *Condor* 94:699–706.

Weir, R. 1983. Northern Saw-whet Owl studies. *Ontario Bird Banding* 16(3):8–9.

Ann B. Swengel
Scott R. Swengel
909 Birch Street
Baraboo, WI 53913

Black-capped Chickadees '94 *by Michael J. Riddet*
This limited edition print is being used as a fundraiser for the Boscobel Hotel restoration.

Sexual and Postcopulatory Behavior of the Giant Canada Goose

The author attempts to quantify sexual and postcopulatory behavior in Giant Canada Geese. He gathers quantified vocal and visual behavioral data and compares results with earlier studies. His study includes sonographic analysis correlated with behavioral descriptions.

by Dr. Philip C. Whitford

Much has been written about Canada Geese and their behavior in the last half century. Yet, previous reports of Canada Goose sexual behavior have been mostly descriptive and non-quantitative. This is also true for sexual behavior of the Giant Canada Goose sub-species (*Branta canadensis maxima*) though descriptive behavior has been reported for several populations; Dog Lake Manitoba, Balham (1954) and Klopman (1958); Collias and Jahn (1959) for Wisconsin; and Sherwod (1966) for Michigan. Only Klopman (1962) has tried to provide quantitative details for these behavior patterns and that work was based on 22 copulation sequences of Canada Geese of mixed *B. c. interior* and *B. c. canadensis* lineage and observations made in England.

Sexual behavioral sequences described for Canada Geese are similar to those of *Anser* described by Heinroth (1911). He defined the sexual display as comprised of three distinct parts: precopulatory display of mutual neck-dipping in the water; treading and copulation, with the male on the female's back and eventual cloacal contact; and postcopulatory rearing and/or calls while swimming, each to be described in more detail later.

Existing information on sexual behavior from various studies evidenced conflicting conclusions and lacked quantification. Thus, I decided to gather quantified vocal and visual behavioral data and compare observations of my dissertation study birds with earlier reports. Emphasis of my dissertation was on sonographic analysis of vocalizations of *B. c. maxima* correlated with detailed behavioral descriptions (Whitford 1987). That allowed me to collect, sonograph and analyze calls used in sexual behavior to supplement past

phonetic description. My purpose in this paper is to augment Klopman's 1962 data and to compare my results with his and with descriptions provided by others. This may permit insight into behavioral variation between populations and help clarify conflicting points in past descriptions. I hoped to resolve several areas of behavioral contradictions described by previous authors: 1) whether Neck-dipping was synchronous or alternating; 2) whether an increase in overall rate of neck-dipping was standard and/or necessary for copulation to occur; 3) whether copulation occurs shortly before and/or during egg laying, or whether eggs are fertilized only with stored sperm; 4) to measure real time durations of copulation and treading, to replace prior estimates; and 5) to define calls used in postcopulatory displays.

Methods

Research was conducted at the Milwaukee County Zoological Park, Milwaukee, Wisconsin, within a 49.0 ha enclosure which confined the free-roaming, pinioned, geese to zoo grounds. A 2.0 ha man-made lake and two smaller ponds surrounded by mowed grass (Kentucky bluegrass, *Poa pratensis*) were observation sites for sexual behavior.

Zoo grounds opened at 0930 CST daily, permitting undisturbed observation from 0600 to 0930. Observation was conducted 8 August 1981, to 15 August 1982; four hours per day, either 0600–1000 or 0800–1200, three to four days/week. During the March–May breeding season geese stayed near the water. Observations were increased to 5–6 days per week and extended to 1500 hours two days per week during this period. Observation was via "obtrusive field observation" with no attempt to conceal myself from the study birds (Burghardt 1973).

Principle geese used in this study were captured 7 July 1981, at Silver Lake, Rochester, Minnesota. This Silver Lake flock was used by Hanson (1965) to establish the existence of and define the giant Canada Goose subspecies. Geese were aged and sexed by cloacal examination (Hanson 1965), and 15 yearling birds were obtained (birds in their second summer, Balham 1954). They were pinioned and triple banded with numbered, colored leg bands. Individual geese were identifiable entering or leaving the water by band color sequence. In addition, there were 18 resident "zoo geese" I had measured and weighed [also *B. c. maxima* using Hansen's (1965) criteria], aged, sexed and banded with numbered metal leg tags in September 1980.

Calls and verbal descriptions of behavior were tape-recorded with a Uher Report model 4200 stereo tape recorder, tape speed 9.6 cm/s, with an Electrovoice model 644 directional microphone. Descriptions included date, time of day, identity, posture and actions of the birds involved, initiator and recipient(s). Tapes were transcribed and vocal records of neck-dipping and copulation timed with a stop watch. Intervals between first and last five neck-dip groups within single series were compared to determine whether neck-dipping accelerated. Calls were analyzed with a Kay Ele-

metrics model 6061B sonograph using a 150 Hz filter and 80–8000 Hz setting. Dates of neck-dipping, copulation, nesting activities and hatching were recorded and tabulated. Descriptive statistics were calculated with a Unisonic 1548 calculator.

Precopulatory display sequences were deemed "successful" for the purposes of this study if mounting occurred and copulation was attempted, and did not require evidence of copulation success. Copulation success is normally judged by the presence of a postcopulatory display by the female (Balham 1954). Balham, following Heinroth (1911), considered this "ecstatic pose," the only reliable indicator of successful copulation. This criterion has been used by virtually all authors since Balham. I considered any neck-dipping participated in by both members of a pair to be a "copulation attempt." Unsuccessful attempts included those interrupted or terminated prior to copulation, following McLandress and Raveling (1981). All sexual behavior, from precopulatory neck-dipping through postcopulatory rearing, calling, bathing and preening, were summarized for successful and unsuccessful copulation attempts.

Results and Discussion

In 240 hours of study, 1 March–1 June, I observed 23 successful and 10 unsuccessful precopulatory sequences, summarized in Tables 1 and 2. First copulations observed were 24 March, the last 14 May 1982, corresponding to reports for giant Canada Geese at Horicon Marsh, Wisconsin (Collias and Jahn 1959). In Rochester, Minnesota, this subspecies begins sexual activity in early February on Silver Lake, which is kept open by warm water discharge (McLandress and Raveling 1981). Breeding activity of Canada Geese varies with latitude and subspecies, beginning in January or February in California (Naylor 1953) and March or April for northern Michigan (Sherwood 1966). Naylor (1953) and Sherwood (1966) suggested that two peaks in copulations occur. They hypothesized that the first peak represented established pairs and the second, several weeks later, represented new pairs and/or yearlings. Small sample size precluded meaningful analysis of copulation peaks in my study. However, my data indicated complete overlap in copulation dates of both groups. First breeding season geese began copulation on 24 March and continued to 30 April; older geese began on the same date and continued to 14 May (the final date representing a renesting attempt). Reduced copulation activity was observed 8–15 April during an unseasonal period of cold and snow (20 cm).

Individual pairs were observed to copulate as many as four times over a five week time period (Table 1). I observed four successful copulations by one pair, three by each of two other pairs, extending over five weeks. Since I was present roughly 60% of morning hours during this period, extrapolation implies that a minimum of 4–7 copulations are likely per pair/per nesting season, if sexual behavior is confined largely to mornings as reported (Collias and Jahn 1959), more if it extends

Table 1. Marked birds known to have paired, copulated, and/or nested at the Milwaukee County Zoological Park, 1982. Triple letters indicate newly established pairs, double letters—old pairs.

Birds		Copulation Dates				
Male	Female	Successful	Unsuc.	Nested	Hatched	# Young
YGG	YBG		3/29 4/23(3)	yes	6/4	4
YRR	RRY	3/29 4/23		yes	5/24	4
GRY	YBR	4/13(2)	4/13	yes	no	—
GGY	RS LS	3/24		no	—	—
GGY	BBY	4/13 4/21	4/27	yes	5/26	4
YRG	BGY		4/19	yes	5/25	5
RBY	X and X	4/19 4/23		no	—	—
LS	LS	4/19 4/23	4/19	yes	5/23	6
—	LS	3/29(2) 4/21 5/7		yes	—	—

Unbanded pairs 3/24–5/14: 6 successful, 2 not.* Numbers in parenthesis indicate multiple copulations on those dates. * Unbanded birds known established pairs from 1980 preliminary study.

throughout the day (as my current research indicates it does). This extrapolation implies that per pair copulation rates were more than double those previously reported. Balham (1954) reported that no pair was known to copulate more than three times in a season, all in a single day, if successful, over a month-long period if unsuccessful. Successful copulations were not limited to a single day in my study. The highest rate of copulatory displays I witnessed exceeded 1/hr of observation for 30 adult geese, a much higher rate than the 9/hr/1000 geese reported for a large group of mixed-age birds (McLandress and Raveling 1981). Copulations I observed primarily occurred between 0800 and 1000, agreeing with reports by Klopman (1962) and Collias and Jahn (1959) both of whom stated that most copulations occur before 1000. It is possible (based on my current research) that this observation reflects morning sampling bias resulting from having accepted these author's conclusions, not an actual morning preference for sexual activity on the part of geese.

The last observed copulations for each of four pairs that hatched young, YRR and RRY, LS and LS, GGY and BGY, and YRG and BBY (60% of all successful nesters), preceded hatch dates of their nests by 31, 30, 35, and 36 days, respectively. Given the 28 day incubation period for this subspecies and the 6–8 days required to lay the four (3) and five (1) egg clutches observed for these pairs, this indicates that at least some eggs in each clutch were likely to be

Table 2. Copulatory Behavior and its variability in giant Canada Geese: total cases and percentages for various behaviors from 33 copulation attempts.

Behavior Category	N	%
Copulation attempts, successful	23	70
Copulation attempts, unsuccessful	10	30
Neck-dipping:		
Initiated by male*	20	91
Initiated by female	2	9
Neck-dipping terminated by (unsuccessful attempts):		
Female failure to respond to neck-dip	7	70
Male failure to respond to female dip	0	0
Interference by other geese, either direct (aggression) or indirect (vocal)	3	30
Positions during copulation:		
Male grasps base of neck when mounting	21	92
Male grasps middle of back when mounting	1	4
Male grasps back of head when mounting	1	4
Postcopulatory display (successful copulation):		
Males, rearing	20	96
(Rearing with 1–3 calls)	(7)	(30)
No rearing	1	4
Unknown	(2)	—
Females, rearing	9	39
(Rearing with calls)	(2)	(9)
No rearing	12	52
Unknown	(2)	—
Postcopulatory bathing**		
Males	7	30
Females	19	91
Neither	2	0
Postcopulatory preening:		
Both male and female**	22	100

*Initiator unknown, 11 cases; not included in percentage calculation.

**In 2 cases for bathing and 1 for preening actions were unknown and not counted in percentages; birds went out of sight immediately.

fertilized by freshly deposited sperm. This tends to contradict the generally accepted idea that "eggs of Canada geese usually must be fertilized by stored sperm," Raveling (1978), from copulations during migration, an idea also advanced by Naylor (1953), Balham (1954) and Klopman (1958). Little is known regarding sperm survival in the goose oviducts or the number of copulations necessary to produce a viable clutch of eggs, though sperm survival for 12–15 days has been demonstrated for domestic mallards (Elder and Weller 1954). Storage of sperm may an important fertilization source in northern breeding populations of geese, but is not necessary to invoke for the resident giants in my study that copulated during the egg laying period. Increased copulation just before incubation was also reported by Collias and Jahn (1959) and Mineau and Cooke (1979).

I observed 10 unsuccessful copulation attempts; three in March, five in April, and two in May. Success rates remained about 70% throughout late March and early April. Lev-

els of sexual activity and success evidenced little change from onset until early May. In contrast, McLandress and Raveling (1981) reported an exponential increase in sexual behavior from February through early April with highest success rates (53.6%) in late March declining to 8% in early April. Their much lower observed success rate may have resulted from several factors; a high density of geese causing frequent interruption of precopulatory sequences via aggression; or, presence of large numbers of inexperienced yearling geese which evidence promiscuous and unisex copulations. The latter reportedly begin to be observed later than normal copulation (Kossack 1950; Collias and Jahn 1959). Unisex copulation of yearlings in *Anser* species lack postcopulatory displays (Fischer 1965; Würdinger 1970). If also true for Canada Geese, this might help explain the lower overall success rate (as judged by postcopulatory display presence) and sudden decrease in success rates which McLandress and Raveling (1981) observed in April. My study population had no yearlings by the spring of 1982, all geese being two and a half years or older.

Precopulatory neck-dipping, done in water deeper than six inches, is a visual display for which calling has never been reported. Klopman (1962) described neck-dipping and copulation as follows: Sequences begin with the tail and rump slightly elevated, the neck erect with slight backward curvature. The neck is swept down into the water, bill first; the head enters near the breast and the neck is extended under water. Reversing all movements, the head is withdrawn, raised and held stationary before repetition. If the recipient responds, both birds neck-dip, usually while facing one another and several feet apart. Before copulation the male alters position to be parallel and slightly behind the female. He grasps the female's neck and steps onto her back, partially submerging her. Her head appears to be pushed under by the male causing the rump to be raised, enabling cloacal contact, intromission and coitus. Upon completion the male steps back and off the female. Duration of copulation is variously reported as 15–30 sec (Klopman 1962) or several seconds (Balham 1954).

Postcopulatory display, if performed, follows immediately after copulation, lasts 1–2 sec (Balham 1954) and may include calls. Heinroth (1911) described four components of postcopulatory display for *Anser* species: the breast is raised; the neck erect and arched slightly back; the bill pointed upward; and the wings, partially extended, are raised at the tips while the anterior portion stays in contact with the back. Johnsgard (1962) stated that these displays may be given with or without raising or extension of wings. Postcopulatory display may be performed by either sex.

Postcopulatory bathing involves rocking the body forward such that the head, neck and front of the back are submerged, then lifting the breast and lowering the tail so the water runs over the back. The wings may be shaken and the head rubbed on the back as part of the preening and bathing actions. Postcopulatory preening spreads oils from the oil

gland and uses the bill to smooth feathers ruffled by sexual activity. It is a generally considered a "comfort movement" as defined by McKinney (1965). Bathing and preening normally follow immediately after postcopulatory display.

There was wide variation between my data and other works in some aspects of precopulatory and postcopulatory displays. Males initiated 91% of neck-dipping in my known sex, banded bird study, compared to 83% in Klopman's (1962) and 70% in that of McLandress and Raveling (1981) where sex was not absolutely known. Females terminated precopulatory displays (ceased to respond) on 70% of unsuccessful copulation attempts in both my work and McLandress and Raveling's (1981). Direct aggression and territorial calling by pairs, and/or joining of a second male, were factors that interrupted the remaining 30% of sequences (although such joining was also observed on several occasions when successful copulations occurred). Disruption of precopulation sequences by threats and aggression is common for the species (Collias and Jahn 1959; Klopman 1962).

Durations of 23 successful sexual sequences were recorded. They ranged from 20 sec (14 neck-dips/bird and 3 sec copulation), to 240 sec when neck-dipping was sporadic but uninterrupted. In continuous displays, duration, including copulation, ranged from 20 to 90 sec ($N = 9$, $\bar{X} = 54$ sec) agreeing well with prior studies; 90 sec average (Klopman 1962); 30 sec to 2 minutes (Collias and Jahn 1959). The latter authors indicate 30 min may be required if response is intermittent.

Balham (1954) reported that neck-dipping was first performed out of phase and then in unison as momentum increased. Klopman (1962) reported that synchrony of dipping was rare. My study supports Klopman: of 364 neck-dips preceding successful copulations, none were synchronous. One bird invariably initiated neck-dipping and the other either responded to that neck-dip within the next seconds, or did not respond. (Authors note, my current research on giant Canada Geese in Ohio indicates a high degree of synchrony in that population, so there may be individual population differences in this behavior.) Alternation of neck-dips by participants was the normal pattern observed throughout sequences. Individual females often failed to respond to one or more neck-dips of the male, yet, this did not terminate the displays or cause failure of the sequence, if she resumed response within 5–10 seconds. Male to female neck-dip ratios in successful copulation sequences varied from 1:1, to 4.5:1 ($N = 8$, $\bar{X} = 1.77{:}1$). The highest observed ratio was 91:0 for an unsuccessful attempt where the female failed to respond (not counted as a precopulatory display for this study since only one bird participated).

Initial neck-dipping rates varied between the successful copulation series when comparing only those sequences where I was positive the first five neck-dips were observed for each member of the pair; half the series began at 2–6 sec/dip by the males, half at 1 sec/dip ($N = 8$, $\bar{X} = 1.75$ sec/dip). Numerous authors described neck-dipping as accelerating from initiation to copulation (Bal-

ham 1954; Collias and Jahn 1959; Klopman 1962). Acceleration to nearly twice the initial rate occurred in four observations. However, of four males which began at 1 dip/sec, none accelerated, and one actually slowed to 1.5–3 sec/dip for the final five dips. Terminal rate for males was 0.66–3.0 sec/dip ($N=8$, $\bar{X}=.94$ sec). Initial female neck-dipping rates ranged from 0.5 to 26.0 sec/dip ($N=8$), too variable for a valid mean to be calculated. Terminal rates were 0.75 to 12.0 sec/dip ($N=7$, $\bar{X}=1.08$), when omitting the most sporadicly responding female from the sample. In three copulations observed, female neck-dipping exceeded 1/sec just before mounting, matching the male's rate, yet alternating neck-dips. In two cases the female's rate was 2 sec/dip as these females responded only to every other neck-dip of the male. The final female of the sample responded to only five of the last 15 male neck-dips over a period of 25 sec. Her last two responses were 3 sec apart, each following the male's preceding neck-dips by 0.5 second. No consistent pattern of either male or female acceleration was evident from this data. All in all, neck-dipping was extremely variable at the individual level. Yet, since all data are from successful copulations, it appears that female response rate did not alter copulatory success so long as they did not totally cease to respond. Thus, neither an accelerated rate or protracted male/female matching of neck-dipping was required for successful copulation.

I observed two instances of copulations by unpaired individuals. Such random copulations between unpaired birds have frequently been reported for Canada Geese (Collias and Jahn 1959; Sherwood 1966), Black Brant (Welsh and Sedinger 1990) and Snow Geese (Mineau and Cooke 1979).

Copulation itself (mount and treading, to dismount) varied little. Klopman (1962) determined that males mounted females before grasping them. Males grasped the posterior base of the female's neck in 92% of observed mountings in my study. Total duration of combined treading (standing on the female's back) and copulation in my study ranged from 3 to 15 sec ($N=6$, $\bar{X}=5.0$ sec), less than the 15–30 sec reported by Klopman (1962), but agreeing with the 5–10 sec duration reported by Johnsgard (1965).

I observed postcopulatory displays by males after 96% of copulations. This agrees with McLandress and Raveling's (1981) 91% postcopulatory display rate and Klopman's (1962) 95% male display rate. However, I recorded more than twice Klopman's rate of postcopulatory calling by males, 30% vs 14%. I also observed a higher rate of female postcopulatory display (39%) and calling (10%) by females. When postcopulatory display was performed, male and female rates of calling during the display were roughly equal, one bird calling for every three displays, regardless of sex.

Sonographic analysis of postcopulatory calls was difficult due to recording distance (birds were on the water when calling). Yet, I was able to obtain adequate recordings to produce sonograms of male and female calls both individually and in

duetted postcopulatory calling. These are the first of such calls ever to be published (Figures 1 and 2). Females, whether calling alone or with the male, used only "E" calls, phonetically "hrih," as defined in Whitford (1987). This 0.10 sec call had a mean interval of 0.234 sec between calls for the three examples recorded. The most common male

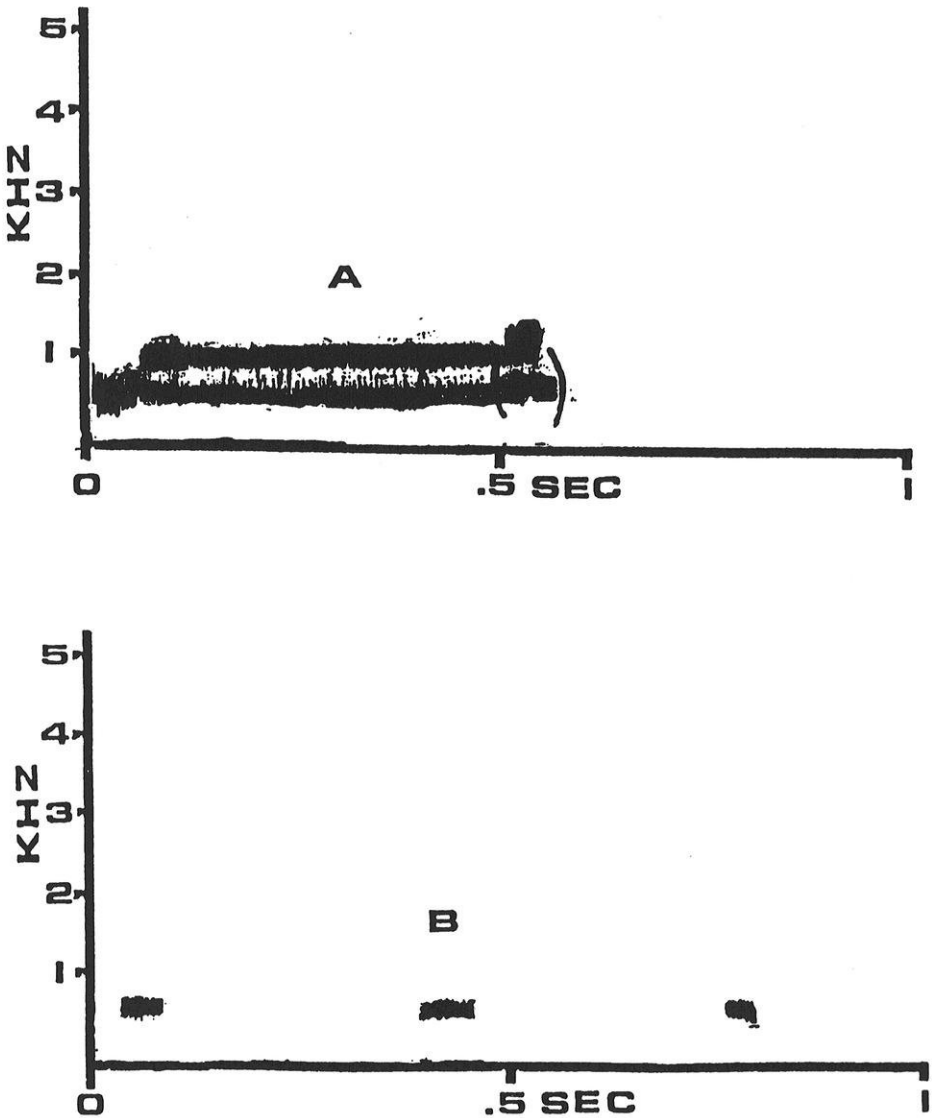


Figure 1. Postcopulatory calls of the male (A) and female (B) giant Canada Goose. The bracket indicates what appears to be the second syllable of a female "E" call superimposed upon the males "G" call.

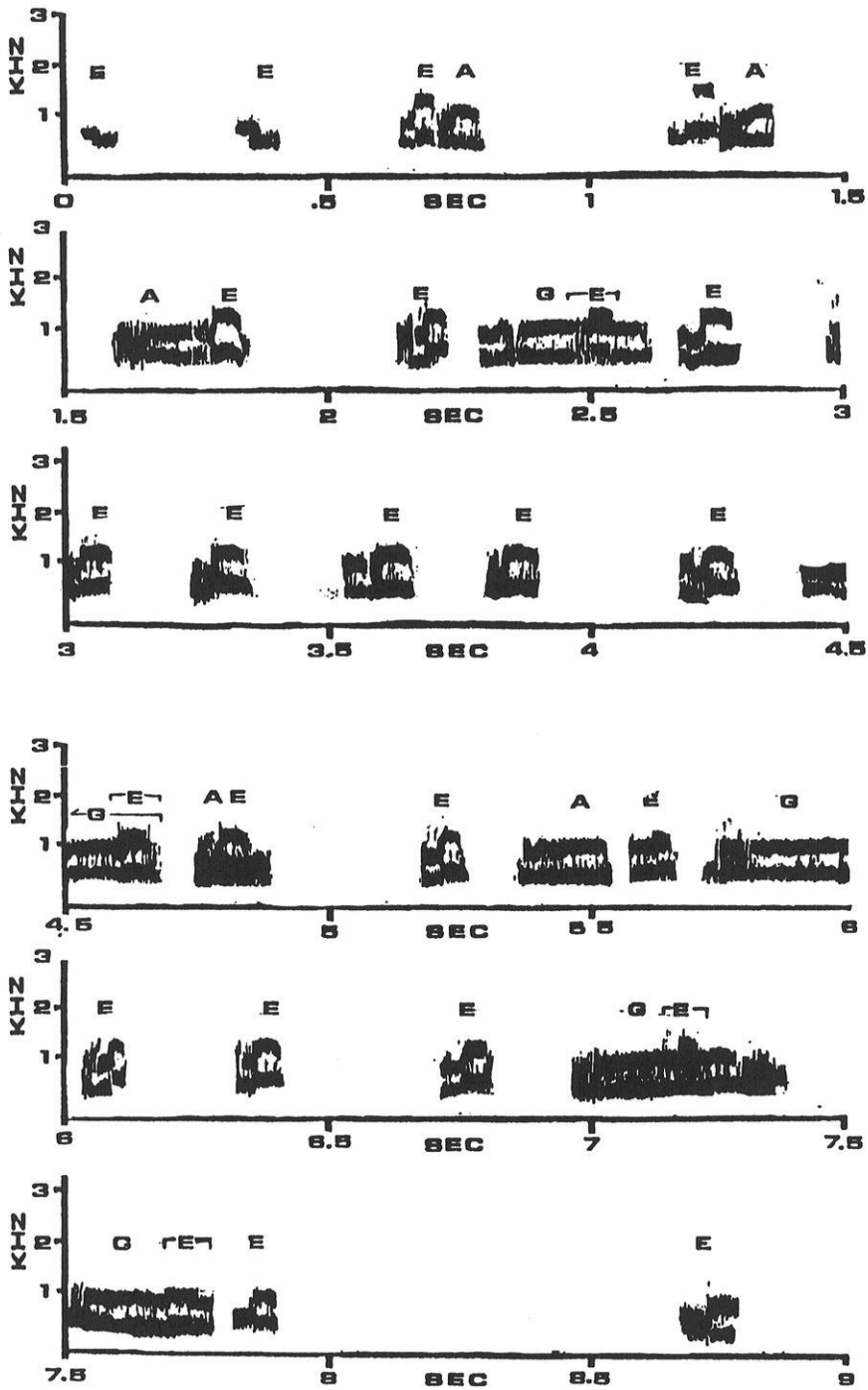


Figure 2. Postcopulatory duet of Giant Canada Geese. Female "E" calls initiate the series, followed by exchange with male "A" calls and ending with the typical male groaning "G" calls with the females "E" calls superimposed.

postcopulatory calls were "G" calls, a 0.50–0.60 sec tonal call with a short, atonal final syllable, phonetically "Hurrrrr" (Whitford 1987). These calls were previously described as "a low wheezy growl" (Balham 1954), a "soft wheezy groan" (Klopman 1962), or a "snore" (Collias and Jahn 1959). Each of these refers only to "G" calls of males. I recorded "G" calls as single calls, in series and as one of two calls used in duetted post-copulatory calling. When used alone the "G" call was repeated up to three times by birds in rearing, postcopulatory posture. When used with other calls, "G" calls were separated by one to three 0.15–0.16 sec "A" calls, "honks," (Whitford 1987) varying from 0.35–0.50 sec in interval between calls. The longest postcopulatory call series recorded was an 8.7 sec duet which incorporated nine "A" and three "G" calls by the male and 24 "E" calls by the female. Postcopulatory duet form was randomly overlapping "A," "G" and "E" calls, not the antiphonal, alternating duetted calls typical of Triumph, Territorial and Aggressive displays (Whitford 1987).

Sonographic analysis indicates that the "snore call" described by Collias and Jahn (1959) as used for both triumph displays (greetings) and postcopulatory calling is actually two separate calls, quite different in form and usage. The "snore call" which follows triumph displays is harsher, more broad spectrum, evidences a distinct descent in frequency and is 2–3 times longer in duration than that used in postcopulatory display. I suggest that the "snore call" designation be reserved for the final call of triumph displays, my "L" call (Whitford 1987). The call used in postcopulatory displays is definitely the shorter "G," or threat, call common in aggression-based behavior.

Postcopulatory bathing is a comfort movement that functions to straighten feathers after copulation (McKinney 1965), but reports conflict as to sexes involved and sequence of actions. Balham (1954) reported that both birds always participated in post-copulatory bathing and males flap vigorously before bathing. Collias and Jahn (1959) reported the male wing-flaps and only the female bathes and Klopman (1962) reported no instances of postcopulatory bathing by males. My observations agree with Klopman's (1962) data for females and indicate that more than 90% bathed after copulation and before preening. Males bathed following copulation in 30% of my observations, but never when the female did not. Postcopulatory preening by both male and female was observed following all copulations. It may continue for up to 1/2 hr after copulation (Balham 1954).

Conclusions

The rates of male initiation and female termination of neck-dipping were virtually identical between my study, McLandress and Raveling's (1981) work with the same subspecies, and Klopman's (1962) work with *B. c. canadensis* hybrids. Postcopulatory display rates of males did not differ between my study and those reported by others. Therefore, all these behavioral rates are probably fairly standard among large Can-

ada Goose races. Postcopulatory calls were given by both sexes, either alone or in duetted form.

Neck-dipping within this population was distinctly asynchronous and may be initiated at a low or high rate, accelerate or maintain a slow sporadic rate, vary in male/female neck-dip ratio and still result in copulation.

I observed more than double the reported rate of copulations/bird present/hour, and a higher copulation success rate/initiation than has been reported previously. I believe this difference may be explained by differences in study population age structures and densities, but more work is needed on this aspect of Canada Goose behavior. Timing of copulations for at least three pairs coincided with egg laying indicating probable egg fertilization by freshly deposited, rather than stored, sperm.

Much more quantitative study needs to be done on Canada Goose sexual behavior to finally define how much variation occurs between races and populations of these birds.

Acknowledgements

I wish acknowledge the kind assistance of Dr. Gilbert Boese, Director of the Milwaukee Zoological Park and all the Zoo staff who assisted my work for making this study possible. I also wish to thank my major professor, Dr. Milliscent Ficken, and my dissertation committee members at UW-Milwaukee for their comments and input on this research.

Literature Cited

Balham, R. W. 1954. The behavior of the Canada goose (*Branta canadensis*) in Manitoba. Dissertation, University of Missouri, Columbia, MO. 229 pp.

Burghardt, G. M. 1973. Instinct and behavior: toward an ethological psychology. Pp. 103–121. *In* J. A. Nevin (ed.). *The Study of Behavior.* Scott Foresman, Glenview, IL.

Collias, N. E. and L. J. Jahn. 1959. Social behavior and breeding success in Canada Geese (*Branta canadensis*) confined in semi-natural conditions. *Auk* 76(4):478–509.

Elder, W. H. and M. W. Weller. 1954. Duration of fertility in the domestic mallard after isolation from the drake. *Journal of Wildlife Management* 18:495–502.

Fischer, H. 1965. Das Triumphgeschrei der Graugans (*Anser anser*). *Z. Tierpsychol.* 22:247–304.

Hanson, H. 1965. *The Giant Canada Goose.* Southern Illinois University Press, Carbondale, IL.

Heinroth, O. 1911. Beitrage zur Biologie, namentlich Ethologie und Psychologie der Anatiden. Verh. V Int. Ornith. Kongr., Berlin, 1910. Pp. 589–702.

Johnsgard, P. A. 1962. Evolutionary trends in the behavior and morphology of the Anatidae. Thirteenth Annual Report of the Wildfowl Trust. Slimbridge, England.

Johnsgard, P. A. 1965. *Handbook of Waterfowl Behavior.* Cornell University Press, Ithaca, NY.

Klopman, R. B. 1958. The nesting of the Canada goose at Dog Lake, Manitoba. *Wilson Bulletin* 70(2):168–183.

Klopman, R. B. 1962. Sexual behavior in the Canada goose. *The Living Bird* 11:123–129.

Kossack, C. W. 1950. Breeding habits of Canada geese under refuge conditions. *American Midland Naturalist* 43(3):627–649.

McKinney, D. F. 1965. The comfort movements of the Anatidae. *Behavior* 25:120–220.

McLandress, M. R. and D. G. Raveling. 1981. Hyperphagia and social behavior of Canada geese prior to spring migration. *Wilson Bulletin* 93(3):310–324.

Mineau, P. and F. Cooke. 1979. Rape in the lesser snow goose. *Behaviour* 70:280–291.

Naylor, A. E. 1953. Production of the Canada goose on Honey Lake Refuge, Lassen County, California. *California Fish and Game* 39:83–94.

Raveling, D. G. 1978. The timing of egg laying by northern geese. *Auk* 95(2):294–303.

Sherwood, G. A. 1966. Canada geese of the Seney National Wildlife Refuge. Dissertation, Utah State University, Logan, UT. 300 pp.

Welsh, D. and J. S. Sedinger. 1990. Extra-pair copulations in Black Brant. *Condor* 92:242–244.

Whitford, P. C. 1987. Vocal and visual communication and other social behavior of giant Canada geese (*Branta canadensis maxima*). Dissertation. University of Wisconsin-Milwaukee. 420 pp.

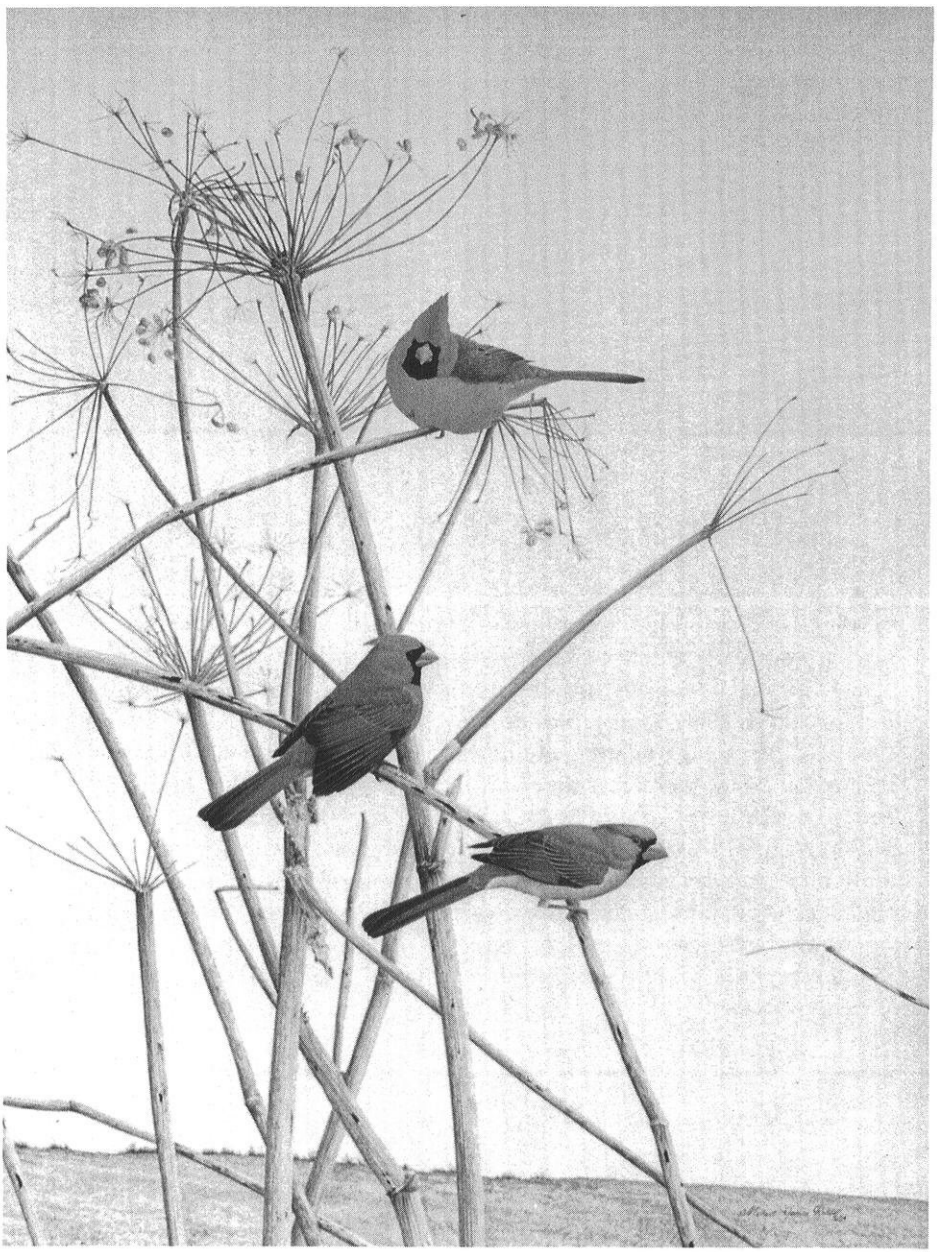
Würdinger, I. 1970. Erzeugung Ontogenie und Funktion der Lautausserungen bei vier Gansearten, (*Anser indicus, A. caerulescens, A. albifrons* und *Branta canadensis*). *Z. Tierpsychol.* 27:257–302.

Dr. Philip C. Whitford
Capital University
Columbus, Ohio 43209

50 Years Ago in *The Passenger Pigeon*

A message in the President's Page is still timely today.

"Our publication has developed under the able guidance of its editor into a journal of which the society may be justly proud: an attractive format as well as interesting literature. It is our desire to continue to improve both form and substance. To do this our members, wherever they are, are urged to contribute articles that to them seem of interest. Let the editorial staff have material to choose from. They are interested in the entire range of ornithological literature—from minor incidents and local lists, to studies of bird behavior, methods of acquiring information, biographical essays, in short, through whatever ramifications the pursuit of bird study leads the mind. It is the exchange of the knowledge that leads to progress and our society desires to be of value to membership by offering excellence in this field." (Excerpts from Volume 7(3)—1945)



Parsnip Field Cardinals '94 *by Michael J. Riddet*

Common Loon Population Changes in Crex Meadows, Wisconsin, 1976–94

Surveys extending over a 19-year period show an apparent increase in Common Loon pairs on the Crex Meadows Wildlife Area. The high production of fledged young makes the area's loon population appear stable.

by James O. Evrard

Zimmer (1982) conducted the first comprehensive survey of breeding Common Loons (*Gavia immer*) in Wisconsin. He estimated that there were approximately 1,300 adult and 260 young loons in 1976–77, primarily restricted to the northern third of the state. Thiel (1978) reported a few additional loons nesting on waterfowl flowages in the Sandhill and Meadow Valley Wildlife Areas in central Wisconsin. Zimmer (op. cit.) concluded that Wisconsin's loon population appeared to be stationary.

In follow-up Wisconsin studies, numbers of breeding Common Loons were thought to have increased from 1976–77 to 1985 (Strong 1988) and remained stable from 1985 to 1990 (Dunn 1992).

In late June and early July of 1976, Work Study Student Edward A. Lombard surveyed a population of Common Loons on the Crex Meadows Wildlife Area (CMWA) as part of a cooperative program between the Wisconsin Department of Natural Resources (WDNR) and the University of Wisconsin-Stevens Point. A severe drought in the Midwest began in 1976 and continued in 1977.

Student Intern Kris Larsen from the University of Wisconsin-River Falls repeated Lombard's CMWA survey in 1977 to assess the impact of the drought upon the loon population (Evrard et al. 1978). Both interns surveyed the CMWA wetlands on nearly a daily basis during the 4-week period in both years. CMWA Project Manager Paul Kooiker conducted similar loon surveys in 1981, 1982, and 1983 (Kooiker 1983) and I conducted loon surveys in 1993 and 1994.

The objective of this study was to document changes in the breeding population of Common Loons on the CMWA over a 19 year period from 1976–1994.

Study Area

The CMWA is located north of the Village of Grantsburg in western Bur-

nett County, Wisconsin. The 10,800 ha wildlife area, managed by the WDNR, is a restored brush prairie-wetland complex described by Vogl (1964) and Zicus (1974). The CMWA contains approximately 1,640 ha (hectare) of open water most of which was created by reflooding drained marshes using dikes and water-control structures.

Methods

Potential loon habitat was surveyed during the months of June, July, and August by observing loons with 7× binoculars and 20× spotting scopes and recording the observations on a map of the CMWA. Research conducted by Belant et al. (1993) on a 5,798 ha water body in northern Wisconsin determined that a single loon census in late June accounted for almost all chicks (94%), but only about half of the territorial adults (56%) due to the inability to classify adults without young and the highly variable number of non-resident adult loons present. However, Meyer (1994) found very few non-resident adult loons on small lakes (<40 ha) in northern Wisconsin.

For these reasons, I censused each wetland on the CMWA that had a potential of supporting loons a minimum of 4 times from May to July in 1993 and 1994. Wetlands with loon chicks were surveyed up to 8 times each year. In 1994, a special effort was made in late July and early August to determine how many loon chicks fledged compared to the number that hatched in order to estimate the fledging rate.

Results

In 1976, Lombard found 7 pairs and 4 lone adult Common Loons (Evrard et al. 1978). The 7 territorial pairs hatched 13 chicks with 9 surviving to flying stage (Table 1). Wetlands occupied by loons totaled 544 ha and ranged from 7–320 ha. Mean density of territorial pairs was 1 pair per 78 ha of occupied wetland with a mean production of 1 fledged young per 60 ha.

During the drought year of 1977, open water on the CMWA shrunk to 35% of normal area by September. By July, Larsen found only 2 territorial pairs of loons which hatched 1 brood of 2 chicks (Table 1). The number of nonbreeding loons rose from 4 in 1976 to 9, including a flock of 5 birds, in 1977.

Loon numbers on the CMWA increased with the return of normal precipitation and water levels in the early 1980s. In 1981, Kooiker (1983) found 7 territorial pairs that hatched 14 young, comparable to 1976 numbers (Table 1). However, the number of pairs and chicks hatched dropped considerably in 1982 and 1983 for unknown reasons.

In 1993, I found 10 territorial pairs that hatched 8 chicks (Table 1). Mean brood size at hatch was 2.0 chicks. The number of loon chicks that fledged was undetermined. Since production appeared to be unexpectedly low, I decided to repeat the survey the following year.

In 1994, there were again 10 territorial loon pairs but the number of chicks hatched rose to 14 (Table 1). I also determined that 9 of the loon chicks survived to flight. Territorial loons occupied 11 of 24 wetlands sur-

Table 1. Number of adult and young Common Loons on Crex Meadows Wildlife Area, 1976–94.

	Adult			Young		Production Indices		
Year	Lone	Paired	Terr. Pairs	Hatched	Fledged	Hatched Yng./Pr.	Fledged Yng./Pr.	Fledged Yng./Ad.
1976[a]	4	14	7	13	9	1.86	1.28	0.50
1977[b]	9	4	2	2	—[c]	1.00	—	—
1981[d]	1	14	7	14	—	2.00	—	—
1982[d]	6	8	4	7	—	1.75	—	—
1983[d]	0	8	4	6	—	1.50	—	—
1993	0	20	10	8	—	0.80	—	—
1994	0	20	10	14	9	1.40	0.90	0.45

[a]Lombard 1976
[b]Larsen 1977
[c]Not known.
[d]Kooiker 1981, 1982, 1983

veyed. These were the same wetlands occupied in 1993 with the exception of a single bird seen once on 1 wetland in 1993 and not in 1994. Occupied wetlands in 1994 totaled 1,140 ha or 78% of the water surveyed. Size of open water in the 11 occupied wetlands ranged from 5–278 ha. Unoccupied wetlands were smaller than occupied wetlands. Size of open water in the 13 unoccupied wetlands ranged from 3–28 ha.

Nine of the 10 territorial pairs were known to have attempted to nest in 1994 and 8 of 10 known nests hatched. One pair lost their first nest but were successful with their second nesting attempt. Brood size at hatch averaged 1.8 chicks. Successful nests were found on wetlands of 6, 16, 19, 36, 66, 183, 258, and 274 ha. Nests were lost on wetlands of 258 and 278 ha. The mean area per territorial pair was 114 ha and the mean production was 1 fledged young per 126 ha.

In both 1993 and 1994, I found only territorial pairs and no lone adults contrary to what was found in previous years (Table 1). During these surveys, I observed single adult loons in previously unoccupied wetlands but concluded that the birds were actually paired territorial loons from other wetlands that were feeding in the wetland under observation. There was no consistent pattern of wetland use by the single loons. This conclusion was backed by numerous observations of single loons flying to and from wetlands occupied by territorial loons during the nesting season. Although I made a single observation of a flock of loons in early May in 1993 and in 1994, I felt these birds were late migrants and not residents.

Discussion

Habitat Preferences—The size of several wetlands (5 and 6 ha) occupied by breeding loons in the CMWA in 1976, 1993 and 1994 was smaller than reported for other areas. Zimmer (1982) found only 5 (3.5%) of 143 Wisconsin lakes smaller than 12 ha supported Common Loons (9

adult, 1 juvenile). In a later Wisconsin study, Dunn (1992) concluded that lakes smaller than 10 ha were not used by loons. In other parts of the Midwest, Sjolander and Agren (1972) and McIntyre (1975) reported that lakes smaller than 12 ha were seldom occupied by loons.

The occupancy of the same wetlands by loons in 1993 and 1994 in the CMWA agrees with the findings of Munroe (1945) in British Columbia. He found loons occupied the same lakes each year and avoided other lakes which appeared to have similar nesting habitat and food resources.

Historical accounts show loons prefer clear, large, and deep lakes devoid of emergent vegetation, but the birds are found in a wide range of habitats (Jung 1991). Although Alvo (1981) stated marshes were not preferred loon habitat in Michigan, Evrard and Bacon (1987) found Common Loons using shallow wetlands ranging in size from 8 to 46 ha in St. Croix County, Wisconsin. One pair of loons they observed nested successfully on a 8 ha wetland. These wetlands were classed as prairie potholes which are highly productive, relatively small, shallow wetlands surrounded primarily by undisturbed grasslands in federal and state Waterfowl Production Areas (Lillie and Evrard 1994). Although subject to occasional fish winterkill, these wetlands supported populations of minnows and larger fish which are important sources of food for loons.

The flowages occupied by loons in the CMWA are also shallow wetlands, subject to periodic fish winterkill, and surrounded by brush prairie (Vogl 1964). These wetlands, although not as biologically productive as those found in St. Croix County, are more fertile than more typical loon habitat of clear, deep lakes in northern Wisconsin. It may be that the higher productivity of the prairie wetlands allows loons to occupy smaller bodies of water compared to infertile northern lakes.

Breeding Densities—Mean territorial pair densities in the CMWA are 2–3× greater than the density (1 pair/258 ha) on the 5,792 ha Turtle-Flambeau Flowage (TFF) in Wisconsin (Belant and Anderson 1991). However, pair densities in the CMWA were less than northwest Ontario (1 pair/52 ha) (Croskery 1990) and east-central Saskatchewan (1 pair/17 ha) (Yonge 1981).

Productivity—Mean hatching success for loons on the CMWA, expressed as young hatched (n=64) per territorial pair (n=44), was 1.45 for the 7 years that these data were available (Table 1). This is very high compared to the mean hatching success of 0.76 (n=147 young, 194 pairs) reported for lakes in Iron, Vilas, and Oneida Counties on northern Wisconsin for 1992–94 by Meyer (1994).

Loon fledgling success of 63% for the CMWA in 1994 was lower than both 73% (Meyer 1994) and 83% (Belant and Anderson 1991) for the TFF in 1986–87. However, the number of young fledged/territorial pair was higher for the CMWA (0.90) than for the TFF (0.73) in 1986–87 and smaller northern Wisconsin lakes (0.56) in 1993–94 (Meyer 1994).

McIntyre (1975) reported a low productivity of 0.27 fledged chicks/

territorial pair in Minnesota. Croskery (1990) also found low productivity in northwestern Ontario with a mean of 0.32 young fledged/territorial pair. Sutcliffe (1980) concluded that 0.50 fledged young/territorial pair of adult loons was the minimum needed to ensure a healthy, stable population.

Loss of chicks from hatch to fledging has been attributed to various causes including abandonment by adults after disturbance by humans; severe storms; predation by raptorial birds, turtles, large predatory fish (McIntyre 1975, Yonge 1981) and mammals including mink (Belant and Anderson 1991); and sibling rivalry (Strong and Hunsicker 1987).

Summary

Results from surveys conducted over a 19-year period on the CMWA show an apparent increase from 7 to 10 territorial pairs of Common Loons. Pair densities were 2–3× greater than recorded on Wisconsin's TFF. Loons occupied smaller wetlands on the CMWA than reported elsewhere, perhaps a response to the higher productivity of prairie wetlands. Loons occupied the same wetlands each year which represented nearly 80% of the available habitat. Production of fledged young on the CMWA was 9 in 1976 and 1994 with considerable variation between those years. CMWA loon productivity in 1994, expressed as number of fledged young/territorial pair, was above that observed on the TFF and on smaller lakes in northern Wisconsin and above that needed to maintain a stable population. The Common Loon population on the CMWA appears to be stable and productive, but perhaps, at the carrying capacity of the available habitat.

Acknowledgements

I thank L. Gregg, M. Meyer, K. Bauer, and G. Bartelt of the Wisconsin Department of Natural Resources for critical review of the manuscript. Partial funding for this study was supplied by Federal Aid to Wildlife Restoration Act under Wisconsin Pittman-Robertson Project W-141-R.

Literature Cited

Alvo, R. 1981. Marsh nesting of common loons (*Gavia immer*). *Canadian Field Naturalist* 95:359.

Belant, J. R. and R. K. Anderson. 1991. Common loon, *Gavia immer,* productivity on a northern Wisconsin impoundment. *Canadian Field Naturalist* 105:29–33.

Belant, J. R., J. F. Olson and R. K. Anderson. 1993. Evaluation of the single survey technique for assessing common loon populations. *Journal of Field Ornithology* 64(1):77–83.

Croskery, P. R. 1990. The importance of individual territories to the long- term production of common loons, *Gavia immer,* in northwestern Ontario. *Canadian Field Naturalist* 104:557–560.

Dunn, T. D. 1992. Status of the common loon in Wisconsin. *Passenger Pigeon* 54(1):19–30.

Evrard, J. and B. Bacon. 1987. Common loon breeding in St. Croix county. *Passenger Pigeon* 49:98–100.

Evrard, J. O., E. A. Lombard, and K. H. Larsen. 1978. Response to drought by a breeding population of common loons. *Passenger Pigeon* 40:418.

Jung, R. E. 1991. Effects of human activities and lake characteristics on the behavior and breeding success of common loons. *Passenger Pigeon* 53(3):207–218.

Kooiker, P. A. 1983. Common loons in Crex Meadows. Unpublished tables filed at Wisconsin Department of Natural Resources, P.O. Box 367, Grantsburg, WI. 5 pp.

Lillie, R. A. and J. O. Evrard. 1994. Influence of macroinvertebrates and macrophytes on waterfowl utilization of wetlands in the

prairie pothole region of northwestern Wisconsin. *Hydrobiologia* 279/280:235–246.

McIntyre, J. W. 1975. Biology and behavior of the Common loon (*Gavia immer*) with reference to its adaptability in a man-altered environment. Ph.D. Dissertation, University of Minnesota. 230 pp.

Meyer, M. W. 1994. Mercury contamination in wildlife. Pp. 87–103. *In* 1993 Annual Report Wisconsin Acid Deposition Monitoring and Evaluation Program. Wisconsin Department of Natural Resources Publication AN-132–94.

Munroe, J. A. 1945. Observations of the loon in the Caribou parklands, British Columbia. *Auk* 62(1):38–49.

Sjolander, S. and G. Algren. 1972. Reproductive behavior of the common loon. *Wilson Bulletin* 84(3):296–308.

Strong, P. I. V. and L. Hunsicker. 1987. Sibling rivalry in common loon chicks. *Passenger Pigeon* 49(3):136–137.

Strong, P. I. V. 1988. Changes in Wisconsin common loon population. *Passenger Pigeon* 50(4):287–290.

Sutcliff, S. A. 1980. Aspects of the nesting ecology of common loons in New Hampshire. M.S. Thesis, University of New Hampshire. 95 pp.

Thiel, R. P. 1978. Common loon breeding activity in the Sandhill and Meadow Valley Wildlife Areas. *Passenger Pigeon* 40(4):512–513.

Vogl, R. J. 1964. Vegetational history of Crex Meadows, a prairie savanna in northwestern Wisconsin. *American Midland Naturalist* 72(1):157–175.

Yonge, K. S. 1981. The breeding cycle and annual production of the Common Loon (*Gavia immer*) in the boreal forest region. M.S. Thesis, University of Manitoba. 141 pp.

Zicus, M. C. 1974. A study of the giant Canada geese (*Branta canadensis maxima*) nesting at Crex Meadows, Wisconsin. M.S. Thesis. University of Minnesota, St. Paul. 116 pp.

Zimmer, G. E. 1982. The status and distribution of the common loon in Wisconsin. *Passenger Pigeon* 44(2):60–66.

James O. Evrard
Wisconsin Department of Natural Resources
P.O. Box 367
Grantsburg, Wisconsin 54840

Lead Poisoning in Canada Geese in Wisconsin: A Continuing Legacy

The history of lead poisoning in Canada Geese is summarized from published and unpublished records.

by William E. Wheeler

Lead poisoning of Canada Geese occurs when geese swallow lead shotgun pellets which were deposited in wetlands or on fields as a result of hunting. The lethal number of pellets ingested per bird has been determined to be 4–5 No. 4 shot (Cook and Trainer 1966). Lead was used for waterfowl hunting in Wisconsin from settlement days until the advent of steel shot and the establishment of non-toxic shot regulations beginning in 1977. The use of lead shot was first prohibited in areas of high waterfowl harvest, primarily the Mississippi River, southeastern Wisconsin, and several state wildlife areas from 1977 to 1986. In 1987, steel shot was required for all waterfowl hunting statewide including ducks, geese, coots, and gallinules. Lead is still being deposited in some wetland areas where game birds and mammals may be hunted with lead shot and near trap and skeet ranges.

Lead poisoning in Canada Geese was first reported in Wisconsin over 50 years ago in 1940 at Swan Lake (Alder 1944) and Mud Lake in Columbia County, and at Green Bay in Brown County (Wis. Dep. Nat. Resourc., unpubl. data). Since these initial reports, major outbreaks occurred in the 1940's at Mud Lake, Dodge County in 1944 (Hartsough 1944), Lake Puckaway, Green Lake County in 1948 (Bellrose 1959), and Mc Comb's Pond, Rock County (Jahn 1949) in 1949. Geese were undoubtedly being subjected to lead poisoning even earlier in Wisconsin as Lesser Scaup were found to be ingesting lead pellets from Lake Puckaway in 1909 (Schillinger and Cottam 1937). Much of the history of lead poisoning in geese seems to follow the chronology of increasing goose concentrations on marshes and refuge areas as populations increased in Wisconsin with the advent of new refuges and protective regulations. Lead poisoning often occurred in winter after hunting stops or in the spring when migrating geese concentrate on traditionally heavily hunted areas with little disturbance.

Early instances of lead poisoning

in geese and ducks encouraged Wisconsin Conservation Department biologists to sample bottom sediments in 1949. This revealed large lead deposits in Lake Puckaway (Green Lake County), Clam Lake (Burnett County), and Horicon Marsh (Dodge County) of 118,000, 48,000 and 4,000 pellets per acre, respectively (Hartmeister and Hansen 1950).

Significant lead poisoning of geese continued in the 1950's and early 1960's with cases occurring in Brown, Columbia, Dodge, Green Lake, Rock, and Winnebago Counties during both spring and fall (Trainer and Hunt 1965). Since these earlier accounts, lead poisoning in Canada Geese has continued with cases in geese occurring almost annually. It is the intent of this paper to summarize published and unpublished records which document the history of lead poisoning in geese by specific site of occurrence.

Methods

Published accounts were used where possible (Alder 1944, Hartsough 1944, Hartmeister and Hansen 1950, Jahn 1949, Trainer and Hunt 1965) but most site specific data were assembled from original data files and correspondence (T. Amundson, G. Eveland, R. Hunt, S. Hurley, L. Jahn, G. Jolin, T. Nigus, M. Rowe, P. Kaiser, and W. Wheeler, of the Wisconsin Department of Natural Resources). Surely other minor instances have gone unrecorded as lead poisoning became quite common place to many Department personnel. Most records listed specific lakes but some were listed only as the number per county. The number of geese affected in each case is often somewhat subjective due to the difficulty of recovering all carcasses. Carcasses examined to verify lead poisoning were listed by year. The number estimated to have died are presented when the field biologist recorded an estimate.

Results

General Perspectives and Site Specific Occurrences of Lead Poisoning of Geese—Lead poisoning of Canada Geese in Wisconsin occurs as the result of ingestion of lead pellets mistaken for seeds or grit. Occurrences prior to the use of steel shot (1977) were the result of either picking up pellets from the current hunting seasons or from past deposits on traditionally hunted areas of heavy hunting activity (Table 1). After 1987, and the statewide requirement for non-toxic (steel) shot for waterfowl hunting, most cases involved the past years' accumulations of or the illegal use of lead shot. Lead poisoning cases during the 1940's and 1950's occurred mostly on popular duck hunting areas and for a variety of reasons, involving only a small number of geese. One reason was that goose populations were quite low as indexed by the number of birds using Horicon Marsh: 500 in 1942, and reaching peaks of 12,000 in 1949 and 72,000 in 1959 (Wis. Dep. Nat. Resourc., unpubl. data). Cases at Green Bay during 1940, 1953, and 1955 probably were locally raised giant Canada Geese nesting in the locality since 1938 (Wheeler and Cole 1990). The early cases on Swan and Mud Lakes in Columbia County

Table 1. Lead poisoning cases at specific Wisconsin sites, 1940–94.

County	Area	Year	Number of geese
BROWN	Green Bay	1940	2
		1953	4
		1955	1
		1961	7
		1965	25
		1974	4
		1981	1
		1983	2
		1987	3
		1989	4
MANITOWOC	Collins Marsh	1976	18
		1992	2
WINNEBAGO	Lake Butte des Mortes	1954	1
	Unknown	1953	5
		1954	2
	Lake Poygan	1954	1
		1964	5
	Rush Lake	1968	1000
		1969	200
		1970	75
		1977	11
		1987	60
		1988	85
		1989	72
MARQUETTE	Unknown	1953	1
	Fox River	1988	1
GREEN LAKE	Green Lake	1975	2
		1976	15
		1980	13
		1981	10
		1983	2
		1986	*
	Lake Puckaway	1948	100
		1954	120
		1958	50
		1964	10
		1968	25
		1980	12
		1981	3000
	Lower Twin Lake	1964	10
	Little Green Lake	1964	10
		1976	7
GREEN LAKE	Grand River Marsh	1953	18
		1954	1
		1981	535
		1983	9
		1984	14
		1985	31
		1989	1
	Lake Maria	1954	70
		1957	47
		1958	50
		1968	107

(continued)

Table 1. *Continued*

County	Area	Year	Number of geese
		1976	105
		1980	16
		1981	341
		1983	13
		1984	1
		1985	3
		1988	1
		1989	5
COLUMBIA	Swan Lake	1940	4
		1954	1
		1968	1
	Mud Lake	1940	3
		1958	200
		1964	5
	WPA/Rowe	1987	1
	Pine Island	1987	1
	Otsego Township	1987	1
	Rowan Creek	1989	1
	Wisconsin River	1993	1
	Fall River Rod & Gun	1994	25
DODGE	Horicon Marsh	1953	2
		1954	2
		1962	400
		1963	200
		1964	15
		1969	*
		1976	44
		1977	8
		1978	1
		1980	1
	Spring Brook Farm	1976	145
	Unknown	1954	10
	Fox Lake	1962	*
		1966	1000
		1968	268
		1976	167
	Beaver Dam Lake	1954	1
		1987	3
		1993	1
	Lake Emily	1964	10
		1968	15
		1976	11
	Mud Lake	1944	100
	Lost Lake	1989	1
	Lake Sinissippi	1991	1
	Sunset Hills Golf Club	1993	1
JEFFERSON	Lake Koshkonong	1949	12
	Lake Mills	1990	1
DANE	Unknown	1954	1
		1961	1
ROCK	Mc Comb's Pond	1949	106
	Rock Prairie	1956	82

(continued)

Table 1. *Continued*

County	Area	Year	Number of geese
WALWORTH	Tripp Lake	1980	1
	Americana Resort	1984	2
	Lake Geneva	1989	3
	Lake Geneva-S. Lakes Trap & Skeet	1992	134
	Lake Delevan	1967	7
	Turtle Creek	1976	1
	Lake Como	1992	1
KENOSHA	Unknown	1984	3
	Lake View Corp	1994	1
WAUKESHA	G.E. Ponds	1993	1
CLARK	Unknown	1993	1
IRON	Mercer	1992	1

*Indicates confirmed lead poisoning but number of geese unknown.

occurred during an extremely dry year (1940) when marsh bottom lead deposits of the heavily hunted areas were unusually accessible to feeding waterfowl. The availability of old deposits during drought years remains a problem today. A substantial die-off in 1949 occurred around the refuge established at Rock Prairie in Rock and Walworth Counties (Table 1). There was a remnant flock using the area which has more recently been identified as giant Canada Geese (Craven 1975). This was one of the first outbreaks of lead poisoning in Wisconsin on an area traditionally hunted for geese.

In the 1950's, most cases were of small numbers of Canada Geese picked up on very heavily hunted duck marshes of Lakes Butte des Mortes, Poygan, Puckaway, Maria, Beaver Dam, Koshkonong, and at impoundments of Horicon and Grand River (Table 1). The 1960's were characterized by increasing goose populations in East-central Wisconsin which reached a peak of 188,000 in 1968 (Wis. Dep. Nat. Resourc. unpubl. data). Concurrent with these peak years were cases of substantial losses in Canada Geese as a result of lead poisoning. Die-offs in the hundreds became common at Horicon Marsh, Lake Maria, and Rush Lake. Two very large die-offs (1,000 estimated geese) were documented in December/January of 1966 and 1968 at Fox Lake and Rush Lake, respectively. These were primarily noted to be large concentrations of sick birds gathered on remaining open water areas after the close of the hunting seasons. At this point in time, it was felt that a large share of the shot being ingested came from the current hunting seasons deposits.

Outbreaks of lead poisoning continued through the 1970's in areas frequented by larger and larger numbers of geese as their populations increased and remained concentrated in East-central Wisconsin (Figure 1). Annual searches for lead poisoned geese after the hunting season became a routine activity in the area surrounding Horicon. Bottom sampling for lead shot by Wis-

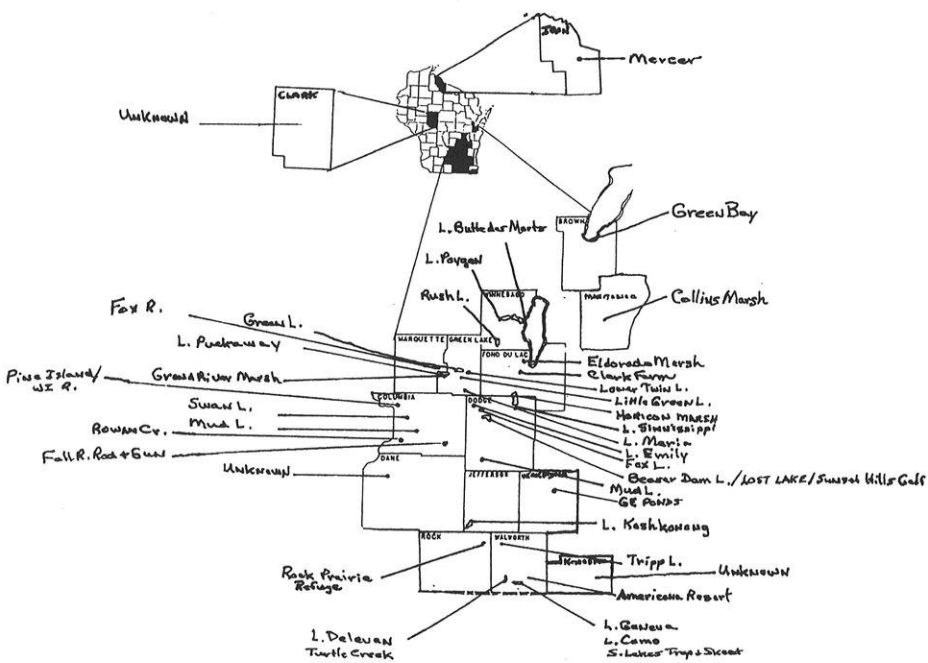


Figure 1. Sites of confirmed lead poisoning in Canada Geese in Wisconsin, 1940–94.

consin Department of Natural Resources biologists continued to document the extent of the problem.

Lead Deposit Sampling and Densities—Rush Lake was sampled in 1969, indicating 69,696 pellets per acre (R. Hunt and J. March, Wis. Dep. Nat. Resourc., unpubl data). Additional sampling in 1980 indicated 29,000 pellets per acre in some parts of the lake and 127,227 pellets per acre in some hard bottom areas (G. Jolin and D. Evensen, Wis. Dep. Nat. Resourc., unpubl. data). Lake Butte des Mortes was sampled in 1967 with 51,400 pellets per acre indicated in the Hog Point area south of the Fox River mouth. The worst area, therefore, contained 1–3 lead pellets per square foot of bottom area. Lake Butte des Mortes was sampled again in 1981 with pellet concentrations varying from 2,004 to 8,712 pellets per acre in other areas. Lakes Maria, Puckaway, and Poygan were also sampled in 1981 and pellet concentrations of 22,215, 7,405 and 8,276 to 30,492, respectively, were found (G. Jolin, B. Eichhorst, Wis. Dep. Nat. Resourc., unpubl. data).

Lead Shot Regulations—Regulations against the use of lead shot for waterfowl hunting in Wisconsin began in 1977 with prohibition of its use in 12 gauge guns in five southeastern counties and along the Mississippi River in 6 counties. In 1978 and 1979, these zones were expanded to 21 southeastern counties and 8 on the Mississippi River. In 1980, the

Wisconsin Legislature cancelled the prohibition rules in most of Wisconsin on the grounds that there was insufficient information to demonstrate lead poisoning was a problem. The Horicon Goose Zone remained a steel shot zone and required steel in all gauges of guns for the first time. The Legislature also required the formation of a citizen advisory Toxic Shot Evaluation Committee. This committee collected from hunters and analyzed 141 goose gizzards from 30 Wisconsin counties and found 10.6% contained ingested shot (Strohmeyer 1982). Seventy-six percent of these gizzards contained lead only, 18% carried steel shot only and 5% held both. As lead was only partially prohibited in 15 of the 30 counties sampled for 2 years, both 1980 deposits and old deposits of lead were still available.

Timing of Outbreaks—Over the years, most outbreaks continued to occur from December through April while migrant geese were still present after the hunting season and prior to spring departure for the breeding grounds in Canada (Table 2). The size of outbreaks was often small, 70% of them involved less than 50 geese (Table 3).

Numbers of Pellets Ingested/Bird—Data from outbreaks (Wis. Dep. Nat. Resourc., unpubl. data) indicated geese were eating large numbers of pellets per bird with mean numbers of pellets per bird equal to 15.4 on Fox Lake (1966), 11.8 from Horicon Marsh (1963), and 8.4 on Rush Lake (1987). Pellets per goose were more variable at Horicon Marsh with an average of 1.4 and 11.8 pellets in 1962 and 1963, respectively. The range from known lead poisoning cases was 0 to 111 pellets per goose. Those with zero pellets were found to have ground pellets below the point of recognition.

Table 2. Month in which lead poisoning in Canada Geese occurred 1940–94.

Month	Number of outbreaks recorded
January	21
February	6
March	3
April	35
May	14
June	2
July	1
August	0
September	3
October	3
November	8
December	30
Total	123[a]

[a]Number of outbreaks in which the month of occurrence was recorded.

Table 3. Magnitude of lead poisoning outbreaks in Canada Geese in Wisconsin 1940–94.

Size of occurrence (individuals)	Number of outbreaks[a]
1–9	72
10–50	23
51–100	9
101–500	14
501–1000	3
>1000	1
Total	122[a]

[a]Number of outbreaks in which the number of individuals was recorded.

Lead Concentrations in Liver Tissues—Lead levels in liver tissues of greater than 8 ppm are diagnostic of lead poisoning (Friend 1985). Livers from dead geese at Horicon in 1963 (n=10) contained from 16–24 ppm

lead. At Rush Lake in 1987 (n=15) and Green Lake County in 1984 (n=10) levels averaged 20.8 and 7.5 ppm, respectively.

Most Recent Outbreaks and Follow-up—In January and February 1981, a massive lead poisoning outbreak occurred when over 3,000 geese died on Lake Puckaway and over 500 on the Grand River below the Grand River Marsh Wildlife Area dam (Table 1). Since the use of lead shot had been prohibited on this site since 1977 (except 1980), and the site had been heavily hunted historically, it was believed that this was a case of reoccurring availability of large past deposits. A sandy hard bottom beneath a 5 acre open hole remaining in the ice was sampled for shot and found to contain approximately 13,000 lead shot per acre (W. Wheeler, Wis. Dep. Nat. Resourc., unpubl. data).

Suspicions that geese were picking up lead from upland hunting sites after or during the hunting seasons led to sampling hunted fields surrounding Grand River Marsh Wildlife Area in April 1981. Samples of an alfalfa field with goose blinds had 81,400 pellets per acre (94% lead, 6% steel); samples of a newly planted corn field in a blind area revealed 30,400 pellets per acre (98% lead, 2% steel) (G. Eveland, B. Eichhorst Wis. Dep. Nat. Resourc., unpubl. data). Steel shot was required in 12 gauge only in 1978 and 1979 on these upland areas and lead was allowed statewide again in 1980 just prior to this sampling.

Following the 1981 winter die-off, the non-toxic shot zones for guns of all gauges were reinstated and changed to exclude lead shot anywhere in the heavily hunted Horicon and Central Goose Management Zones and within 150 yards of water in 18 surrounding counties, the Mississippi River, and the west shore of Green Bay. In 1984, Dane and Kenosha counties were added and in 1985 Juneau County was added. In 1987, non-toxic shot was made mandatory statewide.

In the years since statewide non-toxic shot rules were established, the number of areas having outbreaks has decreased considerably, yet some areas with known historic lead deposits continue to be a problem. Rush Lake continued to have die-offs in 1987–89. Relatively large numbers of geese (15,000–30,000) used the lake in early December 1987–89 after the hunting season, but before freeze-up occurred (Wis. Dep. Nat. Resourc., unpubl. data).

Most recently in 1992, a die-off occurred in January at Lake Geneva killing 134 geese. The source of lead in this case was the Southern Lakes Trap and Skeet Club which deposited lead into a spring-fed marshy area that remained ice-free in January. The mean number of pellets ingested (size 8–9) was 191 with one bird containing 901 pellets and 15 of 34 checked with over 150 pellets each (W. Wheeler, Wis. Dep. Nat. Resourc., unpubl. data). In May 1994, approximately 25 geese died in the vicinity of the Fall River Rod and Gun Club's trap range having consumed lead pellets in a lowland spring area (P. Kaiser, Wis. Nat. Resourc., pers. commun.).

Conclusion

The magnitude of lead poisoning has increased as the populations of

both migrant Canada Geese and summer-long resident giant Canada Geese have increased.

Most poisonings occur in December through April when the lack of hunting pressure allows geese to concentrate on lead deposits either in remaining open water areas in winter, seasonally flooded areas in spring, and heavily hunted upland feeding sites.

Most poisoning incidents (80%) are 1–50 individuals with large die-off much more rare. The small occurrences, which are most numerous, generally go unnoticed due to scavenging by predators and the difficulty of finding carcasses in marsh habitats.

Drawdowns of lakes and marshes and natural drought often expose historic deposits of lead to waterfowl. Sand and rock bars in lakes and flowages often contain shot deposits, even in some lakes that are thought to have mainly muck bottoms such as Lake Puckaway and Lake Maria.

Secondary poisoning of birds of prey such as eagles and hawks is also a concern. They often feed on waterfowl with both ingested shot and shot in tissues, as the result of hunting in areas still allowing lead shot, such as Canada. Larger waterfowl such as swans are even more susceptible to lead as they can reach deposits in deeper waters. Lead poisoning remains a major problem for the Trumpeter Swan reintroduction program in the Midwest.

Drawdowns of both public and private wetlands where histories of lead deposits are present need to be planned to avoid times of waterfowl concentration in spring and fall. Scare techniques need to be used on areas where drought makes deposits available to waterfowl. Careful planning of trap and skeet ranges needs to be pursued to avoid lead deposits in areas utilized by waterfowl and other birds.

Although the number of lead poisoned geese in Wisconsin will decrease with time, upland hunting, trap and skeet shooting, and historic deposits will continue to pose problems. The legacy of lead poisoning in Wisconsin will remain.

Acknowledgements

I would like to recognize the many Wisconsin Department of Natural Resource biologists and technicians who, over the years, kept records and examined lead poisoned geese. Without their work, this paper and the steps toward reducing lead poisoning would not have been possible. Larry Jahn, Dick Hunt, Jim Bell, Glen Eveland, Gary Jolin, Tom Hansen, Dave Evenson, Tom Becker, Jim March, Carl Batha, Tom Nigus, Maureen Rowe, Terry Amundson, and Sarah Hurley were instrumental in dealing with the outbreaks and providing records. I would like to thank Gary Jolin, Mike Meyer, LeRoy Petersen, Jon Bergquist, and Glen Eveland for their review of this manuscript.

Partial funding for this study was provided by the Federal Aid to Wildlife Restoration, Pittman-Robertson Proj. W-141-R.

Literature Cited

Adler, F. E. W. 1944. Chemical analyses of organs from lead-poisoned Canada geese. *Journal of Wildlife Management* 8(1):83–85.

Bellrose, F. C. 1959. Lead poisoning as a mor-

tality factor in waterfowl populations. *Illinois Natural History Survey Bulletin* 27(3):235–288.

Cook, R. S. and D. O. Trainer. 1966. Experimental lead poisoning of Canada geese. *Journal of Wildlife Management* 30(1):1–8.

Craven, S. R. 1975. History and ecology of the Canada geese wintering near Rock Prairie, Wisconsin. M.S. Thesis, University of Wisconsin-Madison. 72 pp.

Friend, M. 1985. Interpretation of criteria commonly used to determine lead poisoning problem areas. United States Department of the Interior, U.S. Fish and Wildlife Service, Fish and Wildlife Leaflet 2, Washington D.C. 5 pp.

Hartmeister, F. A. and M. J. Hansen. 1950. Lead shot and waterfowl poisoning.

Hartsough, G. R. 1944. Lead poisoning. *Wisconsin Conservation Department Bulletin* 9(6):27.

Jahn, L. R. 1949. Lead poisoning in Canada geese. *Wisconsin Wildlife Research Quarterly Report* 10:27–29.

Schillinger, J. E. and C. C. Cottam. 1937. The importance of lead poisoning in waterfowl. *Transactions of the Second North American Wildlife Conference* 2:398–403.

Strohmeyer, D. L. 1982. Evaluation of ingested shot levels in waterfowl harvested in Wisconsin in 1980. *Transactions of the Wisconsin Academy of Sciences, Arts and Letters* 80:36–41.

Trainer, D. O. and R. A. Hunt. 1965. Lead poisoning of waterfowl in Wisconsin. *Journal of Wildlife Management* 29(1):95–103.

Wheeler, W. E. and J. M. Cole. 1990. The history and status of Wisconsin's resident Canada goose population. *Wisconsin Department of Natural Resources Research-Management Findings* 26. 4 pp.

William E. Wheeler
Wisconsin Department of Natural Resources
1210 N. Palmatory Street
Horicon, WI 53032

Corrigendum

The drawing of the Green Heron by William R. Stott, Jr., on page 22 of Vol. 57, No. 1, Spring 1995, was incorrectly identified as a Black-crowned Night-Heron. The editors regret the error.

The Winter Season: 1994–95

by Kenneth I. Lange

It was a strange winter, with little snow and generally mild conditions. As the Smiths in Oconto County expressed it, it was the "winter that wasn't." 1994 in fact was the third warmest year on record; 1990 and 1991 were the warmest.

Another El Niño developed in the fall of 1994, and peaked in December and January. Also contributing to the mild conditions was a polar jet stream which was displaced well north of its normal location; cold Arctic air did not reach as far south as it usually does in winter (*Science News* 11 March 1995).

Here is a sampling of weather comments from contributors: "We did have below zero readings but not as early (December was *warm*) and for shorter periods than in the average winter" (Robbye Johnson, Douglas County); "Temps. above average; snow well below average" (Jim Baughman, Vilas County); "There was little snow cover, lots of open water" (Joe Hudick, Polk County); and "Generally milder and less snow," with "warm and cold spells" in January and February (Barbara Duerksen, Richland County).

The period began with a snow cover of 1–10 inches, north of a line from LaCrosse to Green Bay, and above normal temperatures. Several snowstorms moved through Wisconsin in December; the first in southern Wisconsin was on the 6th. Temperatures in December were variable, but mainly above normal.

The first bitter cold of the period occurred in the first week of January. Temperatures were then variable, with snow or, in southern Wisconsin, rain for the remainder of the month.

February was the coldest month, with a cold snap in the first and second weeks and another at the end of the month. Snow depths at the end of February were variable, but generally minimal.

Unusual weather should produce unusual records. It did. Common Loon and Common Merganser lingered on Vilas County lakes through 6 December, while diving ducks concentrated in larger numbers and later than usual on Lake Michigan. White-winged Scoter sometimes

overwinters in Wisconsin, but it is rare for Black Scoters and Surf Scoters to remain past December; this winter all 3 species were noted well into 1995. The scoters were seen in a number of places, but especially Ozaukee County, where high counts of Common Goldeneye and Greater Scaup were also reported. Veteran observers, such as Daryl Tessen, had never seen such concentrations of divers, especially scoters.

Puddle ducks also overwintered in greater numbers and variety than usual.

The period also produced a high count of 4 species of grebes, including Wisconsin's first winter records of Western Grebe since the 1975–76 winter.

Gulls were represented by a total of 10 species, including lingering Franklin's Gulls and Bonaparte's Gulls.

Northern Harrier was noted after the Christmas Bird Counts in a total of 21 counties, 2–3 times the usual number, while Short-eared Owl was found in 10 counties, including a roost of approximately 100 birds in Door County.

Perhaps even more remarkable was the group of approximately 25 Turkey Vultures that overwintered in Sauk County; the birds roosted in a 75 year old white pine plantation in Devil's Lake State Park. This species has been recorded previously in winter on some dozen occasions, but only 1–2 birds each time (Robbins, S.D., Jr., 1991, *Wisconsin Birdlife,* page 200; Kenneth I. Lange records).

The mild and open winter must also have been a factor in the Northern House Wren being found in Waukesha County, the Golden-crowned Kinglet being reported for a total of 12 counties, north to LaCrosse, Portage, Oconto, and Manitowoc Counties, and in the presence of all 3 species of mimic thrushes (Gray Catbird, Northern Mockingbird, Brown Thrasher) after the Christmas Counts. Solitary catbirds were reported from Bayfield and Door Counties, a mockingbird from Dane County, and thrashers from Shawano, Brown, and Door Counties. The following sparrows were reported after the Counts: Fox Sparrow, Song Sparrow, Lincoln's Sparrow, Swamp Sparrow, White-throated Sparrow, White-crowned Sparrow, and Harris' Sparrow; some of these records doubtless are weather related.

Winter finches were a mixed bag. American Goldfinch was numerous statewide, but Pine Grosbeak, Red Crossbill, White-winged Crossbill, Common Redpoll, Pine Siskin, and Evening Grosbeak were virtually confined to the northern half of the state.

Some final comments on a potpourri of species. The House Finch is now found virtually throughout the state; anyone interested in tracking its spread while the records are still fresh? Cedar Waxwing was generally scarce, although in above normal numbers in Polk County. Northern Shrike was in normal to above normal numbers in some places, for example Douglas, Polk, and Washington and Ozaukee Counties, but otherwise in relatively low numbers. Northern Goshawk numbers were about average for the years following the 10- year cycle peak in 1992 (Molly Evans, *Hawk Ridge*

Annual Report, April 1995), while Rough-legged Hawk numbers were generally normal or above normal. The Snowy Owl was in low numbers. At least 14 Bald Eagles died over the winter in Sauk and Columbia Counties from an unknown toxin or toxins, and another 5 were found alive but suffering from convulsions and vomiting; the poison(s) could not be identified (*Wisconsin State Journal* 14 April 1995).

Late fall migration was reported for Tundra Swan and Canada Goose. Spring migration was reported for the following species: Great Blue Heron, Mute Swan, Canada Goose, Snow Goose (?), Northern Pintail (?), Blue-winged Teal (?), Lesser Scaup, Common Goldeneye (?), Hooded Merganser, Common Merganser (?), Ruddy Duck (?), Turkey Vulture, Bald Eagle, Northern Harrier, Sharp-shinned Hawk (?), Cooper's Hawk (?), Rough-legged Hawk, American Kestrel, American Coot (?), Sandhill Crane, Killdeer (?), Herring Gull (?), Eastern Bluebird, American Robin (?), Song Sparrow (?), Red-winged Blackbird, Eastern Meadowlark (?), Common Grackle (?), and Brown-headed Cowbird (?). See the species accounts for details.

In addition to migrants, there were these signs of spring: the Northern Cardinal was singing in Oconto County on 13 February (Smiths), and the Greater Prairie-Chicken was booming in Portage County on 18 February (Tessen).

A total of 79 people contributed reports covering 56 counties. The counties with the most extensive coverage (8–12 contributors) were Dane, Ozaukee, and Milwaukee, whereas 18 counties were covered by only one report. The following 16 counties, scattered throughout the state, were not covered: Buffalo, Burnett, Chippewa, Clark, Eau Claire, Florence, Grant, Green, Iron, Lincoln, Marinette, Marquette, Pepin, Racine, Rock, and St. Croix.

The following common statewide species are not included in the species accounts: Great Horned Owl, Barred Owl, Downy Woodpecker, Hairy Woodpecker, Pileated Woodpecker, Blue Jay, American Crow, and Black-capped Chickadee.

These abbreviations are included with the species accounts: BOP–beginning of period, EOP—end of period, TTP—throughout the period, m. obs.–many observers, and CBC—Christmas Bird Count(s).

Reports (1 December 1994–28 February 1995)

Common Loon.—Lingering on Vilas County lakes thru 6 December (Drings). One in Washington County thru 24 December (Haseleu), and one in Dane County thru 26 December (Evanson).

Pied-billed Grebe.—One TTP by an inlet of Lake Minocqua, Oneida County, where 2 birds overwintered last winter (Bowman). One thru 21 January in Winnebago County (Ziebell).

Horned Grebe.—No records after the CBC.

Red-necked Grebe.—One in Dane County, BOP-9 December (m. obs.), and one in Lake Winnebago, Fond du Lac County, approximately 5 December–6 February (m. obs.), when it was found dead on shore ice. The latter bird survived until the cold spell of early February, when the patch of open water it had been frequenting by the mouth of the Fond du Lac River became quite small (Schultz).

Western Grebe.—One in Milwaukee County, 2–6 December (m. obs.; documented by Domagalski, who found it, and Diehl and Wood), and one in Dane County, 6–17 December (m. obs.; discovered by Burcar). First winter records since 24 January 1976.

Double-crested Cormorant.—At least 3 TTP in Winnebago County (m. obs.).

Great Blue Heron.—One in Dane County thru 16 January (Ashman). A migrant in Kenosha County, 19 February (Bishop)

Tundra Swan.—Fall migration mainly on 17–18 December (m. obs.), with 50+ leaving Rock Lake, Jefferson County, at 7:27 A.M. on the 18th and heading southeast (Hale). The Smiths noted 73 in Oconto County on 27 December. Latest date: 3 January, Dane County.

Trumpeter Swan.—Two on the Poynette CBC and one on the Beloit CBC.

Mute Swan.—After the CBC, noted in these counties: Douglas, Bayfield, Ashland, Portage, Shawano, Door, Dane, and Washington (m. obs.). In Washington County, Domagalski saw the last fall bird on January 8th and the first spring bird on February 28th.

Snow Goose.—After the CBC, one TTP in Winnebago County (m. obs.), and 6 (migrants?) in Walworth County, 27 February (Parsons).

Canada Goose.—In northern Wisconsin thru 22 December in Douglas County and 2 January in Oconto County. TTP in Polk, LaCrosse, Monroe, Portage, Outagamie, and Winnebago Counties, along Lake Michigan from Door to Kenosha Counties, and in Washington and Walworth Counties (m. obs.). Frank estimated 1000 in Ozaukee County on 6 January. In Jefferson County 100+ were flying south on 8 January, while in February 10 were flying north on the 20th and over a thousand on the 25th (Hale).

Wood Duck.—After the CBC, 1–2 birds TTP in these counties: LaCrosse, Waupaca, Winnebago, Brown, Manitowoc, Ozaukee, and Dane (m. obs.).

Green-winged Teal.—After the CBC, one in Waupaca County, 12 January (Peterson), and one in Manitowoc County, 12 February (Sontag).

American Black Duck.—Reported from 21 counties scattered thruout the state (m. obs.).

Mallard.—Reported from 28 counties scattered thruout the state (m. obs.).

Northern Pintail.—After the CBC, 1–2 birds in Dane, Portage, Outagamie, Brown, and Ozaukee Counties (m. obs.). Three in Marathon County, 17 February (Belter)—migrants? Uttech reported this species in Ozaukee County, EOP.

Blue-winged Teal.—Two females in Vernon County, 26 February (Dankert)--migrants?

Northern Shoveler.—Approximately 250 TTP in Dane County; usually 50–100 overwinter (Hilsenhoff). After the CBC, also these records: Fond du Lac County, 25 January–9 February (m. obs.), Winnebago County, TTP (Tessen), Brown County, 22 February, a male (Nussbaum), and Manitowoc County, thru 28 January, 1 (Sontag).

Gadwall.—TTP in Outagamie, Winnebago, Dane (approximately 40, a low number), Milwaukee, Ozaukee, and Sheboygan Counties (m. obs.).

American Wigeon.—TTP in Portage, Outagamie, Winnebago, Sheboygan, Milwaukee, and Dane Counties. Maximum 10 in Dane County (Hilsenhoff), otherwise single birds (m. obs.).

Canvasback.—After the CBC, these records: Dane County, thru 3 January, maximum 7, 24 December (Ashman; Burcar), Winnebago County, thru 22 January (Ziebell), Manitowoc County, 28 January–8 February, 2 (m. obs.), Ozaukee County, TTP, 1–3 (m. obs.), Milwaukee County, TTP, maximum 13, 19 February (m. obs.), and Kenosha County, 21 February (Hoffmann).

Redhead.—After the CBC, these records: Dane County, 3 January (Burcar), Winnebago

County, 6 January (Nussbaum), Brown County, 28–31 January, 2 males (Nussbaum), Manitowoc County, 8 February, 1 (Tessen), Sheboygan County, 8 January, 15 (S. Baughman), Ozaukee County, 18–21 January, 22 (Diehl; Domagalski), and Milwaukee County, TTP, maximum 40 (m. obs.).

Ring-necked Duck.—After the CBC, these records: a male on the Plover River at Whiting Park in Stevens Point, Portage County, for the 5th consecutive winter (Berner), 1–2 TTP in Waupaca County (Tessen), 3 males, 28–31 January, Brown County (Nussbaum), at least 4 TTP in Winnebago County (Nussbaum), and Sheboygan County, 2 January (Frank).

Greater Scaup.—TTP in Lake Michigan between Door and Kenosha Counties, TTP in Winnebago County (a total of 4), and 3 January, Dane County (m. obs.).

Lesser Scaup.—TTP in LaCrosse County, also Fond du Lac, Winnebago, Outagamie, and Brown Counties, and Milwaukee, Ozaukee, and Sheboygan Counties (m. obs.). Migrants (a total of 9) in Dane County, 25 February (Ashman); migrants (?) in Ozaukee County, 26 February (Uttech).

Eider species.—While watching waterfowl from Harrington Beach State Park, Ozaukee County, on 3 December, Tessen noted a larger bird among the scaup and scoters. It was obviously an eider, "a large brown/tan duck with sloping head, large bill, brown sides," but because of the distance a species identification could not be made.

Harlequin Duck.—A male and a female in Milwaukee County, 16–25 January (m. obs.), 4 males and a female in Sheboygan County, 3 December–17 February (m. obs.; documented by the Brassers), and one in Dane County, 8–9 December (Burcar).

Oldsquaw.—TTP in Lake Michigan between Door and Kenosha Counties (m. obs.); one on Lake Wingra, Dane County, 4–5 December, and 1–2 on Lake Monona, Dane County, 16 December–1 January (m. obs.); and four in LaCrosse County, 6 December (Lesher).

Black Scoter.—Rare in Wisconsin in winter, at least in recent times. In Ozaukee County, Tessen noted a total of 25 on 3 December, and Domagalski saw a total of 12 on 1 January, and a male and a female were still there on 21 January.

Surf Scoter.—Until this reporting period, there were no winter records for this species after 30 December, other than 2–3 in Milwaukee County on 27–28 February 1993; in Ozaukee County on 1 January, Domagalski found a total of 40, and on 16 January Tessen found a total of 25. Tessen had tallied a total of 105 in Ozaukee County on 3 December. Still there on 13 February (Uttech). Also one in Dane County, 11 December (Morris).

White-winged Scoter.—Lake Michigan between Door and Milwaukee Counties (m. obs.): TTP, at least 3, in Door County (Lukes), and probably TTP in the other counties also. Domagalski found this species in Washington County, 14–27 December.

Common Goldeneye.—TTP in Lake Michigan between Door and Kenosha Counties, the Fox River watershed, Walworth County (?), the Wisconsin River north to Portage County, and the Mississippi River and the St. Croix River north to Polk County (m. obs.). In Ashland and Bayfield Counties thru 21 January (Verch). A total of 12 in Douglas County on 28 February, a female in Barron County on 25 February, and 8 in Marathon County on 17 February: migrants (?).

Barrow's Goldeneye.—A male in Lake Michigan off Virmond Park, Ozaukee County, 9 December–26 January; first reported by Uttech. Also documented by Bontly, Wood, Frank, Domagalski, Bruce, and Tessen. First winter record since the Newburg (Ozaukee County) 1990 CBC.

Bufflehead.—TTP in Lake Michigan between Door and Kenosha Counties (m. obs.), 3 January in Walworth County (Parsons), TTP in Dane County (m. obs.), thru 9 February in Fond du Lac County (Tessen), and one thru 15 January in Winnebago County (Ziebell).

Hooded Merganser.—TTP in Winnebago and (2–4 birds) Outagamie Counties (Tessen), one probably TTP in Portage County (Berner), and a female in Dane County, 16 January (Ashman). Migrants or possible migrants in LaCrosse County, 26–27

February (4 birds; Dankert), Marathon County, 27 February (Ott), Dane County, 25 February (a male; Ashman), and Washington County, 25 February (Domagalski).

Common Merganser.—Noted on Vilas County lakes thru 5 December (J. Baughman). One in Douglas County on 21 January (Johnson, Robbins). TTP in the following localities: Lake Michigan between Door and Kenosha Counties, Washington County, Winnebago, Outagamie, and Waupaca Counties, and (?) Vernon County (m. obs.). Migrants (?) in Marathon County, 17 February (6 birds; Belter), and LaCrosse County, 26 February (Dankert).

Red-breasted Merganser.—TTP in Lake Michigan between Door and Kenosha Counties (m. obs.); also in Dane County, 3 January (Burcar), and Winnebago County thru 22 January (Ziebell).

Ruddy Duck.—Uttech found this species in Ozaukee County, 1 January, and Ziebell noted it in Winnebago County thru 15 January. Possible migrants in Winnebago County, 28 February (a pair; Nussbaum), and LaCrosse County, 25 February (one; Dankert).

Turkey Vulture.—Approximately 25 TTP in Sauk County, generally roosting in a white pine plantation in Devil's Lake State Park (Lange and Mossman); previously known in winter in Wisconsin on some dozen occasions, but only 1–2 birds each time. Reported on the Blanchardville (Lafayette County) and Shawano CBC. Parsons found one in Walworth County on 23 February, and Domagalski saw this species in Washington County on 28 February.

Bald Eagle.—TTP in approximately 20 counties, including Douglas, Bayfield, Ashland, Vilas, Oconto, and Door Counties (m. obs.). Bowman reported at least 6 TTP in Oneida County.

Northern Harrier.—After the CBC, records for 21 counties. Northernmost limits for overwintering birds: Monroe, Portage (?), Outagamie, and Door Counties. Spring migration most pronounced from 16–21 February (m. obs.).

Sharp-shinned Hawk.—After the CBC, reported from 15 counties, north to Bayfield, Ashland, Portage, and Door Counties. Migrants (?) in Dane County, 15 and 22 February (m. obs.).

Cooper's Hawk.—After the CBC, records for 17 counties, north to Monroe, Marathon, Outagamie, and Door Counties; some February records could be migrants (m. obs.).

Northern Goshawk.—TTP in Bayfield, Ashland, and Door Counties, 2 January in Marathon County, 8 January in Monroe County, 2 thru 26 February in Dane County, and 14 January in Winnebago County (m. obs.).

Red-shouldered Hawk.—One in Polk County, probably TTP (Hudick), Dunn County, TTP (Raile), and Adams County, one on 18 February (Tessen).

Red-tailed Hawk.—Northward to these counties, where TTP: Douglas, Bayfield, Ashland, Marathon, Oconto, and Door (m. obs.).

Rough-legged Hawk.—Generally above normal numbers. High counts from 5–8 February and 27 February; several major flights thru Wisconsin in late winter?

Golden Eagle.—Exclusive of the CBC, these records: an immature in Jackson County, 18 February (Tessen), maximum 3 in Monroe County, 17 December–25 February (Epstein), an adult in Juneau County, 18 February (Tessen), and an immature in Sauk County, 18–19 February (Hale).

American Kestrel.—Northward and at least into February in the following counties: Polk, TTP; Marathon, thru 13 February; Langlade, 8 February; Oconto, TTP; and Door, TTP. Migrants by at least EOP, for example 5 in Sheboygan County, 27 February (m. obs.).

Merlin.—After December, these records: Bayfield and Ashland Counties, TTP (Verch), and Brown County, 31 January (Nussbaum) and 25 February (Tessen).

Gray Partridge.—Barron, Dodge, Outagamie, and Door Counties (m. obs.).

Ring-necked Pheasant.—Northward to Polk, Taylor, Marathon, Oconto, and Door Counties (m. obs.).

Spruce Grouse.—Ashland County (m. obs.), Vilas County (Phelps CBC), and Langlade County (Tessen).

Ruffed Grouse.—I am not familiar with Ruffed Grouse numbers in other areas in Wisconsin, but in Sauk County, for example Devil's Lake State Park, this species crashed in 1991 and is only now beginning to increase. The population had been relatively stable since at least 1966.

Greater Prairie-Chicken.—Marathon County (Belter), Wood County (Arpin CBC), and Portage County (Peterson; Tessen).

Sharp-tailed Grouse.—The only record: 16 on the Gilman CBC (Taylor County), 24 December.

Wild Turkey.—Reported from 23 counties, north to Pierce, Portage, Shawano, Oconto, and Door Counties (m. obs.).

Northern Bobwhite.—After the CBC, reported only from Richland County, where TTP, maximum 10, 21 December (Duerksen).

King Rail.—One on the Poynette CBC, Columbia County, 31 December.

Virginia Rail.—One at Lake Wingra, Dane County, 11 and 17 December (Ashman).

American Coot.—1–2 TTP in Brown, Winnebago, and Fond du Lac Counties; TTP in Ozaukee County; TTP, maximum 60 on 17 January, in Milwaukee County; TTP in Walworth County; and a few TTP in Dane County. January records for Manitowoc, Sheboygan, and Kenosha Counties. Two (migrants?) in Vernon County, 26 February (m. obs.).

Sandhill Crane.—Single birds on a Dane County CBC, in Waushara County, 26–30 December (Nussbaum), and (probably sick or injured) on the Pensaukee (Oconto County) CBC. Strelka heard this species calling at dusk on 18 February in Vernon Marsh, Waukesha County, and Hale received reports of 3 in Dane County, 25 February, and one in Jefferson County, 26 February.

Killdeer.—Vernon County, 2 on 18 February and 5 on 26 February at the same locality (Dankert). One (migrant?) in Milwaukee County, 22 February (via Diehl).

Purple Sandpiper.—One at North Point in Sheboygan, Sheboygan County, 13 December (documented by Domagalski).

Common Snipe.—Peterson found 2 in Shawano County, 8 January and 9 February.

Franklin's Gull.—This species is rarely found in Wisconsin after November. Dankert documented one in Vernon County at the Genoa Fish Hatchery, 3 December, for the state's 4th winter record.

Bonaparte's Gull.—Hoffmann reported 2 in Kenosha County, 19 January.

Mew Gull.—At least 2 in Port Washington, Ozaukee County, 12–13 December and 18–22 February (documented by Uttech and Thiessen).

Ring-billed Gull.—TTP in Lake Michigan, north to Sheboygan County, thru 22 January in Manitowoc County, TTP in Winnebago County, TTP in Washington County, thru 20 January in Walworth County, thru 3 January in Dane County, thru 10 December in LaCrosse County, and thru 4 December in Douglas, Bayfield, and Ashland Counties (m. obs.).

Herring Gull.—TTP in Lake Michigan, north to Door County, thru 17 January in Walworth County, TTP in Washington County with 6000+ at a landfill along the Washington-Waukesha county line on 25 February, 25 February (migration?) in Waupaca County, TTP in Winnebago and Outagamie Counties, thru 28 January in Brown County, thru 3 January in Dane County, and TTP in Douglas, Bayfield, and Ashland Counties (m. obs.).

Thayer's Gull.—Excluding the CBC, these records: Port Washington, Ozaukee County, TTP, at least 2 (m. obs.; documented by Uttech), Sheboygan County, 3 December–27 February, 3 (m. obs.), Manitowoc County,

29 December–13 February, maximum 2 (Tessen), and Superior, Douglas County, an adult on 6 January (documented by Dankert and Lesher).

Iceland Gull.—Excluding the CBC, these records: Superior, Douglas County, one on 6 January (documented by Dankert and Lesher), Two Rivers, Manitowoc County, 29 December–20 February, at least 2 (m. obs.; documented by Domagalski and Peterson), Harrington Beach State Park, Ozaukee County, a second-year bird on 30 January (Robbins), Port Washington, Ozaukee County, one on 14 February (documented by Uttech), and Milwaukee, Milwaukee County, one on 5 February (Wood).

Lesser Black-backed Gull.—One in Dane County thru 9 December, probably the same bird first noted on 27 September (documented by Burcar).

Glaucous Gull.—Excluding the CBC, these records: Milwaukee County, 16 January and 19 February (Tessen; Domagalski), Ozaukee County, 20 December–EOP (m. obs.), Sheboygan County, 30 January–17 February, 1 (S. Baughman), Manitowoc County, 13 January–13 February (m. obs.), Winnebago County, 12 and 20–21 December, 1 (Tessen; Ziebell), and Douglas County, 6–20 January, maximum 10 (m. obs.).

Great Black-backed Gull.—Excluding the CBC, these records: Kewaunee County, an adult on 18 February (Tessen), Manitowoc and Two Rivers, Manitowoc County, 29 December–EOP, maximum 6, mostly adults (m. obs.), Sheboygan County, 3 December, 1 (Tessen), Port Washington, Ozaukee County, 5 and 30 January (documented by Uttech), and Milwaukee, Milwaukee County, 18 February, 2 (documented by Domagalski).

Rock Dove.—Northward to the following counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door (m. obs.).

Mourning Dove.—Northward to the following counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door (m. obs.).

Eastern Screech-Owl.—After the CBC, reported from Ozaukee, Sheboygan, Winnebago, Dodge, and Dane Counties (m. obs.).

Snowy Owl.—After the CBC, reported from 10 counties, south to Dane, Milwaukee, and Kenosha Counties (m. obs.).

Long-eared Owl.—Wood noted at least 8 in Vernon Marsh, Waukesha County, 10 December. After the CBC, these records: Washington County, 25 February–EOP (Domagalski), Winnebago County, 5–6 in a thicket, 21 February (Nussbaum), and Manitowoc County, 22 January–25 February, maximum 3, 22 January (m. obs.).

Short-eared Owl.—Reports for 10 southern and eastern counties: Iowa, Dane, Milwaukee, Ozaukee, Washington, Dodge, Green Lake, Calumet, Manitowoc, and Door. Up to approximately 100 (!) roosted in a "Christmas tree plantation" near Brussels in Door County (m. obs.); reduced numbers in February, presumably because of a declining food supply (Tessen).

Northern Saw-whet Owl.—The Smiths noted one in Oconto County, 3–4 December, and Uttech found one in Ozaukee County, 2 December. After the CBC, these records: Barron County, 24 February (Faanes), and Price County, 20 January, heard in the daytime (Robbins).

Belted Kingfisher.—After the CBC, records for 10 counties: Pierce, LaCrosse, Vernon, Monroe, Portage, Dane, Iowa, Waupaca, Manitowoc, and Lafayette (m. obs.).

Red-headed Woodpecker.—After the CBC, records for 11 counties: LaCrosse, Jackson, Monroe, Juneau, Portage, Sauk, Iowa, Dane, Lafayette, Walworth, and Winnebago (m. obs.).

Red-bellied Woodpecker.—Northward to Polk, Barron, Rusk, Marathon, and Door Counties (m. obs.).

Yellow-bellied Sapsucker.—After the CBC, these records: Calumet County, a male at a feeder, 9 January (Koopman), Dane County, 3 January (Robbins), and Milwaukee County, 6 February (Zehner).

Black-backed Woodpecker.—Vilas and Oneida Counties (m. obs.).

Northern Flicker.—After the CBC, records for 7 counties: Iowa, Dane, Lafayette, Washington, Ozaukee, Manitowoc, and Oconto (m. obs.).

Horned Lark.—TTP in Monroe, Outagamie, Winnebago, Ozaukee, Washington, Dodge, Dane, Iowa, and Lafayette Counties, also Barron County. Migration from 27 January into February, with records for northern Wisconsin, for example Vilas County, by EOP (m. obs.).

Gray Jay.—Excluding the CBC, records for Douglas, Ashland, Price, Vilas, Oneida, and Forest Counties (m. obs.).

Common Raven.—Southernmost records: Monroe County, TTP (Kuecherer), Sauk County, Wisconsin Dells area, 19 January, 1 (Robbins), and Outagamie County, thru 12 February (Anderson and Petznick).

Boreal Chickadee.—Excluding the CBC, records for Vilas, Oneida, Forest, and Langlade Counties (m. obs.).

Tufted Titmouse.—Excluding the CBC, records for Sauk County, 1 January, and Iowa and Dane Counties, TTP (m. obs.).

Red-breasted Nuthatch.—TTP thru much of the state, including far northern counties (m. obs.).

White-breasted Nuthatch.—Northward to the following counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door Counties (m. obs.).

Brown Creeper.—After the CBC, northernmost records for Price County, TTP (Hardy), Vilas County, 24 January (J. Baughman), Oconto County, probably TTP (Smiths), and Door County, TTP (Lukes). Nussbaum called this species "numerous" in Winnebago County.

Carolina Wren.—One on the Appleton CBC (Outagamie County) lingered for the remainder of the period (m. obs.). Kramer reported one in Marathon City, Marathon County, details unknown.

House Wren.—One in Waukesha County on a CBC, 17 December (Kailing), only the 3rd record for Wisconsin after mid–November. Also known from December 1939 in Racine County and December 1991 in Dane County.

Winter Wren.—No records after the CBC.

Marsh Wren.—One at Lake Wingra, Dane County, thru 1 January (Ashman).

Golden-crowned Kinglet.—After the CBC, reported from a total of 12 counties, north to LaCrosse, Portage, Oconto, and Manitowoc Counties (m. obs.).

Ruby-crowned Kinglet.—Two on the Sauk City CBC, 26 December.

Eastern Bluebird.—After the CBC, the Smiths found one in Oconto County on 18 January, Ashman reported 1–2 in Dane County on 21 January and Domagalski noted migration in Washington County, 24 February.

Townsend's Solitaire.—At least 3 on the west bluff, Devil's Lake State Park, Sauk County, 12 November–18 February (Burcar, Domagalski, Lange, Peterson, Smiths, Wood, Tessen).

Hermit Thrush.—After the CBC, these records: one in Dane County at least thru 18 February (Hansen), and one in Ozaukee County, 26 January (Tessen).

American Robin.—TTP in at least 8 counties scattered thruout the state, including Douglas County (at least 1 in Superior), and Bayfield and Ashland Counties (m. obs.). Noted on 19 February in Vilas County (J. Baughman). Mid and late February reports for Walworth, Lafayette, Sauk, Monroe, and Dodge Counties might have included migrants (m. obs.). Maximum numbers were 48 in Sheboygan County, 31 January (S. Baughman), and 40 in Milwaukee County, 11 January (Bontly).

Varied Thrush.—Excluding the CBC, a total of 8 reports, mostly adult males, from the following counties: Sawyer, Rusk, Price, Taylor, Marathon, Langlade, Shawano, and Winnebago. All were at feeders, in some cases for just a short time but mainly for at least several weeks. The records covered the entire period (m. obs.).

Gray Catbird.—One at a feeder in Bayfield County thru 11 February, the first January–February record for the Ashland/Bayfield area (Verch). Also one in Door County, 19 February (Lukes).

Northern Mockingbird.—One on the Madison CBC, 17 December, was still present on 16 January, when it was seen eating buckthorn berries (Ashman).

Brown Thrasher.—After the CBC, these records: one in Shawano County, 8 January (Peterson), one in Brown County, 28 January–22 February (Nussbaum), and 1–2 TTP at a feeder in Door County (Lukes).

Water Pipit.—One on the Madison CBC, 17 December.

Bohemian Waxwing.—Excluding the CBC, these records: Vilas County, 6 December (J. Baughman), Marathon County, 18 February, 1 (Tessen), and Door County, 21–23 February, 45 (Lukes).

Cedar Waxwing.—After the CBC, absent from far northern counties, except for Oneida County where Bowman found it TTP. Scattered thru central and southern Wisconsin, with high numbers of 20–60 after the CBC. Migrants in southern Wisconsin by approximately mid–February (m. obs.).

Northern Shrike.—After the CBC, reported from 24 counties scattered thruout the state. High numbers in Polk County and Washington and Ozaukee Counties (m. obs.).

European Starling.—Northward to these counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door (m. obs.).

Yellow-rumped Warbler.—Exclusive of the CBC, just one record, a group of 6 in Menasha, Winnebago County, 24 December (Nussbaum).

Northern Cardinal.—Northward to these counties: Bayfield and Ashland, TTP (Verch), Vilas, a female in Eagle River thru at least 18 February (J. Baughman), Oconto, TTP (Smiths), and Door, TTP (Lukes).

Rose-breasted Grosbeak.—One on the Kenosha CBC, 17 December.

Rufous-sided Towhee.—One TTP in Langlade County (Pickerings).

American Tree Sparrow.—Northward to Washburn, Taylor, Marathon, Langlade, Oconto, and Door Counties (m. obs.).

Chipping Sparrow.—No records for this winter, but the Fond du Lac County Field Sparrow reported for last winter is herein corrected to Chipping Sparrow (Betty Flesch).

Clay-colored Sparrow.—One at a feeder in Brown County, 23–27 December (documented by Knickelbine).

Vesper Sparrow.—One on the Blanchardville CBC, Lafayette County, 18 December.

Fox Sparrow.—After the CBC, this report: one in Door County, 28 December-19 February (Lukes).

Song Sparrow.—TTP in Washington, Dane, and Portage Counties; January records for Jefferson and Ozaukee Counties; and February records for Kenosha, Dodge, and Calumet Counties (m. obs.). Some of the February birds might have been migrants.

Lincoln Sparrow.—One at a feeder in Kenosha County, 2 January (Sedloff); only 8 previous winter records (Robbins, S.D., Jr., 1991, *Wisconsin Birdlife*, page 561).

Swamp Sparrow.—After the CBC, 1–2 TTP in the University of Wisconsin Arboretum, Dane County (Ashman), and one in Iowa County, 15 January (Burcar).

White-throated Sparrow.—TTP in the following counties: Milwaukee, at least 8; Dane, University of Wisconsin Arboretum, 3–5; Richland, 1, occasionally visiting a feeder; LaCrosse, 1; Marathon, 1 at a feeder and Outagamie, 1 at a feeder (m. obs.). Hale saw one eating "berries" in Jefferson County, 1 January.

White-crowned Sparrow.—After the CBC, these records: one at a feeder in Kenosha County, 2–21 February (Sedloff), one in Ozaukee County, 20 January–26 February (Frank), and one in Waupaca County, 10–18 February (Peterson; Tessen).

Harris' Sparrow.—Late December–EOP, one at a feeder in Outagamie County (m. obs.), and 2–21 January, one at a feeder in Kenosha County (Sedloff).

Dark-eyed Junco.—Northward to Bayfield/Ashland Counties, thru 19 December; Vilas County, 1 December; Forest County, 24 January; Oconto County, TTP; and Door County, TTP (m. obs.).

Lapland Longspur.—After the CBC, records for these counties: Dunn, Jackson, Dane, Columbia, Dodge, Washington, Ozaukee, Calumet, and Winnebago. Still in Dunn, Columbia, Dodge, and Ozaukee Counties EOP. Large flocks (75–200) in Winnebago, Dodge, and Washington Counties (m. obs.).

Snow Bunting.—After the CBC, records for 17 counties scattered thruout the state, except for the extreme northwest. Large flocks (45–150) in Vernon, Monroe, Oconto, and Door Counties (m. obs.).

Red-winged Blackbird.—TTP in Door County (Burcar). Single birds in Marathon County, 18 January (Belter), and Brown County, 28 January (Nussbaum). Migration by 27–28 February (21 February?) in southern Wisconsin, notably Dodge County where Tessen noted a total of 400 on the 27th.

Eastern Meadowlark.—Burcar found this species in Dane County on 11 January, and noted possible migrants in Dane and Columbia Counties EOP.

Meadowlark species.—25 January, one in Pierce County (Carlsen), and 26 January, one in Jefferson County (Hale).

Yellow-headed Blackbird.—One on the Fond du Lac CBC, 18 December.

Rusty Blackbird.—After the CBC, these records: 2 in LaCrosse County, probably TTP (Dankert), and one in Winnebago County, 20 January (Tessen).

Brewer's Blackbird.—TTP in Dodge County (Domagalski), maximum 50, 26 January (Tessen).

Common Grackle.—TTP in Dodge County (Burcar), one in Marathon County, 20 January (Belter), a male TTP (Drings) and a pair 15 February–EOP (J. Baughman) in Vilas County, and one in Oconto County, 12 February (Smiths). Migration (?) on 21 February in Kenosha County (4 birds; Hoffmann), and 28 February in Walworth County (1 bird; Parsons).

Brown-headed Cowbird.—After the CBC, 1–5 birds at feeders in Monroe, Winnebago, Dodge, and Jefferson Counties (m. obs.). Migration (?) on 21 February in Kenosha County (Hoffmann), and 23 February in Ozaukee County (Uttech).

Pine Grosbeak.—Only in northern counties; Douglas, 21 January–EOP; Bayfield and Ashland, TTP, maximum 15, 27 December; Price, TTP, maximum 12; Vilas, 17 December–25 February; Oneida, 24 January–21 February, maximum 7; Forest, 21 February, 1; Marathon, 9 January (m. obs.).

Purple Finch.—Thruout the state, except for the extreme southern counties and along Lake Michigan. Highest numbers (30–100) in northern counties.

House Finch.—Northward to these counties: Douglas, TTP in Poplar (LaValleys); Bayfield and Ashland, TTP, maximum 75, 4 December (Verch); Vilas, a male and 2 females at feeders, 14 December (Drings); Oconto, TTP, maximum 20, 26 December (Smiths); and Door, TTP (Lukes). This species was first reported in Wisconsin in the 1970s (Cutright, N.J., 1985, House Finch in Wisconsin: What does the future hold? *Passenger Pigeon* 47(2):63–66); now, approxi-

mately 20 years later, it has spread virtually thruout the state.

Red Crossbill.—After the CBC, records for these counties: Douglas, TTP; Bayfield and Ashland, TTP; Vilas, TTP; Oneida, 21 February, 15; Langlade, 24 January and 5 on 31 January; Shawano, 13 February, 20; and Portage, 1 February (m. obs.).

White-winged Crossbill.—After the CBC, reported only in February in Forest County, where Peterson found 6 on the 18th and Tessen found 5 on the 21st.

Common Redpoll.—Before the CBC, records for Douglas and Vilas Counties (LaValleys; Drings), and Portage County (Berner); after the CBC, records for Ashland County, 20 January (Robbins), and Oneida County, 21 February, 4 (Tessen).

Pine Siskin.—After the CBC, reported from 12 northern counties (m. obs.), and Monroe County where Kuecherer described it as "sporadic." Maximum numbers (20–109) mainly in the latter half of February (m. obs.).

American Goldfinch.—Generally numerous thruout the state, for example the Drings in Vilas County reported 50–100 at their feeders every day, and the most common finch. Northward to these counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door (m. obs.). Bowman in Oneida County noted an increase in mid-February.

Evening Grosbeak.—After the CBC, records for 12 northern counties (m. obs.). Hardy in Price County reported the highest number of birds—78.

House Sparrow.—Northward to these counties, where TTP: Douglas, Bayfield, Ashland, Vilas, Oconto, and Door (m. obs.).

Contributors

James Anderson and Steve Petznick (Mosquito Hill Nature Center), Philip Ashman, Jim Baughman, Scott Baughman, Dan Belter, Murray Berner, Grant C. Beutner, Homer C. Bishop, Marilyn Bontly, Paul W. Bowman, Jr., Marian Brager, David and Margaret Brasser, Paul Bruce, Kay Burcar, Nathan Carlsen, David Cederstrom, Jeff Dankert, Scott Diehl, Bob Domagalski, Pete and Carolyn Dring, Barbara Duerksen, Eric Epstein, Martin Evanson, Craig Faanes, Jim Frank, Alta Goff, Regina Goodhall, Larry Gregg, Karen Etter Hale, Marilyn R. Hale, Ellen Hansen, Maybelle Hardy, Judy Haseleu, Bill Hilsenhoff, Ron Hoffmann, Joe Hudick, Harriet Irwin, Robbye Johnson, Alex Kailing, James Knickelbine, Harold Koopman, Dennis Kuecherer, Roland and Eleanor Kuhn family, Kenneth I. Lange, Laura and Steve LaValley, Fred Lesher, Roy and Charlotte Lukes, Carol McDaniel, Audrey Morris, Michael J. Mossman, Don Nussbaum, Lynn Ott, Patricia A. Parsons, Mark Peterson, Bernard Pickering, Mary Jean Raile, Bill Reardon, Carol Richter, Sam Robbins, Thomas Schultz, Bruce Sedloff, Jerry and Karen Smith, Charles Sontag, Barbara R. Stover, Jean Strelka, Daryl D. Tessen, Steve Thiessen, Tom Uttech, Dick Verch, Thomas C. Wood, Norma Zehner, Thomas Ziebell.

Kenneth I. Lange
1530 East Street
Baraboo, WI 53913

"By the Wayside"

Observations of special interest include an observation of unusual feeding in Canada Geese, documentation of a warm weather Snowy Owl and the story behind Wisconsin's first Swainson's Warbler record.

Report of Canada Geese Feeding on American Toads

Canada Geese (*Branta canadensis*) feed on a variety of foods in different habitats and at different seasons. Favorite foods include wild rice; shoots and rootstocks of grasses, sedges, and aquatic plants; berries and seeds; and cultivated grains. Grain fields are often favorite feeding grounds, and one Wisconsin study of food habits confirmed that corn was the major food item of geese. Non-vegetable sources of food include insects, crustaceans, and small mollusks, which are especially preferred when they are attached to food plants; however, little animal food is taken. Here we report observations of Canada Geese feeding on newly metamorphosed American toads (*Bufo americanus americanus*).

Two adult Canada Geese were observed foraging near a small (<1 acre, max. depth 2.2 m), man-made pond in northwest Dane County, Wisconsin (T8N, R7E, Sec. 19) in June 1994. The geese nest nearby and routinely use the pond as a resting area; however, the present observation is the first of the geese feeding at the pond. Both geese were observed erratically "hunting and pecking" in the mowed grass adjacent to the pond's edge. After 15 minutes observation, it was learned that the geese were feeding on newly metamorphosed toadlets emigrating from the pond (toads emerge from the pond in large numbers over the course of a few days each year). The geese appeared to cue in on the movement of the hopping toads which were quickly picked up in the bill and swallowed whole in a single movement. The geese did not seem to be affected by the distasteful, alkaloid skin secretions of the toads.

Predation on amphibians by Canada Geese has not previously been documented. The present observations indicate that in at least some instances geese may opportunistically forage on abundant and easily acquired animal foods.—*Patricia Trochlell and Dreux J. Watermolen, Wisconsin Department of Natural Resources, P.O. Box 7921, Madison, WI 53707–7921.*

Snowy Owl

A mature (based on size) Snowy Owl was observed on June 21, 1995, 2 miles south of Bonduel, WI. This was at the Richard Fink farm in southeastern Shawano County. This area is an extremely open rolling agricultural setting. The bird perched on the back of a haywagon in a small grove of trees in the yard of the residence for at least ½ hour. Mrs. Fink took a very nice photo of the perched bird which later flew away. While it is rather common in some years to see Snowy Owls in this part of the county in the winter, I have not heard of many sightings later than April 1 in WI.—*James Robaidek, Wisconsin DNR, 647 Lakeland Road, Shawano, WI 54166.*

Warm Weather Snowy Owl

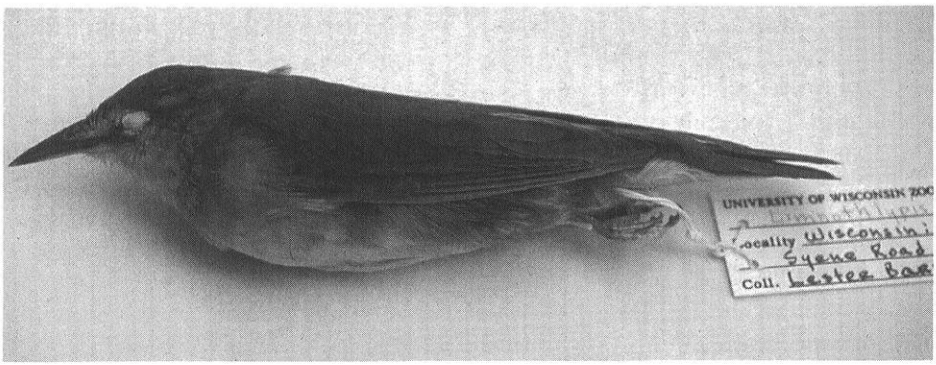
It was 7:00 A.M. on June 21, 1995, one of the hottest days of the summer. When I first saw the Snowy Owl, he was sitting on my barnyard fence. I drove a tractor and wagon less than ten feet of him, and later he sat on the back of my hay wagon and let us walk up to photograph him. At noon when I returned from rolling hay, he was still sitting in the shade on my wagon. This was right during the heat wave when temperatures reached the 90s. He sat with his wings hanging out from his sides, trying to keep cool. His eyes were open to just slits, but he was still watching me.

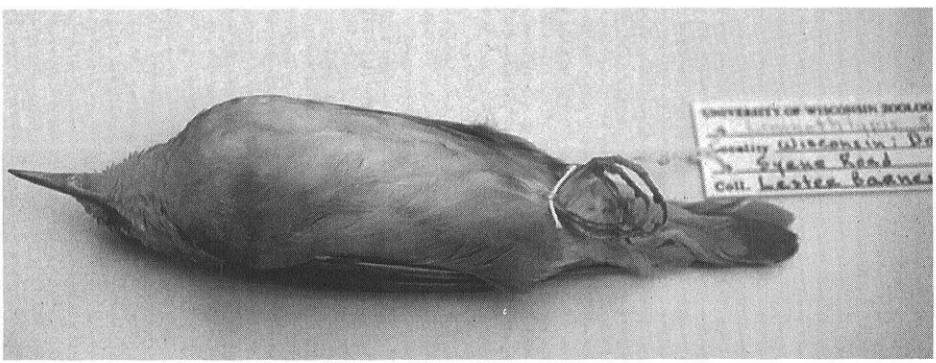
I decided I would try feeding him, so I checked all the sparrow nests in the machine shed with no luck. I then checked the martin house and was lucky to catch an adult male sparrow. Walking up to the wagon I pinched the sparrow's head and let it flutter on the wagon deck. The owl's eyes opened wide as he watched the sparrow flutter, and I walked away for a minute, returning just in time to see the sparrow being swallowed whole. The owl then flew down to a fence line and sat in the shade of some trees, allowing me the use of my wagon. We saw him again around 8:00 P.M. walking on the ground in the barnyard with his wings hanging out from his side in the heat. That is the last we saw of him.—*Richard Fink, RR1 Box 74, Bonduel, WI 54107.*

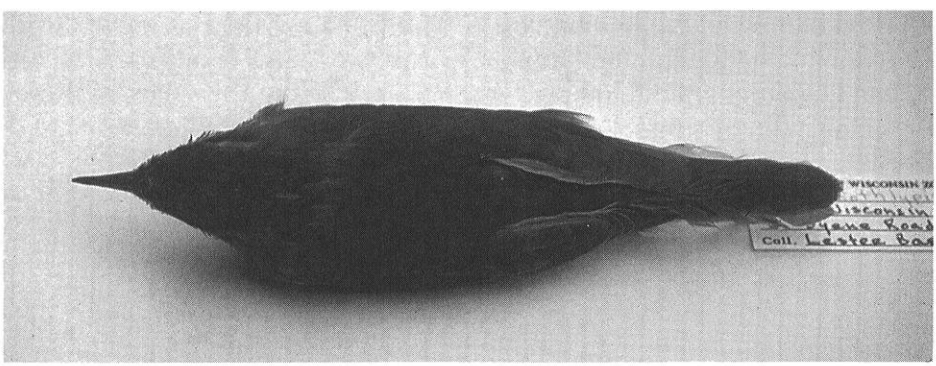
Wisconsin's First Swainson's Warbler

When Tom Schultz rediscovered a Wisconsin specimen of the Swainson's Warbler in the University of Wisconsin Zoological Museum in 1993, he added an important chapter to a story that began 17 years earlier. On May 9, 1976 Lester Barnes found a dead bird by his Fitchburg home just south of Madison. He did not recognize the specimen, so took it to his friend Frank Iwen, curator of birds at the University of Wisconsin Zoological Museum. Because Iwen was out of town, the skin was prepared and catalogued by an assistant. It was carefully labeled as a Swainson's Warbler, and placed in a drawer alongside another Swainson's Warbler skin from out-of-state. The record thereafter remained hidden in a museum drawer, and Mr. Barnes was unaware of the rarity of his find.

When I telephoned Mr. Barnes on July 23, 1995 to inquire about details, he expressed great surprise. He does


UNIVERSITY OF WISCONSIN ZOO
Locality Wisconsin
Coll. Lestes


Coll. Lestes


Coll. Lestes

not remember the occasion. He has dealt occasionally with birds flying into his picture window, and it seems probable that the Swainson's Warbler met such a fate. Not recognizing the identity of the bird, Barnes took the specimen to the Zoological Museum. The identification was made, but was never publicized.

Weather conditions were favorable for an "overshoot" at the time. Rockne Knuth, summarizing the spring 1976 season (*Pass. Pigeon* 39:188) quotes Eric Epstein as witnessing the arrival of a very strong cold front in the Milwaukee area on May 5 that sent thousands of birds in a southerly direction. Knuth continued: "A warming trend brought in a large movement of migrants May 8th, 9th and 10th." Vernon Kleen (*American Birds* 30:847) wrote of heavy bird concentrations over much of Illinois on May 8.

The normal summer range covers the southeastern states north to Missouri, southern Illinois, southern Indiana, southern Ohio, Maryland and Delaware. Accidental sightings of vagrants have come from Connecticut, Massachusetts and Nova Scotia.—*Sam Robbins, 14 S. Roby Road, Madison, WI 53705.*

Orioles at Nest *by Michael J. Riddet*

"By the Wayside"

Rare species observed include Eider spp., Barrow's Goldeneye, Purple Sandpiper, Franklin's Gull, Mew Gull, Thayer's Gull, Iceland Gull, Lesser Black-backed Gull, Great Black-backed Gull, House Wren, Varied Thrush and Clay-colored Sparrow.

EIDER (SPECIES) (*Somateria spp.*)

3 December 1994, Harrington Beach State Park—An impressive number and variety of waterfowl was present at Harrington Beach State Park. All three scoter species were present, with totals of 25 Black Scoter, 105 Surf Scoter, and 15 White-winged Scoter. While observing several Surf Scoter in a raft with Scaup, an obviously larger, brown individual was noted among them. The bird in question was obviously an Eider—a large, brown/tan duck with sloping head, large bill, brown sides. It was noticeably larger than the Scaup, and somewhat larger than the Surf Scoters. Due to the distance, there was no way to positively identify the species.—*Daryl D. Tessen, 3118 N. Oneida, Appleton, WI 54911.*

BARROW'S GOLDENEYE (*Bucephala islandica*)

9 December 1994, Vermond Park, Lake Michigan—I found this bird in a flock of 50–100 Common Goldeneyes. The first thing I noticed was that it looked like a very black goldeneye with white spots on the back, rather than white with black streaks. The head shape was different than Common Goldeneyes. It seemed like the feathering on the head was longer and more variable—the bird could express more shapes than the Common Goldeneyes. At first the shape was more swept back than Common Goldeneyes. It had a higher forehead and smaller bill. After more time and study I could determine the crescent shape of the white face spot, and also the black extension of the back which could divide the white breast from the white flank. The head was dark, the tail was dark, the back was dark (black) neck, breast and flanks were white.—*Tom Uttech, 4305 Hwy O, Saukville, WI 53080.*

11 December 1994, Vermond Park, Ozaukee Co.—I scoped the lake from the top of the bluff at Vermond and, although I could see lots of Common Goldeneye, some Scaup, Bufflehead and Red-breasted Mergansers I couldn't locate the Barrows. The

Barrow's Goldeneye had a black area which extended further down the bird between the body and neck area; oval rather than roundish shape of the facial spot, the white "spots" on the back—they appeared to be "spots" from that distance and a very elongated loon-like head shape.—*Marilyn Bontly, 9077 N. Meadowlark Ln., Bayside, WI 53217.*

Purple Sandpiper (*Calidris maritima*)

13 December 1994, North Point, City of Sheboygan—A single, dark, plump shorebird feeding along the rocky shoreline of North Point. Medium length bill with a slight decurve at the tip. Base of bill is orange while distal third is blackish. The head, back of neck, and upper breast was solid dark gray. A slight whitish smudge between the eye and the bill. The slightest hint of an eye ring. I must look extremely hard to notice it at all. Bold gray streaking on the pale breast and along the flanks. The streaking continued into the under-tail coverts. Legs were deep orange in color.—*Robert C. Domagalski, W140 N8508 Lilly Rd., Menomonee Falls, WI 53051.*

Franklin's Gull (*Larus pipixen*)

3 December 1994, Vernon Co.—The bird was with about 70 Ring-billed Gulls. I saw the black hood and bright, bold, broken eye ring. Its bill was dull red, as were the legs. Its back was dark gray, darker than the Ring-bills, and it flapped its wings a few times without flying; I saw the white wing tips with the black bar running across the white.—*Jeff Dankert, 4402 Markle Rd., Apt. 7, LaCrosse, WI 54601.*

Mew Gull (*Larus canus*)

13 December 1994, Port Washington Harbor—The Mew Gull was swimming in Lake Michigan in a flock of Ring-billed Gulls. The mantle was noticeably darker, the neck was very dark, the head and bill shapes were very noticeable. The head was rounder and the bill looked pointed rather than blunt-ended. The bill was duller in color than the Ring-billed and it appeared to have a very faint ring like area near its tip. The eyes were very dark and there were unusual dark streaks dropping down from under the eyes. The neck was a dark grey/brown which was formed by band-like streaks that were asymmetrical, more on the bird's left side than right. The marking on the head of the gull was quite similar to the Ring-billed and this area was almost separated with white from the dark neck. The primaries and tail were held in the air higher than the Ring-billed and the whole profile seemed longer, more graceful and swooping upward.—*Tom Uttech, 4305 Hwy O, Saukville, WI 53080.*

18 February 1995, Port Washington—The gull was noticed as being different from the Ring-billed Gulls as they all circled and landed somewhat in front of me. Clean white tail (noticed when it flew). Bill was noticeably smaller than Ring-billed's—straight shape, dull yellow color. Dark feathering around eyes and on top and back of head. The dark feathering on head was in the form of dusky smudges not thin streaks

like on some of the Ring-billed Gulls. Total length a little shorter than Ring-billed Gulls when standing. Legs more green than Ring-billed Gulls and appeared slightly shorter. Primaries looked the same as Ring-billeds. Mantle was a shade darker than Ring-billed Gulls. This also made the white of the trailing edge of the wing stand out more.– *Steve Thiessen, 1646 Johnson St., Stoughton, WI 53589.*

Thayer's Gull (*Larus thayeri*)

December 1994, January, February 1995, Port Washington Harbor, Ozaukee County—I have visited the harbor every day since December. Almost any day when the gull flock was in close enough to carefully study individual birds and I took enough time I could find one or two Thayer's Gulls. Judging by the streaking on the neck I think two of them have been present all winter. This description is of each bird and is a summary of each sighting. Head: a little rounder than Herring to much rounder (depending on how the feathers are being held). Bill: shorter and less angular than Herring, color is duller, less prominent. Neck: much heavier marked than most Herrings, but not nearly as much as some, on one bird, and quite white but with clear streaking on the other bird. Eye: dark and each have smudging—soft, greyish area around eye (like eye-shadow that has been smeared) (streaking on neck is browner than Herrings). Mantle: is slightly darker than Herring. Legs: are darker. Primary tips: are whiter, and more angular than Herring. Some spots look squarish, others have the white inner web showing causing a white streak to join the mirror. When the bird preens, or sits with its wings up in the air, you can clearly see the white underwings.—*Tom Uttech, 4305 Hwy O, Saukville, WI 53080.*

6 January 1995, Superior, WI, Douglas Co.—Scanning through gulls at Superior landfill, saw a bird that lacked the dark primary tips as in the Herring Gulls. The wing tips, as viewed from below while bird circled overhead, was gray, with no dark black visible from below. The bird was smaller than Herring Gulls. The bill was light colored. The field mark most easily observed (from beneath a flying bird) was the light wing tip. It appeared gray, with little contrast with the rest of white wing tip.—*Jeff Dankert, 4402 Markle Rd., Apt. 7, LaCrosse, WI 54601.*

6 January 1995, Landfill, Superior, WI, Douglas Co.—Among the 500 or so Herring Gulls circling overhead (very few landed because the bulldozers were stirring the brew) were maybe 6–8 large all white obvious Glaucous Gulls, larger than Herring Gulls. Thayer's was slightly smaller than the Herring Gulls, was presumably a winter adult plumage lacking pronounced black wing-tips below but showing dark primary (#s2,3,4,5) above, narrowly tipped with white.—*Fred Lesher, 509 Winona St., LaCrosse, WI 54603.*

Iceland Gull (*Larus glaucoides*)

6 January 1995, Superior, WI, Douglas Co., at Superior Landfill—Saw a white-winged gull that was smaller

than Herring Gull, much smaller than Herring, compared with Thayer's. The wing was entirely white below. The bill was dark, entirely. As it turned, in flight, we could see that its upper parts were very lightly mottled with a light brown.—*Jeff Dankert, 4402 Markle Rd., Apt. 7, LaCrosse, WI 54601.*

6 January 1995, Superior Landfill, Douglas Co.—There were several ghostly gulls among the 500 or so Herring Gulls circling overhead. Rather quickly, we picked out the giant-sized Glaucous Gulls, then concentrated several minutes on smaller white wing-tipped gulls, one of which appeared smaller than the other. The smaller Iceland lacked any black or dark wing-tips, above or below. In certain light and at certain angles, the under wings and even mantle were mottled buff or light tan. The bill was black and appeared stubby.—*Fred Lesher, 509 Winona St., LaCrosse, WI 54603.*

22 January 1995, Two Rivers, Manitowoc County—I flushed an all white gull from near the base of the pier at the Coast Guard Station in Two Rivers. This bird was approximately the same size as the many nearby Herring Gulls, and flew out about 50 yards before landing on the water. This bird was more buoyant and rode higher on the water than the nearby Herring Gulls. The plumage on this bird was completely white. The bill was about the same length as that of the Herring Gulls, but not as thick. The bill color was pink, except for a black tip. Leg color was not seen.—*Mark S. Peterson.*

Lesser Black-backed Gull (*Larus fuscus*)

1–9 December 1994, Tiedemann's pond, and Stricker's pond near Middleton, Dane County—The mantle was dark gray rather than black and wing tips were black with several white spots on the primaries. The legs and bill were yellow, however, the bill had the red spot on the lower mandible close to the distal end. The bill was thicker than the bills of Ring-billed Gulls, but not as large as the bill of a Herring Gull. The head, chest, and tail were mostly white and eye appeared quite dark with a slightly lighter color around the iris. The wings extended further past the tail than the Herring Gull while the body appeared slimmer than that of a Herring Gull. This bird was always seen among both Ring-billed and Herring Gulls for easy comparison.—*Kay Burcar, 5136 Enchanted Valley Rd., Cross Plains, WI 53528.*

Great Black-backed Gull (*Larus marinus*)

5 January 1995, Port Washington Harbor, Ozaukee County—There had been a strong wind the day before and the ensuing large waves had begun to break up the ice in the inner harbor. When I arrived on the 5th I saw that there was an unusual amount of activity in the harbor. Instead of sleeping, lounging and generally gossiping like the gulls usually do, many were flying and diving near the edge of the ice. There were many Common Mergansers actively diving in the same area. There was a large group of Herring Gulls sitting on the ice and there was a constant turnover

in this flock. One gull, an immature Great Black-backed Gull flew in, joined the feeding frenzy, stole a fish from some Herrings who were fighting over it, guarded it (attacking a female merganser that made the mistake of crawling onto the ice to approach the fish), played with it in its mouth, finally had it arranged to its satisfaction, swallowed it and then flew off, not to be seen again. Standing, it was very large, 20% larger than the Herring Gulls, it had a large thick aggressive looking black bill. The head was very whitish, it had a mottled breast and belly, heavily (contrasty) checkered mantle, black primaries, and pinkish legs.—*Tom Uttech, 4305 Hwy O, Saukville, WI 53080.*

House Wren (*Troglodytes aedon*)

17 December 1994, East of North Lake, Waukesha County—After looking at the bird with 8 power glasses it was noted that it was not a Goldfinch and that the tail was elevated and it had a slender narrow beak like a wren. I alerted my companions and we all had adequate time to inspect the bird and consult field guides. The bird was in full diffused sun remained on the small bush for several minutes both facing us and turning so that the side and face was observable. The bird held its tail erect during the entire time. The tail appeared to be equal to approximately 2/3rd the body length. It had a uniform light brown chest and belly with only slight stripping observable on the rump. A faint lighter eyestripe was noted as was the light eye-ring per the field guide. All observers felt the bird met the field marks for a House Wren. The only other possibility was the Winter Wren but color, size and tail length did not match this possibility.—*Alex Kailing, W330 N8275 W. Shore Dr., Hartland, WI 53029–9732.*

Varied Thrush (*Ixoreus naevius*)

4 February 1994—In the late fall of 1992 when we started putting out our usual black oil seeds for the birds I noticed a pair of birds by the feeder on the ground, whose body shape resembled a robin. I looked through the binoculars and saw much different markings. They were the size and shape of a robin with the thrush bill. I noticed the orange and black markings. The orange was much brighter than a robin's color and it had a black bib across the breast close to the neck area. It had the orange band from the top of the eye to the back of the head also orange wing bars and some orange feathers in the wings. They stayed all that winter. They left in the spring when the snow was gone. During the winter of 1993 and 1994 we did not see them. Then on 30 October 1994 we observed a single Varied Thrush. It has been at the feeders all winter. I was unable to identify it with our bird books until we got the field guide to western birds.—*Marilyn R. Hale, Rt. 1, Box 67, Couderay, WI 54828.*

Clay-colored Sparrow (*Spizella pallida*)

23 December 1994, Denmark, WI, Brown Co.—The bird was first observed in the company of House Sparrows but was noticeably smaller.

The bird was a rather drab sparrow with a clear, buffy breast. Legs were pink. The wings were brownish with two buffy wing bars. The back, rump, and tail were brownish. The top of the head was streaked brown and buff. The face had a lighter brown patch framed by a buff line above the eye and a lighter line extending back from the chin. The bird had a gray "collar" on nape. The bill was pinkish, upper mandible was darker.—*James Knickelbine, 6106 Hwy KB, Denmark, WI 54208.*

WSO Records Committee Report—Winter 1994–95

by Jim Frank

Thirteen documentations of rare birds were reviewed by the WSO Records Committee for the Winter 1994–95 season. The twelve accepted reports constitutes an acceptance rate of 92%.

Accepted

Eider (sp.)—
#94–046 *Ozaukee Co.;* Tessen, 3 December 1994.

In among a raft of Scaup and Surf Scoters, this dark brown duck was larger than the Scoters and much larger than the Scaup. The bill was described as large, giving the forehead a very sloped profile. The distance from the flock/individual precluded an identification down to species. This sighting continues a "streak" of 3 consecutive falls (Nov.-Dec.) in which an Eider (sp.) or King Eider has been found in the Sheboygan Co.-Ozaukee Co. shoreline of Lake Michigan.

Barrow's Goldeneye—
#94–047 *Ozaukee Co.;* Uttech, 9 December 1994; Bontly, 11 December 1994; Wood, 17 December 1994; Bruce, 7 January 1995; Domagalski, 7 January 1995.

During the 3 month winter visit to the Lake Michigan shoreline off Virmond Park, this male bird proved to be very elusive to many observers. Identification was based on the black of the back extending farther down the sides of the Barrow's relative to the Common Goldeneye. The white "extensions" from the flank into the black of a Common Goldeneye's back were white "spots" in the case of the Barrow's Goldeneye. Closer examination would then reveal a rounder to elongated head shape than the Common, an oval as opposed to round white facial spot, and a stubbier bill than the adjacent Common Goldeneyes. Some observers noted some need for caution while scanning the flocks for the Barrow's. Initial glimpses of molting male Common Goldeneyes could appear to have dark feathering extending down the flanks farther than customary on a breeding plumaged

Common Goldeneye and the white facial spot is less distinct in molt. Once the Barrow's was inspected though, it was clearly identifiable.

Purple Sandpiper—

#94–048 *Sheboygan Co.;* Domagalski, 13 December 1994.

This shorebird was described as plump, with a dark gray head and upper breast. The lower breast and flanks had gray streaking. A hint of a white eye ring was noted as well as a whitish smudge between the eye and bill. The slightly downturned bill had a dark tip, but an orange base. The legs were also a deep orange. The bird was observed at 25 yards on a rocky shoreline along Lake Michigan. Of note is the appearance of a Purple Sandpiper in 4 of the past 5 late falls/early winters in Sheboygan.

Mew Gull—

#94–049 *Ozaukee Co.;* Uttech, 13 December 1994; Thiessen, 18 February 1995; and Uttech again, 22 February 1995.

This small gull was noted to be slightly smaller then adjacent Ring-billed Gulls with a smaller, straighter, dull yellow bill. It lacked a black ring, but did have faint, darker coloring toward the tip of the bill. There was darker, smudgy feathering on back of the head and around the eyes. The legs were greener than the Ring-bills' legs and the mantle was a shade darker in gray coloration than the Ring-bills. The observers also noted the larger white primary "windows" than those of the Ring-bills. It should be mentioned that 2nd winter Mew Gulls carry a smudging on the beak that might be mistaken for a ring-bill's pattern if other characteristics of the Mew Gull are overlooked.

House Wren—

#94–050 *Waukesha Co.;* Kailing, 17 December 1994 (Oconomowoc Christmas Count)

This wren had an erect tail approximately 2/3 the length of its body (longer than that of a Winter Wren). The bird had a uniform light brown chest and belly, (lacking the rufous or rusty belly of a Winter Wren), and lacked the striping on the belly that a Winter Wren would have.

Clay-colored Sparrow—

#94–051 *Brown Co.;* Knickelbine, 23 December 1994. (Photographed)

This drab sparrow was smaller than the House Sparrows, exhibited an unmarked buffy breast, pink legs, a pinkish bill with a darker upper mandible, buffy wingbars, and a brownish rump. The crown was streaked buff and brown. The face had a brown patch on the cheek framed by a buff eyeline and chin line. Chipping Sparrows would have a crown of broken streaking instead of the solid brown of this Clay-colored. In addition, the Chipping has a gray rump. Both Chipping and Tree Sparrows would have rusty color to the crown that this bird lacked.

Harris' Hawk—

#94–027 *Sheboygan Co.;* Berger, Cowart, Mueller (photos), 25 October 1994.

The identity of this dark, medium

sized raptor with a white rump and rusty shoulders was not in doubt. Given that the bird was captured at the Cedar Grove Banding Station and photographed, the only concern left was the origin of the bird since the species is a favorite of falconers. The hands-on examination of this subadult bird found no leg band, no jesses, and no feather wear associated with captivity.

Also of importance in the final acceptance of this Harris' Hawk as a first state record were the reports of 8 extralimital Harris' Hawks from late October 1994 to early January 1995 from Missouri, Kansas, Colorado and Oklahoma. There apparently were other reports from east Texas and 10 or 11 October–November 1994 reports from California. This strongly suggests some sort of irruptive pattern in the population in 1994. Data being accumulated from the past 80 years seem to suggest this has been happening to a limited extent every 10–15 years??

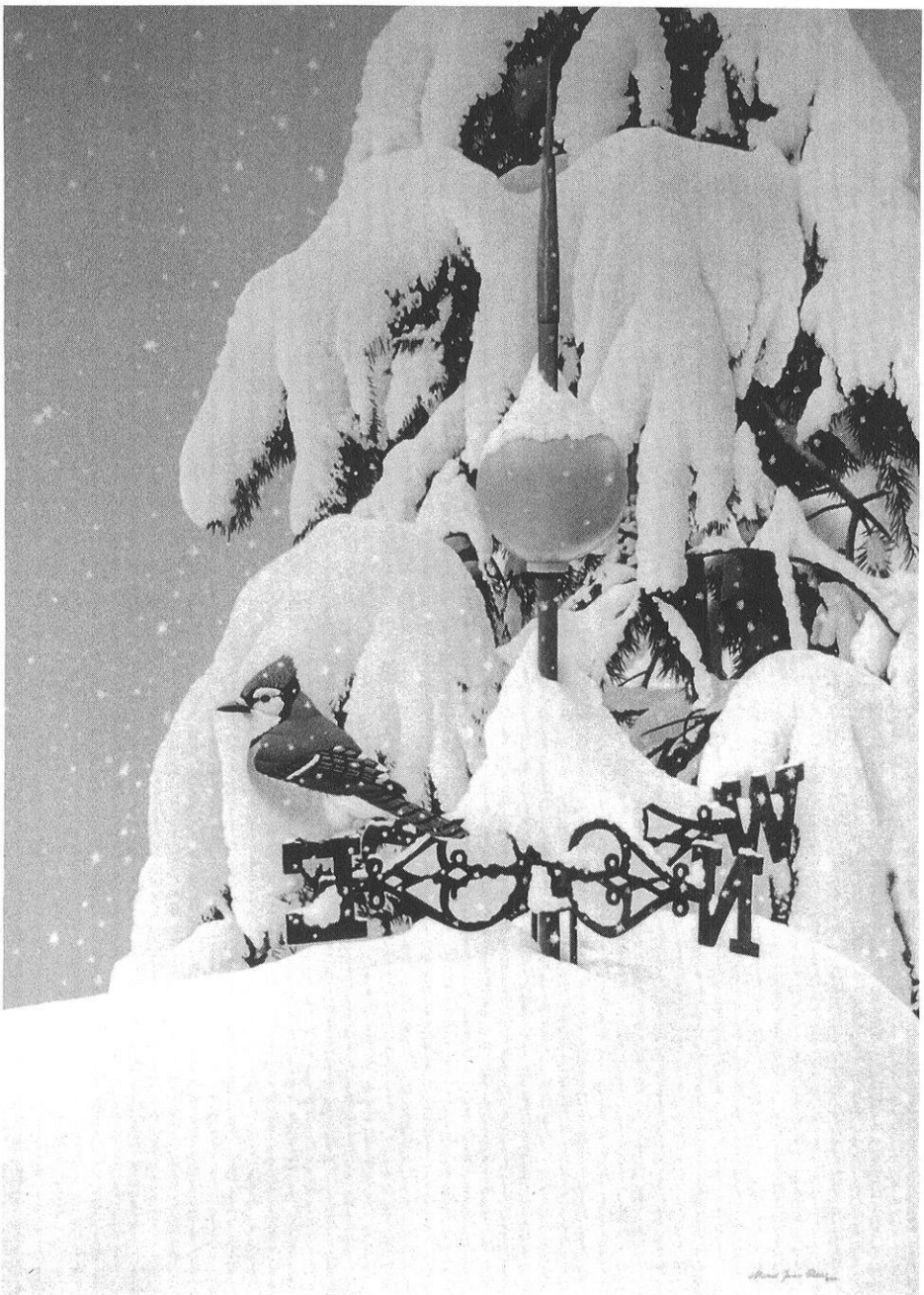
Not Accepted

Wheatear—

#95–001 *Ozaukee Co.;* 27 January 1995.

This very brief description mentioned only that the "6 inch long" birds (2) were observed at a thistle feeder. They had a bronze head and breast, white rump and black tail. The observer admits a very brief look was all that was had. Of course, the habitat for finding a wheatear would be expected to be an open area instead of a hanging feeder in a wooded, suburban landscape. Winter-plumaged goldfinches can have a bronzer than greenish head and body color. Without a longer look and more complete description, the identity of these birds remains uncertain.

Jim Frank
WSO Records Committee Chair



Bluejay '94 *by Michael J. Riddet*

ABOUT THE AUTHORS AND ARTISTS

James O. Evrard, a 25+ year member of WSO, is a wildlife research biologist with the Wisconsin DNR. His interests include wetland and grasslands birds and their habitats.

Jim Frank has been one of WSO's most active contributors to Seasonal Field-Notes. He now assists WSO by compiling and summarizing the annual May Day Counts, Big Day Counts and Migration Day Counts and is the Records Committee Chair. He is a veterinarian in Milwaukee with an interest in avian medicine.

Bettie Harriman is WSO's current president and one of Wisconsin's most active birders. She is coordinator of the Wisconsin Breeding Bird Atlas.

Kenneth I. Lange has been the Naturalist at Devil's Lake State Park since 1966. He has a master's degree from the University of Arizona. Ken has been a frequent contributor to WSO publications: as a field-note compiler and author of articles and the book, *Breeding Birds of the Baraboo Hills*. He formerly worked at the Smithsonian Institution's U.S. National Museum. He is the 1993 recipient of WSO's Silver Passenger Pigeon award.

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 lives in Boscobel.

Ann B. Swengel is the summer naturalist at Mirror Lake State Park. She is also interested in butterflies and serves as a vice-president of the North American Butterfly Association.

Scott R. Swengel is the assistant curator of birds at the International Crane Foundation. He has a B.A. in geology and a B.S. in systematics & ecology from the University of Kansas.

William E. Wheeler is a Wetland Wildlife Biologist with the Wisconsin DNR's Bureau of Research stationed at Horicon. He is currently researching giant Canada goose population

increases, movements and management strategies.

Dr. Philip C. Whitford is an Associate Professor of Biology at Capital University, Columbus, Ohio, teaching Ornithology, Animal Behavior and Vertebrate Biology, among other courses. He is a long time resident of Wisconsin and frequent contributor to The Passenger Pigeon, writing most often about albino Redtail Hawks and aspects of waterfowl behavior. He holds an MS from the College of Natural Resources, UW-Stevens Point, and a PhD from UW-Milwaukee.

Notices and Advertisements

Minutes of the Annual Business Meeting (May 20, 1995, Marinette, Wisconsin)

The 56th Annual Meeting of the Wisconsin Society for Ornithology was called to order at 1:33 P.M. Saturday May 20, 1995 by President Charles Sontag. This year's convention was held at the campus of the University of Wisconsin Center-Marinette in Marinette, Wisconsin. Approximately 90 people were present. The convention was hosted by the Chappe River Audubon Society, with Wendel Johnson as Chairman.

President Sontag thanked Wendel and the many volunteers for all the hard work they put in to create an excellent convention.

MINUTES for the May 21st, 1994 convention meeting held at Beloit College were printed in the Fall issue of the Pigeon and a copy was handed out at the entrance to this meeting. On motion by Daryl Tessen, seconded by Alex Kailing, those minutes were approved.

PRESIDENT Sontag took this time to recognize Bettie Harriman, Noel Cutright and Bob Howe on their work with organizing Atlas survey meetings throughout the state. Many volunteers who attended one of these meetings were supplied with their Atlas "care packages." It appears that the Atlas project is off to a great start.

VICE-PRESIDENT Bettie Harriman made a motion that the 1996 convention, which will be a "joint convention" with the Minnesota Ornithologist Union (MOU), be held on the Campus of the University of Wisconsin-Superior in Superior-Wisconsin. The motion was seconded by Carl Hayssen, a vote revealed unanimous support. Bettie also took this time to thank all those who entered the WSO logo contest. There were a total of eight entrants in the contest. These eight entrants were then thinned to four. Through a special insert in the April 1995 issue of the Badger Birder, the four finalists were displayed for the general membership to vote on. The four finalists included the "old" logo which had some improvements done by Tom Schultz. After further review the old logo won by a substantial margin. Finally, Bettie reminded us that if anyone would like a copy of the Speakers Bureau list they were to contact her. There are 39 speakers on this list. Bettie Harriman's address is 5188 Bittersweet Lane, Oshkosh, WI 54901 her phone number is 414-233-1973.

EDITOR: No Report.

ASSOCIATE EDITOR Daryl Tessen encouraged everyone to try to get their seasonal reports to him prior to the deadlines. This would create less confusion and eliminate a back log of data. He also mentioned that Big Day and May Day reports are due shortly and thanked everyone for their cooperation.

CONSERVATION: Noel Cutright asked if anyone would be interested in becoming the liaison between the WSO and BRAW (Bluebird Restora-

tion Association of Wisconsin). Noel also brought the avian action alert to the attention of the WSO. The alert was in conjunction with some congressional goings on that could drastically affect the way in which data about biological resources is gathered. The leadership of the U.S. Congress proposed to pay for the Contract for America by eliminating the National Biological Service (NBS) and most of our country's government backed avian research. Noel also handed out the ABA's Code of Ethics a short discussion about birding ethics followed. It was generally felt that the WSO should adapt it's own modified version of the ABA's code. This topic will be discussed often in the following months.

EDUCATION: No Report.

MEMBERSHIP: Alex Kailing reports that our membership continues to grow. He also encouraged all of us to try and find new members. A "new" undertaking by the WSO this year is the creation of a "Youth Membership" policy. It is currently in its infant stages of development, but it is widely held that a need for young people to become involved with our organization is important.

PUBLICITY: Bettie Harriman reports that WEPCO (Wisconsin Electric Power Company) has donated a felt board to the WSO. The board will be used whenever the WSO has an informational booth. Bettie continues to supply local newspapers with information about the Atlas project. A recap of the Grassland symposium held in early February in Oshkosh showed it was a great success. There are tentative plans for another symposium to be held sometime in early 1997.

RECORDS: No Report.

RESEARCH: No Report.

SCHOLARSHIPS AND GRANTS: Janine Polk supplied Bettie with the following list of recipients:

Steenbock Awards:

- Anne and Charlotte Kramer—*Do Weather Conditions Effect Eating Habits of a Select Group of Birds*
- Katie Rusch—*Vocalization of Ruby-throated Hummingbirds*

Nelson Award:

- Elaine Vincent—a project for *Establishment of Two Survey Methods for the Monitoring of Land Birds within a Northern White Cedar and Lowland Hardwood Forest*

WSO Scholarships:

- John P. Jacobs and Eugene A. Jacobs—*Wisconsin Red-shouldered Hawk Nesting Study*
- Joan Elias—*Effects of Forest Management on Breeding Birds of the Bad River Corridor*
- Lynn M. White—*Bobolinks Breeding Habitat: The Geographical Configuration and Arrangement of Bird Populations in Habitat Patches*
- Jim Woodford—*Determining the Effect of Dioxin on Osprey Productivity in Wisconsin*

BOOKSTORE: Margie Amato reported that sales for the WSO bookstore at the Grassland Symposium totaled $2579.70 less $128.00 for sales tax for an overall total of $2451.70. Margie also brought to our attention the increase in price of the daily checklist. The checklist will now cost $0.15/copy. The price increase was necessary to maintain a profit on their sales.

NOMINATIONS: This years nomination committee included Bob Triebensee from Plymouth, Ike Eckstein from Milwaukee, and Bob Howe from Green Bay. The following people were considered for WSO Board positions:

President: Bettie Harriman
Vice-President: Jim Anderson
Secretary: Scott Baughman
Treasurer: Alex Kailing
Editor: Becky Isenring

A motion by Daryl Tessen to accept the slate as presented was seconded by Sam Robbins. The slate was voted on and accepted.

Outgoing President Charles Sontag officially welcomed President Bettie Harriman and Vice-President Jim Anderson to their new positions.

The 1995 WSO Annual Business Meeting was adjourned at 2:24 P.M.

Respectively submitted: Scott Baughman, WSO Secretary

Annual Reports from officers and committee chairs follow.

Annual Reports (June 1994–May 1995)

President—Charles Sontag—The Society, with its many officers and committee chairpersons, represents the Society and its membership from many perspectives. These individuals generously provide their service in both time and energy. As I did last year with this report, I would like to take this opportunity to thank all for their dedicated service and shared talents that help make this Society truly meritorious.

The members of the Board conduct the day-to-day business of the Society which includes the publishing of the *Passenger Pigeon* and the *Badger Birder,* conducting the field trips, and running the WSO Book Store. In addition to these very obvious services of the Society, the Board has addressed other activities including:

- Initiation of the Wisconsin Breeding Bird Atlas
- Joint sponsorship of One Bird/Two Habitats with Sue Gilchrist
- Ballot for the WSO Logo
- Reexamination of the Membership categories including Corporate and Student Memberships

We hoped that these and the other services that have not been mentioned add to your birding experience and pleasure.

As the Society continues to grow, opportunities present themselves that will reshape and re-direct the destiny of the organization. We hope that you as Society members will accept these challenges and become a willing participant in this evolutionary process of the Society. Please do not hesitate to offer your talents when these opportunities to serve are revealed.

Vice President—Bettie Harriman—The Minnesota Ornithologists' Union (MOU) has invited WSO to a join them in Superior, WI on 7–9 June for our 1996 annual convention. MOU will be the hosting organization. The chair for the meeting will be Kim Risen. The location will be the UW-Superior campus.

The location for the 1997 annual convention will be Manitowoc, with Woodland Dunes Nature Center and the Aegolius Bird Club as the hosts.

The WSO Speakers' Bureau was published in October of 1994 and reprinted in February 1995. There are 39 speakers included in the listing. The publication was mailed to all nature organizations and nature centers in the state. If you would like a copy contact Bettie Harriman, 5188 Bittersweet Lane, Oshkosh, WI 54901, 414-233-1973.

Eight entries were received for the WSO Logo Contest. Three finalists

were selected by the WSO board of directors, and presented, along with the current logo for final vote to the membership in the April issue of the *Badger Birder*. The winning logo will be announced at the 1995 annual convention.

At the October meeting of the Atlas Steering Committee I was asked to serve as the director for the Wisconsin Breeding Bird Atlas (WBBA). This 5-year state-wide effort is well underway with about 1000 volunteers working as field observers for this first breeding season. About $20,000 have been donated to the project by WSO members and other interested individuals and foundations. The WBBA has received a $25,000 2-to-1 matching grant from the National Fish and Wildlife Foundation. As we begin our initial season of field work the WBBA seems to be doing very well. We will have a much better picture of exactly how well after the data from this first breeding season come in this fall. The Steering Committee is very grateful to each of you for your support in time and money for this huge research project.

These two years as vice president have been exciting and interesting, and I thank the membership for giving me the privilege of serving WSO in this capacity.

Treasurer—Alex Kailing—

STATEMENT OF REVENUE & EXPENSES:

	1993 TOTAL	1994 TOTAL	1994 BUDGET
REVENUE			
BOOKSTORE	5,048.11	5,476.25	4,000.00
SLIDES			
DIVIDENDS			
INTEREST	1,725.99	1,991.24	1,800.00
INVESTMENTS			
CONVENTION	1,856.47	2,421.84	500.00
PIGEON			
ADVERTISING			
BACK COPIES	65.00	5.00	
SUBSCRIP.	735.00	538.00	800.00
MEMBERSHIP			
DUES	20,927.85	22,132.03	21,000.00
LIFE	1,775.04	1,050.00	1,250.00
MBR LIST		13.00	
CONTRIBUTIONS			
ENDOWMENT	516.00	932.00	600.00
SCHOLARSHIP	1,511.69	3,304.35	1,800.00
HONEY CREEK	897.00	2,024.00	1,200.00
BIRDATHON	1,738.98	2,618.03	2,000.00
MEMORIALS		100.00	
BEQUESTS	15,000.00	100.00	
SPECIAL PROJECTS			
ANIV. PRINT	240.00	60.00	
TOURS	200.00	200.00	200.00
WEEB GRANT		20,000.00	
BIRDERS DIGEST		122.91	
SEMINAR		190.00	
ATLAS		6,807.58	
TOTAL REVENUE	**$52,917.09**	**$70,086.23**	**$35,400.00**

	1993 TOTAL	1994 TOTAL	1994 BUDGET
EXPENSES			
ADMINISTRATION	2,428.45	30.00	250.00
ART PRINT	16.83		
ASSOC. EDITOR	340.00	462.75	350.00
AWARDS	100.99	327.32	100.00
BADGER BIRDER			
PRINTING	3,215.86	4,232.59	4,000.00
MAILING	1,651.05	1,708.11	1,125.00
MISC.			
CONVENTION	544.80	3,034.88	600.00
BOOKSTORE			
INSURANCE	193.00	192.00	200.00
MISC.		2,325.20	
EDUCATION	850.54	597.74	1,000.00
FIELD TRIPS	247.47	502.69	250.00
HONEY CREEK			
TAXES	2,860.02	3,226.42	3,200.00
INSURANCE	1,039.00	1,072.00	1,000.00
UPKEEP	251.59	228.15	300.00
HOT LINE	28.79	120.23	
MEMBERSHIP			
MISC.	1,916.02	1,891.72	2,000.00
PIGEON			
PRINTING	21,154.65	12,647.07	13,000.00
MAILING	2,183.12	1,268.14	2,250.00
MISC.	1,088.39	349.48	1,250.00
PRESIDENT			50.00
PUBLICITY	283.12	737.61	500.00
BIRDATHON	97.90	116.79	50.00
RECORDS	46.38	115.51	50.00
RESEARCH	107.09		
GRANTS	2,000.00	1,650.00	2,100.00
SECRETARY	16.50	50.00	50.00
MISC PRINTING	1,433.28	893.45	1,500.00
TREASURER	66.66	73.26	75.00
SPECIAL PROJECTS		285.00	2,000.00
HABITAT		20,014.16	
ATLAS		4,388.92	
TOTAL EXPENSES	**$45,424.54**	**$62,764.89**	**$37,500.00**

BALANCE SHEET—AS OF 12/31:

	12/31/93	12/31/94
LIQUID ASSETS		
CASH	1,062.13	3,460.01
SAVINGS ACCOUNTS		
GENERAL SAVINGS	45,003.59	40,713.95
ENDOWMENT	12,734.75	15,140.27
ATLAS		6,807.58
INVESTMENTS		
ENDOWMENT [TOTAL FUND]	25,002.25	25,002.25
SAVINGS [AMER.ADJ RATE]	6,000.00	6,000.00
INVENTORIES		
BOOKSTORE		
CASH	3,110.41	3,134.56
INVENTORY	32,663.48	31,124.11
SLIDES		
CASH	3,351.63	3,895.13
INVENTORY	3,134.49	3,017.80

	12/31/93	12/31/94
MEMBERSHIP		
CASH		
INVENTORY		
FIXED ASSETS		
EQUIPMENT	674.92	379.98
LAND & BUILDINGS		
PRAIRIE CHICKEN	1,491.39	1,491.39
HONEY CREEK		
LAND	21,475.86	21,475.86
BUILDINGS	8,927.88	8,927.88
TOTAL CURRENT ASSETS	**$164,632.78**	**$170,570.77**

HISTORIC ASSET GROWTH:

1992	$159,690	1986	107,333
1991	151,170	1985	100,838
1990	142,721	1984	98,773
1989	128,226	1983	103,132
1988	125,697	1982	95,806
1987	121,107	1981	82,176

SPECIAL FUND TOTALS: [As of 12/31]

	1993	1994
ENDOWMENT FUND	37,737.00	40,642.52
SCHOLARSHIP/ GRANT	31,870.17	36,168.80
HONEY CREEK FUND	764.40	1,051.24
BARABOO HILLS FUND	1,227.04	129.40
ATLAS		9,918.66

Additional comments:

- The Society made an allocation of $7,500 for initial funding of the ATLAS project. Additional funding of $6,807.58 was received from individuals, organizations, businesses & foundations in 1994. [In 1995 up to May 1 an additional $12,086.22 has been donated and the ATLAS program has received a matching grant from the Fish & Wildlife Foundation that contributes $1 for every $2 donated up to an additional $25,000.]
- The Society received a $20,000 grant from the Wisconsin Environmental Education Board [WEEB] to conduct teacher training throughout the state on the "One Bird/Two Habitats" secondary education course developed by Susan Gilchrist of the DNR. The funds were transferred to the University system to implement the training classes.
- Increased 1994 Badger Birder costs due to increasing paper costs and additional pages [18% increase].
- Passenger Pigeon costs are down due to only 3 issues in 1994 vs 6 issues in 1993.
- WSO again hosted refreshments after a program at the Leigh Yawkee Woodson Art Museum in Wausau as part of the "Birds in Art" series.
- Misc Printing expenses included Membership brochures & Checklists.
- Honey Creek Fund income comes from the annual Birdathon/Bandathon, memorials and specific contributions, and is used to offset the cost of maintaining the facility. All 1994 expenses were covered by the Fund with a remaining positive balance of $1,051.24.
- A change in Wisconsin statutes effective 1/1/95 allowed WSO to request tax exempt status on all of our Honey Creek Lands other than the Nature Center. This will become effective with the taxes paid in 1996. The WSO Board passed a motion to make a voluntary con-

tinuing donation to the Town of Honey Creek in recognition of the road, police & fire services provided. [Based on 1994 property taxes this exemption will reduce our tax expenditures by approximately $2,100.]

Passenger Pigeon Editor—Becky Isenring—Volume 56 of *The Passenger Pigeon* published 336 pages (compared to 408 pages in Volume 55). Nine research articles were contributed. Regularly featured articles such as Christmas Count reports, Big Day Count results, and seasonal field notes, etc., represented 37% of the pages published.

The editorial staff remained the same as last year. Typesetting and printing continued under the same arrangement.

The Fall issue of Volume 56 was published with no articles other than the seasonal field notes because there had been a shortage of submissions. Volume 57 is off to a better start with plans to use the Summer issue to feature grasslands. The papers will include many of those presented at the Grassland Birds Symposium in February.

As always, I welcome feedback on the Pigeon. I also urge members to submit work to be published, especially papers presented at the Convention and results of studies done which were partially funded by WSO scholarships.

Associate Editor—Daryl Tessen—During the past year the traditional November mailing was made that included the 1995 seasonal report forms plus Christmas, Big Day, and May Day count forms. This totaled about 135. All seasonal and count sightings were received, analyzed, and forwarded to the seasonal and count editors for inclusion in the *Passenger Pigeon.* In addition, significant sightings (rare, unusual/record dates) were forwarded to the records committee for their analysis. Wisconsin's seasonal sightings were prepared for inclusion in the Audubon's *Field Notes.*

A **BIG THANK YOU** to the four seasonal *Passenger Pigeon* editors and the Christmas and Big Day/May Day editors who do an outstanding and time consuming job of preparing their data for print.

Badger Birder Editor—Jennifer Nieland—Since assuming my duties as *Badger Birder* editor I have only worked on two issues. The first issue was a great learning experience and has given me enthusiasm for future issues. Thanks to Randy Hoffman who has gotten the *Birder* to its current format, his help has certainly made the transition a comfortable one. My hope is that I can continue in Randy's footsteps by producing a newsletter that fulfills the wishes of the membership. There is plenty of experience and history of the WSO that I will need to become familiar with as I continue as Editor, and I am looking to the membership and board members to guide and coach me along the way.

There are two things I would like to encourage greater membership participation in regarding *The Badger Birder.* Comments on current format and content of the newsletter are always welcome, whether positive or negative. Feedback from the members is the only way I will know how to continue with the newsletter. Secondly, I am looking for more articles,

stories, poems, puzzles, or (simple) artwork to put in the *Birder*. Whether it's a hand written note, through a phone call, or on a computer disk, sharing your "bird news" is very important to everyone in the WSO. I look forward to working with and meeting many of the members in the future.

Conservation—Noel Cutright—As chair of the Conservation Committee I have:

- Attended all board meetings
- Prepared "Conservation Clips" articles for the *Badger Birder*
- Served on the Steering Committee for Wisconsin Breeding Bird Atlas
- Submitted comments to WDNR on several issues, including endangered and threatened species list revision, Turtle-Flambeau Master Plan, and master planning process
- At the federal level, supported Conservation Reserve Program renewal, Endangered Species Act reauthorization, wetland preservation, and maintaining the Biological Service through letter writing
- Attended press conference for unveiling of Wisconsin's Watchable Wildlife Guide that WSO helped sponsor
- Assisted with several WSO publicity activities, including display donations
- Completed 11th Annual Honey Creek Birdathon/Bandathon
- Presented bird talks to several audiences around the state where WSO always received special attention
- Served as Education/Communications Chair for the Wisconsin Working Group for Neotropical Migrants as part of Partners in Flight
- Supported development and publicity of the environmental curriculum: *One Bird—Two Habitats*
- Will attend WDNR Advisory Group meeting on fish hatchery predation issue on May 26
- Represent WSO as a liaison on the Bluebird Restoration Association of Wisconsin board. Are any WSO members interested in serving the Society in this capacity?

Membership—Alex Kailing

MEMBERSHIP STATUS: [AS OF MAY 1ST]

CATEGORY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
SENIOR	36	93	94	74	62	61	63	50	48	49	46
REGULAR	590	543	502	507	598	601	598	616	610	672	679
FAMILY	324	243	260	303	318	349	376	346	321	349	358
SUSTAIN	45	38	45	74	73	105	112	91	88	84	86
1/4 LIFE	2	2	0	5	10	14	5	6	10	7	9
LIFE	61	61	68	68	69	71	82	86	87	93	98
PATRON	8	8	7	7	6	6	6	6	6	6	6
HONORARY	8	8	7	7	7	8	8	7	7	7	6
BOARD	3	4	4	4	5	5	4	2	2	4	3
LIBRARY	60	58	58	55	48	45	48	46	40	44	47
EXCHANGE	47	47	46	42	43	44	43	36	40	41	43
TOTAL	1183	1105	1091	1145	1239	1309	1346	1292	1259	1356	1381
DECEASED	3	2	3	5	4	2	4	5	6	9	5
NON RENEW	105	166	141	110	99	119	130	189	237	172	177
LIBRARY DROP	7	3	3	2	7	5	2	2	3	1	0

NEW MEMBERS: [New members for the calendar year]

1990	1991	1992	1993	1994
140	171	176	180	163

The ATLAS project can be expected to add quite a few new members in 1995.

Publicity—Bettie Harriman—Notices of the WSO field trips continue to be sent to local newspapers. If any members see these notices, I would appreciate a copy for the files. The January Bald Eagle trip to Prairie du Sac received some very good coverage in the Baraboo News-Republic after the reporter joined the field trip that day, and there was excellent pictorial coverage in the Milwaukee Journal of the March Milwaukee Lakeshore trip.

Press releases concerning the Steenbock and WSO Scholarship winners were sent to several newspapers in the state, and an article about the winners and their projects was published in the *Badger Birder.*

Several WSO membership brochure displays were placed in new bird stores around the state, and membership brochures were distributed as requested to members who keep our displays filled. Six more displays have been made and three are still available for use. Please contact Bettie Harriman, 5188 Bittersweet Lane, Oshkosh, WI 54901, 414-233-1973 for new displays or more brochures.

Wisconsin Electric Power Company generously donated two feltboard type displays for WSO's use, and I have created a couple of displays for these new boards.

The 1994 "Birds in Art" event which WSO co-sponsored with the Leigh Yawkey Woodson Museum was a lecture by William J. Stott, Jr. on neotropical birds and conservation.

WSO has received a great deal of publicity this year due to the Wisconsin Breeding Bird Atlas. Dozens of newspapers around the state have carried articles about the Atlas project and mentioned WSO as the sponsoring organization. In addition, there have been radio and TV announcements about the Atlas. The WSO and Atlas displays were provided at the annual meetings of the Bluebird Restoration Association of Wisconsin (BRAW), The Nature Conservancy (TNC), and the Wisconsin Wildlife Rehabilitators Association, as well as at the Wisconsin Neotropical Migrant Birds Meeting, and the TNC Stewardship Meeting. Membership brochures have been sent to the many individuals who have signed on as Atlas field observers, but are not WSO members.

WSO sponsored the Grassland Birds Symposium on February 11, 1995 in Oshkosh in conjunction with the annual meeting of the Wisconsin Wildlife Society. This event was cosponsored by the Madison Audubon Society. This presentation was attended by about 300 persons from a number of different organizations interested in grasslands and birds. It gave WSO an excellent opportunity to reach a new audience.

In addition, I have given several talks about birds, always including information about WSO. I have attended all the WSO board meetings, and am serving as the Director of the Wisconsin Breeding Bird Atlas.

Records—Jim Frank—The WSO Records Committee consisting of Jim Frank, Tom Schultz, Mark Peterson, Robbye Johnson, and Randy Hoffman examined 87 records of 34 species in 1994. The 71 accepted documentations is an acceptance rate of 81.6% of the records submitted for evaluation. Three new species were added to the state list—Townsend's Warbler, Swainson's Warbler, and Brambling. Complete information on the committee's work appeared in the *Passenger Pigeon* Vol. 56 Nos. 3 & 4, and Vol. 57 Nos. 1 & 2.

SEASON	RECORDS EXAMINED	ACCEPTED	NOT ACCEPTED
WINTER 1994	19	14	5
SPRING 1994	37	33	4
SUMMER 1994	4	3	1
FALL 1994	27	21	5 (+1 DEFERRED)
TOTAL 1994	87	71	15

Research—Robert Howe—The primary focus of my activities during 1994–95 has been participating in the development of the Wisconsin Breeding Bird Atlas. The Atlas, of course, is up and running and appears to be on its way toward a major chapter in the history of ornithological research in Wisconsin–one that is involving birders from across the state and with all levels of experience. My role has been to serve as an active member of the Atlas Steering Committee and to work on data management aspects of the project. I also worked with Alex Kailing, Bettie Harriman, and Noel Cutright in authoring a successful application for funding of the Atlas from the National Fish and Wildlife Foundation.

Related to the Atlas, I have worked with Dean Terry O'Grady of the University of Wisconsin-Green Bay and the WSO Board of Directors to establish a data management center for the WBBA. This room, adjacent to the Richter Museum of Natural History in the Lab Sciences Building of the University of Wisconsin-Green Bay, will serve as a storage location for WSO archives files upon completion of the Atlas. Construction of the room is expected to begin during early summer, 1995, pending approval of the UW System Board of Regents.

I also have been involved with efforts to standardize methods for monitoring bird populations by point counts. I participated in a conference during April sponsored by the National Resources Research Institute in Duluth, Minnesota, attended by representatives from Minnesota, Michigan, Wisconsin, and Ontario. The goal of this group is to establish clear, standardized methods which can be used by public agencies, nature centers, and other conservation groups to monitor breeding bird populations at specific localities. A manuscript outlining these methods is being drafted for publication in the *Passenger Pigeon* and other state ornithological journals.

Bookstore—Mark and Margie Amato—The WSO Bookstore realized $13,967.35 in total receipts for calendar year 1994. Of that amount $4021.25 was from WSO publications. The WSO publications sold include:

	Number	Dollars
Bird Haunts	247	$3,130.76
Baraboo Hills	16	111.20
Apostle Islands	13	8.70
Ducks at a Distance	184	82.30
WI Birds, Checklist with graphs	449	212.45
Checklists, Single Day	8733	343.84
Checklists, Multi Day	304	12.00
WSO Anniversary Prints	10	120.00

We have two new WI Bird Checklists now available—a single day and a multi day version. Currently they are $0.05 each. Due to high cost of printing the price of the checklist will go up in the next catalog. The WSO anniversary print inventory has been transferred to and will be offered through the Bookstore.

We have a number of new retail outlets for our WSO publications: Wild Birds Unlimited-Eau Claire, Wild Bird Crossing in West Bend, and Wild Bird Center in Germantown. Our publications continue to be sold at other Wild Birds Unlimited franchises, Schlitz Audubon, Wild Bird Marketplace, Conkey's Bookstore, ABA, and several nature centers (Riveredge, Retzer, Friends of Terre Kohler).

Goals for 1995–1996

- Provide references for the WSO Atlas Project
- Design and print a new Bookstore catalog

Some WSO publications may see an increase in price (e.g., checklists), postage and handling costs may increase some due to new postal rates.

We hope to continue to provide quality service. Any comments or requests for orders can be sent to: WSO Bookstore, 1516 Fiesta Lane, Mequon, WI 53092–5728, or phone 414-241-5165.

UNITED STATES POSTAL SERVICE™

Statement of Ownership, Management, and Circulation

(Required by 39 U.S.C. 3685)

1. Publication Title	2. Publication No.	3. Filing Date
The Passenger Pigeon	4 2 - 2 8 2 0	9/26/95
4. Issue Frequency	**5. No. of Issues Published Annually**	**6. Annual Subscription Price**
Quarterly	4	$15 - $18

7. Complete Mailing Address of Known Office of Publication *(Street, City, County, State, and ZIP+4) (Not Printer)*

W330 N8275 W Shore Dr. Hartland, WI 53029-9732

8. Complete Mailing Address of Headquarters or General Business Office of Publisher *(Not Printer)*

W330 N8275 W Shore Dr. Hartland, WI 53029-9732

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor *(Do Not Leave Blank)*

Publisher *(Name and Complete Mailing Address)*

Wisconsin Society for Ornithology, Inc.
W330 N8275 W Shore Dr. Hartland, WI 53029-9732

Editor *(Name and Complete Mailing Address)*

Rebecca S Isenring
6869 Taylor Rd. Sauk City, WI 53583

Managing Editor *(Name and Complete Mailing Address)*

None

10. Owner *(If owned by a corporation, its name and address must be stated and also immediately thereafter the names and addresses of stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Do Not Leave Blank.)*

Full Name	Complete Mailing Address
Wisconsin Society for Ornithology, Inc.	W330 N8275 W Shore Dr. Hartland, WI 53029-9732

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check here. ☒ None

Full Name	Complete Mailing Address

12. For completion by nonprofit organizations authorized to mail at special rates. The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: *(Check one)*

☒ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months
(If changed, publisher must submit explanation of change with this statement)

PS Form **3526**, October 1994 *(See Instructions on Reverse)*

13. Publication Name	14. Issue Date for Circulation Data Below	
The Passenger Pigeon	June 16, 1995	
15. Extent and Nature of Circulation	**Average No. Copies Each Issue During Preceding 12 Months**	**Actual No. Copies of Single Issue Published Nearest to Filing Date**
a. Total No. Copies *(Net Press Run)*	1638	1693
b. Paid and/or Requested Circulation (1) Sales Through Dealers and Carriers, Street Vendors, and Counter Sales *(Not Mailed)*	0	0
(2) Paid or Requested Mail Subscriptions *(Include Advertisers' Proof Copies/Exchange Copies)*	1452	1382
c. Total Paid and/or Requested Circulation *(Sum of 15b(1) and 15b(2))*	1452	1382
d. Free Distribution by Mail *(Samples, Complimentary, and Other Free)*	21	21
e. Free Distribution Outside the Mail *(Carriers or Other Means)*	48	95
f. Total Free Distribution *(Sum of 15d and 15e)*	69	116
g. Total Distribution *(Sum of 15c and 15f)*	1521	1498
h. Copies Not Distributed (1) Office Use, Leftovers, Spoiled	117	195
(2) Return from News Agents	0	0
i. Total *(Sum of 15g, 15h(1), and 15h(2))*	1638	1693
Percent Paid and/or Requested Circulation *(15c / 15g x 100)*	95.5%	92.3%

16. This Statement of Ownership will be printed in the Vol 57#3 issue of this publication. ☐ Check box if not required to publish.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner — Date

Membership/Treasurer — 9/26/95

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions *(including fines and imprisonment)* and/or civil sanctions *(including multiple damages and civil penalties)*.

Instructions to Publishers

1. Complete and file one copy of this form with your postmaster on or before October 1, annually. Keep a copy of the completed form for your records.
2. Include in items 10 and 11, in cases where the stockholder or security holder is a trustee, the name of the person or corporation for whom the trustee is acting. Also include the names and addresses of individuals who are stockholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 11, if none, check box. Use blank sheets if more space is required.
3. Be sure to furnish all information called for in item 15, regarding circulation. Free circulation must be shown in items 15d, e, and f.
4. If the publication had second-class authorization as a general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or the first printed issue after October, if the publication is not published during October.
5. In item 16, indicate date of the issue in which this Statement of Ownership will be printed.
6. Item 17 must be signed.

Failure to file or publish a statement of ownership may lead to suspension of second-class authorization.

PS Form **3526**, October 1994 *(Reverse)*

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 (1995–96)

President*: Bettie R. Harriman, 5188 Bittersweet Lane, Oshkosh, WI 54901 (414-233-1973)

Vice President*: James S. Anderson, Mosquito Hill Nature Center, N3880 Rogers Road, New London, WI 54961 (h. 414-982-4257, w. 414-779-6433)

Secretary*: Scott Baughman, 133 Park Ave., Sheboygan, WI 53081

Treasurer*: Alex F. Kailing, W330 N8275 West Shore Drive, Hartland, WI 53029 (414-966-1072)

Editor*: Rebecca S. Isenring, 6869 Taylor Road, Sauk City, WI 53583 (608-643-6906)

COMMITTEE CHAIRS (1994–95)

Annual Convention (1996): Kim Risen, 5756 Brunswick Ave. N., Crystal, MN 55428 (613-535-2472)

Associate Editor*: Daryl D. Tessen, 3118 North Oneida St., Appleton, WI 54911 (414-735-9903)

Awards*: Mary F. Donald, 6918 North Belmont Lane, Milwaukee, WI 53217 (414-352-8940)

Badger Birder*: Jennifer Nieland, 1066 Harwood Ave. #2, Green Bay, WI 54313 (414-434-1229)

Book Store*: Mark and Margie Amato, 1516 West Fiesta Lane, Mequon, WI 53092 (414-241-5165)

Conservation*: Noel J. Cutright, 3352 Knollwood Road, West Bend, WI 53095 (h. 414-675-2443, w. 414-221-2179)

Education*: William K. Volkert, W996 Birchwood Drive, Campbellsport, WI 53010 (414-387-7877)

Field Trips*: Thomas R. Schultz, N6104 Honeysuckle Lane, Green Lake, WI 54941 (414-294-3021) and Jeffrey L. Baughman, W8985 County Hwy SS, Adell, WI 53001 (414-626-4713)

File Keeper: Thomas C. Erdman, Richter Museum of Natural History, UW-Green Bay, Green Bay, WI 54311-7001

Honey Creek: Rebecca S. Isenring, 6869 Taylor Road, Sauk City, WI 53583 and Kenneth I. Lange, Devil's Lake State Park, Baraboo, WI 53913

Hotline (414-352-3857): Brian Boldt, 1832 Jeffrey Ln., Waukesha, WI 53186 and Mark Korducki, 4410 South 21st St., Milwaukee, WI 53221 (414-282-7058)

Legal Counsel*: Carlo A. Balistrieri, P.O. Box 327, Ashippun, WI 53066 (414-474-7578)

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*: Bettie R. Harriman, 5188 Bittersweet Lane, Oshkosh, WI 54901 (414-233-1973)

Records*: Jim Frank, 4339 West Laverna Avenue, Mequon, WI 53092 (414-242-2443)

Research*: Robert W. Howe, Department of Natural and Applied Sciences, University of Wisconsin, Green Bay, WI 54311 (414-465-8263/2272)

Records Committee Archivist: John H. Idzikowski, 2558 S. Delaware Avenue, Milwaukee, WI 53207 (h. 414-744-4818, w. 414-229-6274)

Scholarships and Grants*: Janine Polk, 1407 Frederic, Eau Claire, WI 54701 (715-839-9265)

Youth Education Coordinator: Stephen J. Kupcho, 9344 West Goodrich Ave., Milwaukee, WI 53224 (414-354-0948)

---

*Members of the Board of Directors

CONTENTS

Volume 57 Fall 1995 Number 3